General Services Agency
Yolo County, California

Final Report

Yolo County Airport
Woodland, California

Airport Master Plan

Prepared by:

P&D Aviation

A Division of P & D Consultants, Inc.

Oakland, California

May 1996
(Revised May 2, 1998)

County of Yolo , California
General Services Agency

FINAL REPORT
YOLO COUNTY AIRPORT

MASTER PLAN REPORT

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SECTION 1
EXECUTIVE SUMMARY

SECTION 1
EXECUTIVE SUMMARY

This document describes the findings and conclusions of an Airport Master Planning Study for Yolo County Airport. The purpose of the study was to provide a plan for the orderly development of new facilities and other improvements at the airport to meet the community's air service needs to the year 2015. Yolo County Airport, owned and operated by the County of Yolo, is located 5 miles west of Davis and about 20 miles west of Sacramento. The important findings and conclusions of the study are summarized below.

This Executive Summary is organized in the same order as the remaining sections of this document. Therefore, if further information about a specific subject is desired, the reader can turn to the appropriate section for the details. Appendix A, *Glossary and Abbreviations*, contain definitions of acronyms and other aviation terms used in this report.

A. PURPOSE OF MASTER PLAN

The Yolo County Airport Master Plan is a comprehensive assessment of the airport's current and projected aviation activity, requirements for aeronautical facilities, and recommended plans for future improvements. The Master Plan will guide Yolo County officials in making informed decisions essential to future development and operation of the airport. This Master Plan sets forth logical and supportable recommendations for facility improvements and expansion based on aviation demand projections and should only be implemented as justified by actual demand and needs as they occur over time.

1. Plan Timeframe

The Master Plan has a 20-year timeframe.[1] The emphasis, though, is on the first ten years of this period. Potential activity levels and facility needs during the later years are addressed primarily to give an indication of the long-term direction of airport development.

2. Future Revisions

Planned airport improvements are depicted on three large-scale sheets (reduced copies are included in Section 6, Airport Plans). These airport plan drawings should be reviewed as necessary to assure that they continue to represent newly arising conditions and facility needs. It is recommended that the plan drawings be updated periodically to reflect new construction. A thorough review and updating, as necessary, of the Airport Master Plan should be done in seven to ten years.

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1 Although completed in 1996, Master Plan approval is contemplated in 1998. Hence, the Master Plan actually projects to 2015, or 18 years.

B. INVENTORY OF EXISTING FACILITIES (SECTION 2)

Yolo County Airport is a publicly-owned, public-use general aviation airport that was conditionally ceded to Yolo County by the United States Government following World War II. Although the County has made some improvements during the last 47 years, the military configuration of the airside facilities continues to influence the future development of the airport.

1. Airside Facilities

The principal airside elements consist of a single Runway 16-34, 100 feet wide by 6,000 feet long, a full length parallel taxiway 35 feet wide and several right-angle taxiways along the parallel taxiway that serve aircraft aprons and hangars. Also located along the parallel taxiway are several stub taxiways leading to hardstands that are holdovers from the U.S. Army Air Corps use of the airport during World War II. The runway is equipped with elevated edge lights, threshold and end lights, and basic pavement marking.

2. Other Facilities

In addition to aircraft tie-down aprons, the airport has several conventional and T-hangars for the storage of based aircraft. A private aircraft hangar is located beyond the south property line and has a "through the fence" access to the runway via a gravel taxiway. There is a security fence completely encompassing airport property. Principal access to the airport is by means of County Roads 29 and 95. Several fixed base operators (FBOs) provide servicing and fuel to the based and itinerant aircraft. The northeast corner of airport property is leased to the Yolo Sportsmen's Association for use as a recreation area for its members.

3. Adjacent Land Uses

Most of the land surrounding the airport is in agricultural production according to the Yolo County General Plan. However in the 1960's, the Rolling Acres Subdivision, to the south and southeast of the airport, was approved for five-acre residential plots. The Rolling Acres Subdivision, historically, has been a very sensitive area with respect to any increased use of the airport. In addition to the Rolling Acres development, new homes have been developed on 20-acre plots within a quarter mile of the airport. There has been denial of residential building permits within the airport planning vicinity on parcels impacted by aircraft noise.

C. AVIATION DEMAND FORECASTS (SECTION 3)

1. Purpose and Type of Forecasts

Aviation demand forecasts were prepared for the twenty year planning period. Projections include the number and type of based aircraft and hourly and annual operations that are expected to be performed by all aircraft using the airport. The purpose for estimating the character and magnitude of future traffic at the airport is to identify the types and sizes of future airport facilities needed to accommodate the increase in demand.

accommodate the increase in demand.

2. Forecast Methodology

Two independent projections of demand were made in order to explain the potential variation of economic factors that drive the demand for air transportation. The forecasts were identified as "Base Case" and "Enhanced Case." The Base Case assumes that aviation demand will be generated entirely by the economy of the Yolo County Airport air service area. Based on recent trends, modest growth is predicted from the present to the year 2000, after which a higher growth rate will be experienced for the next 10 years. The Enhanced Case assumes that the airport would attract a greater number of high performance corporate aircraft from a service area extending beyond Yolo County because of physical or environmental constraints on growth in adjacent regions.

3. Forecast Results

Under the Base Case scenario, aircraft operations are projected to increase from 60,000 in 1993, to about 78,464 operations in 2015. Based aircraft under the Base Case assumption are projected to increase from 70 aircraft in 1993, to 113 aircraft in 2015. Growth of aircraft operations and based aircraft under the Enhanced Case are projected to increase from 60,000 in 1993 to 101,039 operations in 2015, and from 70 based aircraft in 1993, to 145 aircraft in 2015.

D. DEMAND/CAPACITY ANALYSIS (SECTION 4)

1. Purpose of Demand/Capacity Analysis

Demand/Capacity Analysis is the process of determining the capacity of existing airport facilities and comparing the capacity with the forecast of future activity. This comparison identifies the capacity deficiencies of the various airport elements and indicates the need for facility expansion. The process also provides guidance on the phasing of facility needs throughout the forecast period. The capacity analysis addressed the airfield, aircraft service area, airspace, ground access, air traffic control and navigational aids.

2. Capacity Methodology

The aircraft operations capacity was calculated by applying the throughput capacity methodology that was developed by the Federal Aviation Administration (FAA) and currently used for U.S. airports. This approach provides for the calculation of annual (Annual Service Volume - ASV) and hourly (VFR and IFR) aircraft operations capacities. The capacity methodology requires that the hourly capacities be determined first, then converted into an annual value. Section 4 of this report explains the capacity methodology in detail.

3. Results of Capacity Analysis

The hourly VFR capacity of the existing airfield ranges between 95 and 105 operations per hour. Instrument capability does not presently exist at the airport. The annual capacity is calculated to be

230,000 operations. Capacities of the other airport elements are discussed in Section 5, Alternatives and Facility Requirements.

E. ALTERNATIVES AND FACILITY REQUIREMENTS (SECTION 5)

1. Introduction

Having identified the magnitude of future traffic to be accommodated at Yolo County Airport and the capacity of the airfield facilities, the next step in the planning process was to identify potential solutions for overcoming capacity deficiencies. There were found to be several alternative approaches to accommodate future demand. Section 5, documents the alternatives considered and the airport facility improvements for each.

2. Selection of Alternative Plans

Seven study alternatives were considered which provided a range in the size of aircraft that could be accommodated and the associated airport development costs. In each alternative, FAA design standards were applied for a specific category of aircraft (identified by Airport Reference Code - ARC - Category), according to airplane wingspan and approach speed. These alternatives are described below:

- Alternative A -- Development under FAA standards for accommodation of small, light aircraft (ARC Category B-I) with only visual approaches to landing runways.

- Alternative B -- Development under FAA standards for accommodation of larger, higher-performance aircraft (ARC Category B-II) with only visual approaches to landing runways.

- Alternative C -- Development under FAA standards for accommodation of larger, higher-performance aircraft (ARC Category B-II) with a non-precision instrument approach to Runway 16 with visibility minima greater than 3/4 mile.

- Alternative D -- Development under FAA standards for accommodation of larger, higher- performance aircraft (ARC Category B-II) with a non-precision instrument approach to Runway 16 with visibility minima as low as 3/4 mile.

- Alternative E -- Expansion of Alternative B to allow greater approach speeds likely to be seen in the future (ARC Category C-II).

- Alternative F -- Expansion of Alternative C to allow greater approach speeds likely to be seen in the future (ARC Category C-II).

- Alternative G -- Expansion of Alternative D to allow greater approach speeds (ARC Category C-II), which exceeds the airport boundary along County Road 95.

3. Recommended Alternative Plan

In view of the need to balance the various components of the airport and to provide all-weather capability to support the forecast growth in corporate/business aviation, the adoption of Alternative F is recommended. This alternative applies restrictive setback criteria for corporate/business aircraft that are already in common use at the airport. Dimensional criteria affected by these more restrictive aircraft include the parallel taxiway separation, aircraft parking limit line restrictions, runway safety areas, and instrument approach capabilities.

4. Facility Requirements

Land Availability. Most of the land required to support current and future facilities is already in fee ownership. An exception is the need for additional acreage to enlarge the runway protection zones (RPZs) for Runway 16-34 to meet FAA standards.

Existing Leaseholds. Existing airport leaseholds are consistent with the pattern of future development recommended for the airport.

County Operations. Most of the County owned structures are in serviceable condition and are expected to remain functional for some time. Certain structures may be candidates for demolition to make way for a proposed County Administrative Complex.

Design Standards. Acceptable design standards must be applied to the aircraft operating areas. The most critical are the FAA standards for runway and taxiway setback distances, runway protection zones and related dimensions.

Utilities and Infrastructure. The Yolo County Airport contains all of the basic utilities and infrastructure to accommodate needed expansion. However, most of the systems will need expansion and/or upgrading as new airport improvements are constructed. Natural gas service is not currently provided at the Airport, but is available in the area.

Aircraft Tie-Downs and Hangars. These functions are located in the aircraft basing/servicing area of the airport. Tie-downs are required for both based and transient aircraft. To meet the forecast values, it should be considered that there will be a greater demand for hangars than tie-down parking. Over the long term it is estimated that more than 50 percent of based aircraft will require hangars. Over the 20-year planning period, at least 30 additional hangars will be needed to satisfy this demand. The balance of based aircraft will still need apron tie-down parking.

5. Other Airport Facilities

Terminal Building. A new terminal building is proposed to replace the public facilities currently

provided in Hangar No. 1.

Fixed Base Operations. Although the full range of aircraft services are available, in the future, it is anticipated that an additional FBO might be needed to accommodate the forecast increase in jet, multi-engine propeller and turboprop aircraft activity at the airport. It should be the policy of the County to permit only FBOs intending to serve multi-engine aircraft to develop this third FBO site.

Fuel Facilities. It is recommended that itinerant aircraft be fueled from fuel tenders at the existing transient tie-downs to reduce potential conflicts with taxiing aircraft.

Aircraft Rescue and Firefighting (ARFF). Since the airport is non-Part 139, there are no standards with respect to ARFF facilities and equipment. Nevertheless, it would be prudent to meet at least the minimum standards of ARFF capability, as well as establish an emergency operations plan.

Air Traffic Control Tower (ATCT). The 20-year forecast of aircraft operations will not qualify the airport for a Federal Aviation Administration ATCT.

F. AIRPORT DRAWINGS

Three airport drawings accompany this master plan report. The drawings illustrate the recommendations contained in this report. The provided drawings and a brief description of their contents are as follows.

1. Airport Layout Plan

This drawing is a layout of the entire airport showing both existing and recommended facilities. In addition, the drawing contains tables of significant existing and proposed airport and runway data. The plan also includes a wind rose and vicinity and location maps.

2. Airport Airspace Plan

This drawing contains the FAR Part 77 imaginary surfaces surrounding the airport. The purpose of this drawing is to provide guidance to County officials in preventing violations of height restrictions by future development projects around the airport.

3. Terminal Area Plan

The purpose of this drawing is to provide greater details of the building area of the airport. This is accomplished by highlighting the building areas shown on the Airport Layout Plan at a larger scale.

G. CAPITAL COSTS AND PHASING (SECTION 7)

Section 7 presents the cost implications of the recommended development program and the schedule for the improvements. The capital costs form the basis of the financial plan presented in Section 8.

1. Estimated Capital Costs of Recommended Development Program

Cost estimates based on 1995 dollars were prepared for the phased Master Plan improvement program. It should be noted that the capital cost estimate is not a commitment to expend the funds unless the actual demand for facilities is realized. Over the planning period, investment in expanded facilities could total $6,954,000. This sum is estimated to meet airport requirements through the short term (through 2002), intermediate term (2003-2007) and the long term (2008-2015). As described below, the capital costs would be apportioned between the FAA AIP, California's CAAP, airport tenants, and County Airport resources.

2. Development Program Phasing

The development program is phased over three development periods. The revised short term covers needed facilities through the year 2002. The estimated capital cost of the short-term program is $3,051,000. The intermediate term is a second five-year program expected to be needed 2003 to 2007. The estimated cost of the intermediate program is $2,336,000. The long term plan from 2008 to 2015. The long term program is estimated to cost $1,567,000. The above costs have been rounded to the nearest thousand dollars.

H. FINANCIAL PLAN (SECTION 8)

1. Capital Funding Sources

There are two grants-in-aid programs available for airport development: FAA's Airport Improvement Program (AIP); and the State of California Aid to Airports Program (CAAP). Other funding sources are private capital, airport operational revenues, and County funds (Airport Enterprise, primarily, and when warranted, the County General Fund.) in the form of loans.

2. Capital Improvement Program

Section 7 presents the estimated capital cost for each of the three development programs. These costs form the basis of this financial plan.

3. Revenues From Airport Activities

Operating revenues are derived from the various activities carried on at the airport. These are: Rents and Concessions; Fuel Flowage Fees; Aircraft Storage Fees; Business Licensees and Permits; Landing Fees; and, State Aviation Grant. Operating revenues are classified as Predictable, Variable or Non-Predictable according to whether the revenue is reliable and fairly constant or is subject to

variation depending on external factors, or could end abruptly. Historically, the Predictable source of revenue has amounted to 80% of total revenue.

Airport operating revenue from all sources during the past five years has shown a steady increase as follows :

FY 1990/91	$93,768
FY 1991/92	$82,417
FY 1992/93	$99,808
FY 1993/94	$100,548
FY 1994/95	$103,484

4. Airport Operating Expenses

Expenses in recent years have exceeded revenues by 35% to 39%, pointing out the need to increase the Predictable revenue base. Airport operating expenses involve the costs of staff salaries and benefits, services and supplies, and long term debt and interest.

Over the last five years operating expenses also have been increasing steadily as seen from the following tabulation, mostly the result of added debt service (FY 92/93) and salaries and benefits starting in FY 92/93.

FY 1990/91	$57,411
FY 1991/92	$67,687
FY 1992/93	$120,435
FY 1993/94	$139,809
FY 1994/95	$140,107

5. Airport Lease Evaluation

An evaluation of existing airport lease agreements was done to determine if sound business principals were followed to the benefit of the County. The evaluation uncovered some lease provisions that need rectification to adhere to FAA leasing polices and to improve benefits to the County. A survey of lease rates and charges at selected general aviation airports was undertaken to determine if the existing lease rates were competitive and comparable with other airports. The survey showed that the rates and charges at Yolo County Airport were at or below the average rates and charges at the airports surveyed. It was found that rates and charges for FBO ground leases, fuel flowage fees, and percent of gross sales are significantly below the average. However, terms of existing leases limit the amount of rates and charges increases that can be implemented.

6. Pro-Forma Cash Flow and Funding Requirements

A pro-forma cash flow analyses was prepared to identify the potential funding needed to implement the recommended development program. This was done for three alternative programs: Base Case; Enhanced Revenues; and, Enhanced Revenues and Hangar Financing. The pro-forma cash flow analysis was prepared for the first ten years of the planning period based upon the Enhanced Case

aviation forecast. Under this forecast, annual aircraft operations are projected to increase from 60,000 in 1994, to almost 79,000 by 2005. Based aircraft are projected to increase from 70 in 1994, to 106 in 2005.

Capital improvements were assumed to occur per the schedule contained in Section 7 of this report. The local share of the improvement program was assumed to be funded through current revenues and/or County contributions. Under the Base Case Analysis, local funding requirements to complete the capital improvement program total $1.78 million over the 10-year period.

Under the Enhanced Revenue Analysis, it was assumed that operating revenues were enhanced so that the local share of capital improvements was reduced to $1.33 million over the 10-year period.

In the Enhanced Revenues and Hangar Financing analysis, the capital cost for providing T-hangars is assumed to be completely financed through the State Revenue Generating Loan Program. The local share of the capital improvement program under this financial concept is reduced to $0.70 million over the 10-year period.

7. Minimum Development Program

Pro-forma cash flow analyses were prepared for two additional alternative programs to determine the potential funding needs generated by a minimum airport development program. The two alternative minimum development programs are identified as Base Case Minimum Development Program and Enhanced Revenue Minimum Development Program.

Local funding requirements under the Base Case Minimum Development Program total $228,500 over the 10-year period. Under the other minimum development program, and accounting for local funding requirements, the airport generates cumulative net revenues of almost $161,800 over the 10 year period.

8. Summary of Funding Requirements Under Alternative Revenue and Development Programs

The cumulative 10 year surplus or deficit generated by airport operations and the capital improvement program under each of the five alternatives evaluated results in a range of a $1.78 million deficit under Base Case to a $238,000 surplus under the Minimum Development Program/Enhanced Revenue scenario.

SECTION 2
INVENTORY OF FACILITIES

SECTION 2.
INVENTORY OF FACILITIES

The Yolo County Airport is a publicly owned, public use general aviation airport, which was conditionally given to the County of Yolo in 1948 and 1958, by the United States Government. The government initially constructed the flightstrip to provide alternative basing for aircraft during World War II. Since then, there have been many attempts to make those facilities a functional airport, but until recently is has remained essentially undeveloped. The paved runway has been used casually by crop dusters, flying schools, skydiving or for training activity initiated at other airports.

The physical layout of the Airport has certain development constraints associated with the facilities original use. When the Army constructed `the flightstrip during World War II, certain parameters were established as to present use and location of various areas. For the future use and expansion of the facility certain development constraints will have to be overcome. The most prominent are the 6,000-foot long by 100 foot wide runway and its adjacent taxiway with fueling bays and parking areas for aircraft. These facilities significantly influence future development of the Airport.

A. PURPOSE OF MASTER PLAN

The County of Yolo (the County) initiated this study to develop a Master Plan to guide future growth and development of the Yolo County Airport and to identify needed improvements to the aircraft operating areas and aircraft basing facilities as a response to forecast aviation demand.

The County envisions considerable growth in the corporate and general aviation aircraft operations, keeping pace with forecast growth in population and income within not only Yolo County, but also along the highway I-80 corridor extending from Solano County eastward into Sacramento County. To meet the changing needs of an expanding market, a systematic analysis of airport development needs was necessary. The Airport Master Plan provides this systematic approach to assist the County with initiating and carrying out a technically sound program for the short (0 to 5 year), intermediate (5 to 10 year) and long term (10 to 20 year) development of Yolo County Airport.

B. SCOPE OF MASTER PLAN

The Master Plan identifies existing conditions and development issues, provides forecasts of aviation activity, clarifies the demand for services and facility requirements (for airside and landside operations), and recommends specific improvements to the airport. Conceptual plans are provided as elements of a phased implementation plan to respond to projected demand and to manage growth. To augment the planning of expanded services and facilities, financial feasibility and analysis focuses on the commitments necessary to carry out the proposed development

projects. Accordingly, estimated costs and possible financing arrangements are shown for initial, intermediate and ultimate development projects.

The following summarizes the scope of work:

- Collect and organize data (including a review of a background summary of current policy and regulations affecting the Yolo County Airport);
- Coordinate with as well as inventory and collect information from airport tenants and businesses regarding facility needs; solicit input from local community interests concerning environmental and other special needs, as well as regarding economic impact, market potential and future expectations for the airport;
- Develop a project base map in digital format;
- Prepare short, intermediate and long range forecasts of aviation demand, coordinated with SACOG, Caltrans and the FAA with the aim of identifying the market potential as well as indigenous demand of the Airport's air service area;
- Determine runway/taxiway/apron facilities required to serve forecast aviation demand, and compare with existing and planned capacity;
- Develop an Airport Layout Plan which can be approved by the County Board of Supervisors and FAA;
- Prepare a plan identifying further development of aircraft storage facilities as well as considerations of potential new operational and administrative facilities;[1]
- Prepare a building area plan to complement and update, as required, the airport land use plan;
- Prepare an Airport Airspace Plan showing FAR Part 77 imaginary surfaces to control the height of man-made and natural objects near the airport.
- Address requirements for utilities and service infrastructure including water and power;
- Prepare an economic and financial analysis of the proposed Capital Improvement Program for 5- and 10-year annualized accounting of income,

1. Related uses include airport administration, pilot lounge, flight planning and filing, snack bar and meeting room.

expense and development cost as a basis for evaluating future rates and charges and project budgeting. Long-term (20-year) forecasts would also be considered;

- Provide the opportunity for review, input and evaluation of the plan by Airport businesses (FBOs), local agencies, the general public and responsible community interests through a program of public participation workshops;

C. HISTORICAL REVIEW

The U.S. Government initiated the construction of the Davis-Winters airstrip in 1942, to provide alternative basing for B25's normally located at McClellan Air Force Base. The construction was initiated on July 20, 1942, and completed on October 29, 1942. Financing was entirely from Federal funds established for the construction of flight strips. The initial construction consisted of grading a flight strip 800 feet wide by 8,000 feet long and surfacing the 150 foot central portion for a length of 4,000 feet.

Subsequent construction in 1943 by the U.S. Army Corps of Engineers added 1,000 feet of pavement at each end of the runway, increasing the length to its present 6,000 feet. and the building of 10 revetments. During the end of winter in 1942-43, the runway settled because the subgrade soil was of poor quality and had to be replaced with a more suitable base material.

In 1948, the United States Government conditionally gave the runway and taxiway area to the County of Yolo. In 1958, the eastern half of the airport was given to the County. At this time the Davis-Winters Airstrip, under the administrative control of the County, was named the Yolo County International Airport.

Under the jurisdiction of the County, in 1958 public restrooms were constructed. In 1971, with approximately $30,000 of State Aviation gas tax and County money, a 86 foot wide and 6,000 foot long portion of the runway was resurfaced. The original runway did not drain properly so the runway had to be mounded slightly and repaved. On February 25, 1974, the name of the Airport was changed from Yolo County International Airport to the Yolo County Airport.

There were many attempts to make the facilities of the Airport more functional yet, no real improvement occurred other than occasional maintenance until August of 1974, when Yolo Aviation Inc. entered into a lease agreement with the County. Yolo Aviation, known as the Fixed Base Operator, leased 14.9 acres of the Airport and constructed an office and pilot lounge, 20 "T" hangars, a large maintenance hangar, and fueling facilities.

In January 1976, Yolo County Aviation Advisory Committee was established, and has been meeting on a monthly basis since that time, to determine the future development of the Yolo County Airport. In 1993, a second airport oversight committee was created as the West Plainfield

Airport Development Advisory Committee, to give greater voice and input to on-airport development.

In 1978, the County secured a grant and loan to purchase and install a limited medium intensity runway lighting system. This system is radio activated by certain radio frequencies from aircraft in the vicinity that wish to land at night.

Also in 1978, the County Public Works Department secured a grant from the State and Federal Highway Administration for the construction of a paved access road of County Road 29 into the central portion of the Airport. This road consists of a Class C standard road which requires two 12 foot paved lanes with a minimal shoulder and no sidewalk, curb, or gutter.

D. INVENTORY OF EXISTING FACILITIES

1. General Description

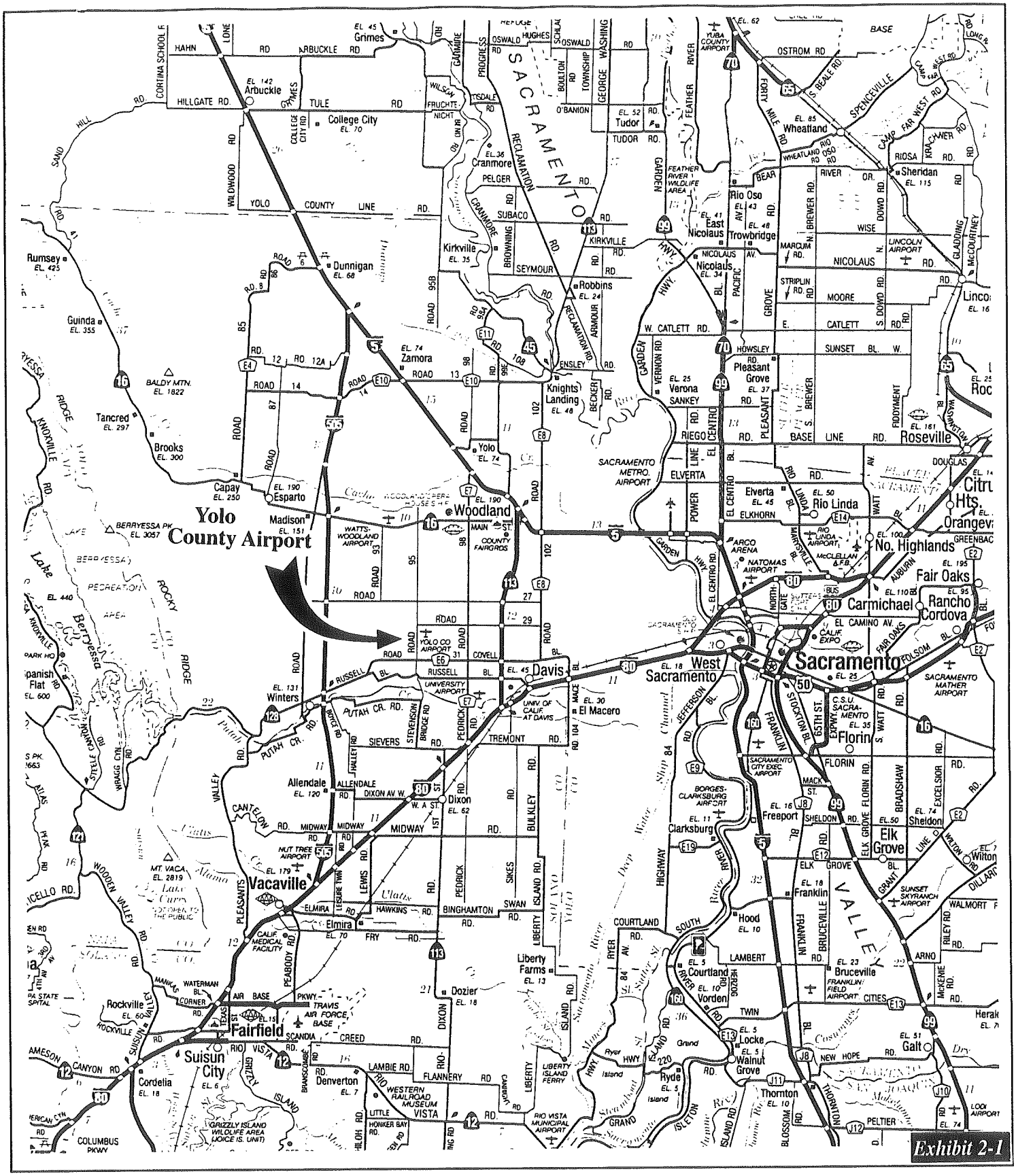
The physical layout of the Airport has certain development constraints associated with the facilities original use. When the Army constructed `the flightstrip during World War II, certain configurations of the airside and landside facilities were established so that present use and location of various functions do not utilize available land area in an efficient manner. For the future use and expansion of airport facilities, certain development constraints will have to be overcome, the most prominent are: the 6,000 foot long by 100 foot wide runway and its adjacent taxiway with fueling bays and parking areas for aircraft. These facilities predetermined the formation of the future development

2. Airport Location

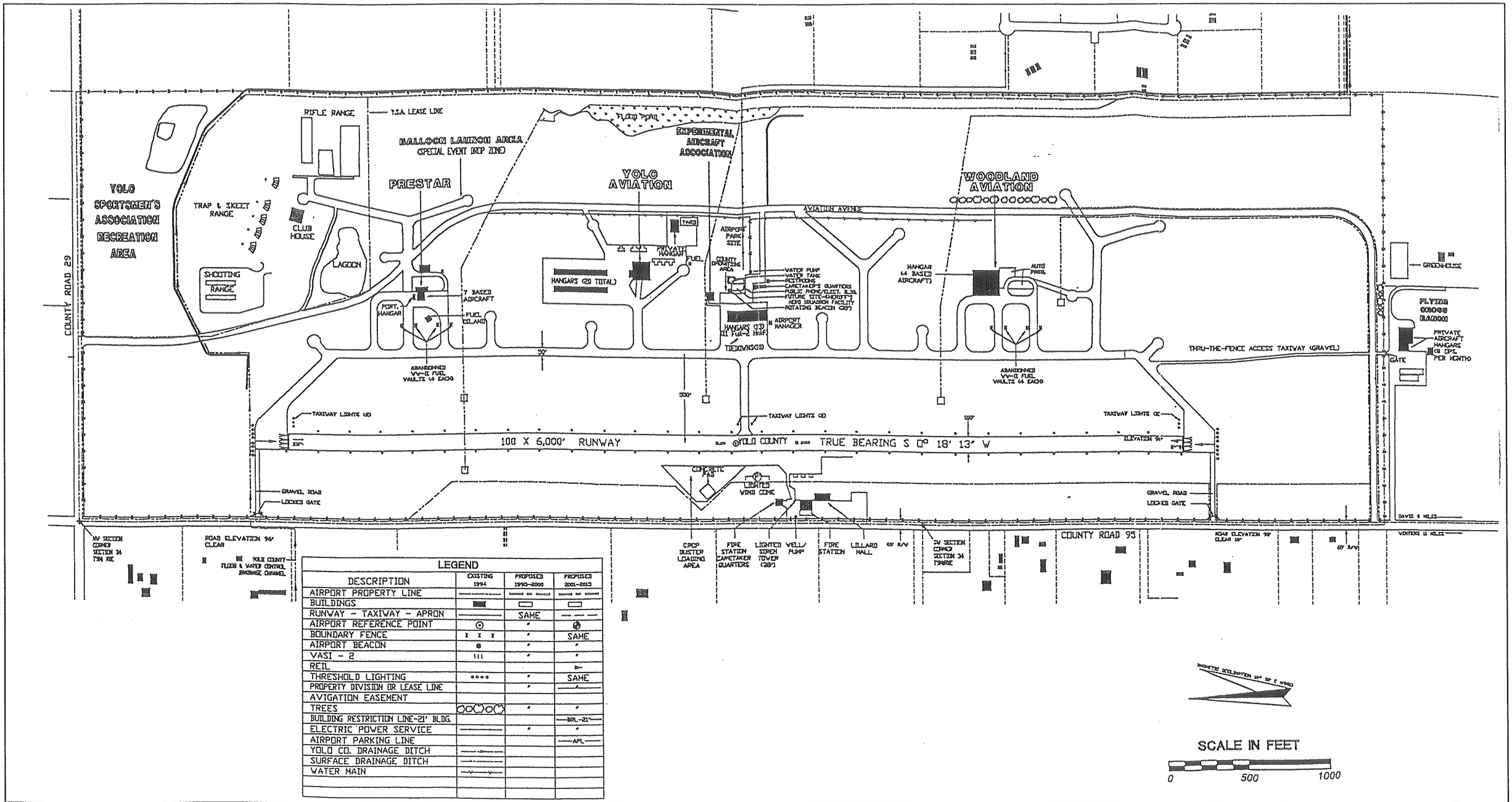
The Yolo County Airport is located within the environs of Woodland (seat of Yolo County government) and Davis (home of a major campus of the University of California). The Airport lies at the western fringe of the Davis environs on unincorporated lands and is readily accessible from Interstate Highway 80 via County Roads 98, 31 and 95. The County is located is located in California's Lower Sacramento Valley, and the Airport lies roughly 20 miles west of Sacramento. See Exhibit 2-1.

3. Runways

The Airport is equipped with a single Runway 16-34 that is 100' wide by 6,000' long. The runway edges are asphalt, while the center portion (takeoff and landing strip) is concrete. Aircraft parking, fueling and services are located on the runway's east side. The west side of the Airport is devoted primarily to agriculture and other non-aviation uses. Also located on the west side is a transient staging area for aerial applicators. Most of the west side of the airfield is undeveloped. The current airfield configuration is illustrated on Exhibit 2-2, *"Existing Airport Facilities."*



Regional Map



LEGEND			
DESCRIPTION	EXISTING 1994	PROPOSED 1995-2000	PROPOSED 2001-2015
AIRPORT PROPERTY LINE			
BUILDINGS			
RUNWAY - TAXIWAY - APRON		SAME	
AIRPORT REFERENCE POINT		"	
BOUNDARY FENCE	X X X	"	SAME
AIRPORT BEACON		"	"
VASI - 2		"	"
REIL			
THRESHOLD LIGHTING		"	SAME
PROPERTY DIVISION OR LEASE LINE		"	"
AVIGATION EASEMENT			
TREES		"	"
BUILDING RESTRICTION LINE-21' BLDG.			BRL-21
ELECTRIC POWER SERVICE		"	"
AIRPORT PARKING LINE			APL
YOLO CO. DRAINAGE DITCH			
SURFACE DRAINAGE DITCH			
WATER MAIN			

Exhibit 2-2

Existing Airport Facilities

4. Taxiways and Aprons

Aircraft may access the basing and services area by a parallel taxiway running the full length of Runway 16-34 and a single connecting taxiway near midfield. The parallel taxiway is separated from the runway by 550 feet, exceeding FAA design standards for an airport with visual or non-precision approaches. The portion of the parallel taxiway in the vicinity of the County apron serves as an apron edge taxiway.

The aircraft basing/service area includes two principal apron areas, the aforementioned County apron at midfield and an apron under lease to Yolo Aviation, north of the County apron. The County apron measures roughly 250 feet by 300 feet, and the Yolo apron measures about 270 feet by 500 feet. Hangars are situated on both aprons, covering an area of about 4.8 acres. FOBs Prestar Aviation (aka Skydance) and Woodland Aviation occupy leaseholds with no well-defined aprons. In both instances, aircraft are parked on internal taxiways.

Facilities for based aircraft include the following:

LOCATION	HANGAR SPACES	TIEDOWN SPACES	TOTAL SPACES
County [1]	13	9	22
Prestar	2	2	4
Woodland	4		4
Yolo [1]	26	3	29
Other[2]	5	2	7
Totals	**50**	**16**	**66**

1. Some hangars can accommodate up to three aircraft
2. EAA and Ingraham Hangars

Although the existing taxiway system provides adequate aircraft circulation for the current uses and level of activity, two notable deficiencies are apparent :

- The parallel taxiway separation exceeds FAA minimum standards; therefore a significant portion of the infield is unproductively utilized.

- The provision of only a single midfield connecting taxiway may limit the capacity of the airfield to serve future aviation needs.

The majority of the taxiway and apron pavement was created when the runway and taxiways were originally constructed. However, the recently reconstructed taxiway system is rated to accommodate, on a regular and routine basis, maximum aircraft weights of 30,000 pounds single wheel load, and 45,000 pounds for dual wheel loads. The taxiway system is 35 feet wide,

consistent with the planning standard for Airport Category, Design Group II (aircraft wing spans up to 79 feet and approach speeds of up to 141 knots).

5. Navigational Aids and Facilities

In place navigational aids and facilities include the following:

- Medium intensity runway edge and threshold lights
- Segmented circle and illuminated wind cone
- Rotating beacon

The locations of these navigational aids are shown on Exhibit 2-2.

6. Existing Buildings and Structures

Within the physical development of the airport area, the existing buildings and structures have been constructed during lease activity of the airport property. The Yolo Sportsmen's Association has constructed several physical features such as: a trap shooting area, pistol and rifle range, an archery range, a clubhouse, a caretaker's trailer, restroom facilities, a parking area, and many landscaping and irrigation improvements have been developed on the site.

Firefighting services for the airport are provided by the West Plainfield Fire Protection District. Its fire station, located on the west side of the airport adjacent to County Road 95, is managed and serviced on a mostly volunteer basis. The physical features, in addition to the fire station are: a 500-600 gpm well and water tank, a 38-foot siren tower, 37' antenna, and Lillard Hall, which serves as a meeting place for the West Plainfield community.

Within the physical layout of the Airport, the fixed base operator has constructed two sets of T-hangars that provide 20 spaces. A large hangar, 100 feet by 100 feet, was constructed at the facility with an office and lounge, which is jointly used by a sublessee, Whirlybirds, Inc.

Other facilities are a mobile home for the caretaker and a concrete load pad used by cropdusters. A concrete public restroom facility constructed by the County is located at the airport. A small concrete block building houses the water well and a second small concrete block building contains equipment for operating the runway lights.

7. Existing Utilities

The primary provider of utilities is Pacific Gas and Electric Company. Natural gas does not exist on the site, but is available from County Road 29. Overhead electrical lines that provide service to the Yolo Sportsmen's Association terminate at the Sportsmen's Club's eastern boundary. Electrical lines servicing the several tenants and structures come in above ground at the midpoint of the development, from the rear of the Rolling Acres subdivision. It is proposed to have utility lines placed underground on the airport property. The major constraint is the potential for

navigational hazard by the establishment of above ground poles. The maximum height of any pole or structure on the airport property cannot exceed 30 feet without a use permit, so control exists for the height of any future utility lines on airport property.

A well provides water for the entire facility. The well was cleared and inspected in 1990. In 1991 a new 5 horsepower pump was placed on the original well so that there is more adequate power and water available. Storage is provided by two 1,000-gallon hydropneumatic tanks and a 166,000 gallon storage tank with domestic and fire pump capacity of 2,000 gallons/minute. The well is currently in poor condition and requires replacement.

Public restrooms were constructed in 1958. The restrooms are accommodated by a septic tank and leach field. Pacific Bell provides telephone communication services, coming in at the midpoint of the development, similar to the electric facilities, from the rear of the Rolling Acres Subdivision, also above ground. The telephone lines serve the entire Airport. It is also proposed to have this service placed underground.

As described above, it is recommended to have all existing and future electrical and telephone lines on the airport placed underground. This would enhance the safety of aircraft operations and contribute to the aesthetic quality of the airport.

8. Vehicular Parking

In addition to parking for visitors located adjacent to the major FBOs, vehicular parking adjoining the County's apron/basing area is provided by a paved area east of and adjacent to the County's hangars. The area is unmarked but the periphery provides space for visitor's cars. Tenant vehicles are customarily parked within or adjacent to their respective leased hangars. The perimeter of the paved area is landscaped with lawns, trees and ornamental shrubs. A loop driveway from Hanford-Armona Road to the area encircles an unpaved landscaped area approximately 100 feet by 220 feet bordering the paved parking area on the south.

9. Access and Circulation

In 1978, the County Planning and Public Works Department secured a grant from the State and Federal Highway Administration for the construction of an access road off of County Road 29 into the central portion of the airport. The road consisted of a Class C standard requiring two 12-foot paved lanes with a minimal shoulder and no sidewalk, curb, or gutter. As part of the construction plans, numerous culverts were placed under the road and the entire road was elevated to be above what was known to be the highest flood point along its course.

Construction of the internal street system of the airport is proposed in three phases. Phase 1 was completed in 1978. Phases 2 and 3 consisted of extending the present internal access road (Aviation Avenue) to the south end of the runway, and turning west to join County Road 95. This Class C standard road, of approximately 5,500 lineal feet, creates a loop configuration for secondary and emergency traffic flows. Phases 2 and 3 were completed in 1989 and 1990.

10. Other Airports in Yolo County and Surrounding Area

Several airports in Yolo County and the surrounding area are important to the Yolo County Airport Master Plan because their service areas overlap with that of Yolo County Airport and to varying degrees they compete for general aviation demand. Other public use airports in Yolo County are:

- University Airport, Davis
- Watts0Woodland, Woodland
- Borges-Clarksburg, Freeport Bridge

Although it is outside Yolo County, Nut Tree Airport in Vacaville also competes somewhat with Yolo County Airport.

University Airport. University Airport, a publicly owned and operated facility (University of California at Davis) is located two miles west of Davis and approximately six miles southeast of the Yolo County Airport. There are two fixed base operators who provide the combined services of aircraft repair, flight instruction, charter service, and agricultural application.

Runway 16/34, 3,160 feet long, the apron area, and taxiways are all asphalt and in fair to good condition. Ten individual hangars, ten T-hangars, and ten open shades provide sheltered aircraft storage for 30 aircraft. Additionally, there is tie-down space for approximately 72 aircraft.

In May, 1996, there were 62 aircraft based at the airport. Airport operations were estimated to be 35,000 in 1995.

The University of California (airport owner) recently completed a study to determine the future role of this airport. This study considered the proximity and planned operational capability of the Yolo County Airport, and the ability of this airport to serve the same public demand as the University Airport. As a result of this study, the University has decided to neither expand nor close its facility, but rather maintain the airport as it now exists to serve its function to the University and limited public demand. Public demand in excess of the airport's capacity can be served by the Yolo County Airport and Woodland Watts Airport

The only foreseeable plan for expansion is minimal and would not result in an increased number of based aircraft. Future plans may include the construction of 10 sheltered storage areas which would merely shift the existing aircraft from the out-door storage area.

Woodland-Watts Airport. Woodland-Watts Airport is a privately owned facility. It is located 5 miles west of Woodland, approximately 6 miles north of Yolo County Airport. Services provided by two fixed base operators include flight instruction, charter flights and major aircraft repair.

The taxiways, apron, and Runway 18/36 (3,700 feet) are all asphalt and in good condition. Aircraft storage facilities include four conventional hangers, 44 T-hangers, and tie-down space for 25 aircraft.

There are currently (May 1996) 55 based aircraft located at the airport. There were estimated to be 4,000 annual operations in 1995.

Borges-Clarksburg Airport. Borges-Clarksburg Airport is located north of Clarksburg along the Sacramento River in southeast Yolo County. The airport has a single turf runway, Runway 9-27, which is 2,335 feet long and 75 feet wide. As of May 1996, there were 13 single-engine piston aircraft based at the airport. Estimated operations in 1995 were approximately 1,000.

Nut Tree Airport. The Nut Tree Airport is a Solano County facility located two miles east of Vacaville and about 10 miles southwest of the Yolo County Airport. It serves primarily the general aviation needs of Solano County. There is one fixed base operator offering services including aircraft repair, flight instructions, charter flights and fueling.

Runway 02/20, 3,800 feet and apron are asphalt and in good condition. There is one large maintenance hangar, 67 County-owned T-hangars and 35 privately-owned hangars are being constructed.

In May 1996, there were approximately 210 aircraft based at the airport. In 1995, there were estimated to be 90,000 aircraft operations.

E. NATURAL ELEMENTS

1. Meteorological Conditions

Atmospheric Conditions. The Yolo County Airport is located in the Central Valley in the State of California. The Airport is situated in the Mediterranean climate type of the dry interior of the Central Valley. Yet, the airfield is strongly influenced by the Maritime and Marine climate associated with the San Francisco Bay Area. Rainfall average is about 17 inches per year, which generally falls in a period between November and March. Snow seldom occurs. During the winters months there are occasional periods when a layer of fog will form and establish itself for a span of two to three days and, at times up to two or three weeks in duration. The growing season is 262 days out of the year during which time the temperatures are above 32 degrees Fahrenheit. Maximum temperatures reach 114 degrees Fahrenheit and lows have been to 15 degrees Fahrenheit.

Climate Features. Prevailing winds are southwesterly with a average speed of 10 miles per hour. Speeds of 50 miles per hour occur, very infrequently, about once every 10 years. Cloud cover is estimated to be approximately 196 clear days per year with 65 partially cloudy days per year and 104 cloudy days per year. Heavy fog has been recorded 36 days per year.

Wind Conditions.[2] The winds in Yolo County are greatly influenced by the north coastal mountain range on the west and the proximity to the Pacific Ocean. Westerly winds that prevail most of the year are modified into southerly directions by the physical barrier of these coastal mountain ranges. Even northwesterly winds off the coast are often turned into southerly winds in Yolo County. This phenomenon of prevailing southerly winds, often called sea breezes, exists in many parts of the Sacramento Valley.

For example, the 5-year average of wind direction for Davis, shows a majority of southerly winds for most of the year. The only other winds occurring to a great extent are northerly which are even more frequent in October, November, and December. On the other hand, in midsummer, the north directions dominate by far. This is especially striking during the night, when the northerly directions practically disappear. In the daytime there are still a considerable number of northerly winds. The build-up of these winds during the day can also be noticed in all other months. This suggested the existence of a diverse wind pattern that was investigated for various locations in the Valley through the support of the U.S. Public Health Service. Data was gathered from the locations of Winters, Dunnigan, Davis, Sacramento, Executive Airport, and Grimes. The study shows that in Sacramento Valley the southerly winds strongly dominate during the summer months, and usually continue from dusk through the evening. In Yolo County, a large portion of them cease during the morning hours when a considerable number of northerly winds occur.

The percentage of the northerly winds is not high at the Sacramento Executive Airport near the eastern border of Yolo County, but it increases rapidly between this point and the western part of Yolo County. At Davis, the temporary change to northerly directions occurs on more that half of the days at about 9:00 a.m. PST. It is still more pronounced at the stations west of Davis, in the vicinity of the Yolo County Airport, so that the switch to southerly winds in the afternoon becomes more striking. Similar developments also are observed in spring and fall, unless suppressed by major storm activity or different barometric patterns from those prevailing .

2. Geography

The airport property is in the center of the Sacramento Valley, which constitutes a gently sloping plain with drainage to the southwest, within the Central Valley of California. The average elevation of the area is 95 feet above mean sea level. Forty miles to the northwest, the elevation is approximately 1,300 feet while continuing 30 miles further, it is approximately 3,400 feet. At a distance of 55 miles to the west, Mount St. Helena rises to an elevation of 4,340 feet, while 85 miles to the east, peaks of the Sierra Nevada rise to an elevation of 10,400 feet.

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2 Wind Conditions: (Source - The Climate of Yolo County, *"Wind Patterns of Sacramento Valley"* prepared by H.B. Schultz, W.E. Yates, G.E. Miller, and M.D. Fitzwater in 1971).

3. Geology

The Plainfield Ridge is the predominant geographic and geological feature in the area. The rolling topography of this region is formed by the surface displacement of the eroded remnant of the Plainfield Ridge. The Ridge is an elongated anticline which flows in a northwest to the southwest direction along the foothills to the Coast Ranges and is approximately 30 miles long commencing in Colusa County and terminating near Davis. The area contains hard silt and clay, sandstone and cemented gravel of the Tehama formation which tends to impede the movement of ground water between the Upper and Lower Cache-Putah Basin. The Yolo County Airport is on the southern edge of this anticline. The geology affects both the makeup of the soils and drainage patterns which have occurred on the site

The underlying geology may pose a constraint, to certain areas of the property, when drilling for surface water for future needs. The fractures and faults in the bedrock material may prevent precise drilling and adequate water supplies. To date, the wells that have been drilled on the Airport property have yielded sufficient quantities of water.

4. Soils

The soils at the Yolo County Airport are Class II and Class III soils consisting primarily of the Myers Clay and Hillgate Loam series. Regarding the Myers Clay, its make-up is slowly permeable, with a very slow surface runoff. Yet, the Clay has little or no hazard of erosion. The available water holding capacity is 8.0 to 10.0 inches, but shows a very tight lense below 48 inches that restricts water percolation. The effective rooting depth is more than 60 inches. Its natural fertility is high, capability unit IIs-5(17). The characteristic of Myers Clay as a topsoil is poor and makes a poor quality road fill with a rating of A-7. It also has a very high shrink-swell potential that means buildings and structures that are constructed on it must have adequate foundation base amendments to the soils prior to construction. Also, the Myers Clay has a severe soil limitation for septic tank filter fields. As illustrated in the construction plans of the septic tank leach lines for the public restroom facilities, which are located across from the electrical room, a large amount of gravel and pervious materials must be amended to the soils for adequate septic tank leach lines.

The second soil is the Hillgate Loam series its surface runoff is very slow and the erosion hazard is none to slight. The effective root depth is 20 to 30 inches. Its natural fertility, capability unit IIIs-3(17), which is a fair to poor topsoil for agriculture purposes. For road fill it rates a poor A-6 to A-7 and, it too, has a high shrink swell potential for foundations. Its rating with regard to septic tank filler field permeability is poor. The Hillgate Loam is more of a limitation for surface disposal of sewage than the Myers Clay, however, both require amendments to the soils and design standards to create a more pervious surface for effluent land uses.

The soil characteristics form development constraints, subsequently design and engineering standards must be adequate to address the soil limitations. Along with the constraints identified with the soils for future development, an increase in cost for mitigating those constraints can be expected. One of the benefits of these clay soils is the construction of ponds or retention basins

can be facilitated due to the slow permeability of water through their surface. As mentioned, Myer Clay is very impervious to water with a very slow percolation rate. The current retention basins that have been constructed at the Airport are almost impervious to groundwater infiltration based on the experience of the current users at the Airport.

5. Drainage

One of the major development constraints to be identified on the 498 acres under County ownership of the Yolo County Airport is drainage. The problems to date have been located away from areas subject to ponding or sheet flow during heavy periods of rainfall. When the runway and taxiway were constructed during World War II, soil was excavated and deposited in another location to build the runway surface so that there was no problems of ponding in the vicinity of the runway, taxiway or the airport parking areas.

However, the eastern third of the property, the area to be developed as part of the Airport Development Plan, is the area lowest in elevation within the project site and subject to frequent flooding. The basic cause of the flooding is the relatively flat, terrain. The present drainage from the Airport follows a very flat, man-made course which causes the water to back up onto the low lying areas of the Airport. The general drainage pattern in Yolo County is for the water to flow easterly to the Yolo Bypass. At the Airport, drainage has been diverted south thereby reducing the slope of this course since it now travels a greater distance for the same fall. Overall, the drainage flows primarily from the west to the east with constrictions from the existing road and the Yolo County Flood Control and Water Conservation District irrigation canal. Both of these facilities act as impoundment areas and hold water from flowing from the west to the east. The drainage ditches and culverts under the Airport Road, which convey drainage from the area west to Airport to the Airport's eastern boundary are too small to convey the 100-year storm event, and backup in these areas can occur.

The drainage channel closest to this facility is Airport Slough located south and due east of the airport property. The height of the water in Airport Slough affects flooding within the airport from the adjoining airport drainage ditch, since the area along the Airport's eastern boundary is essentially flat. The drainage from the Airport constitutes approximately one-half the flow in Airport Slough just prior to its entering the residential development for Rolling Acres. The existing channel storage within the Airport accounts for 20 percent of the channel storage in Airport Slough between the residential development and Road 95. The Airport drainage basin has an area of approximately one square mile, which produces 180 acre-feet of runoff and a peak flow of 170 cfs for a 100-year, 24 hour duration storm event (although not all of this runoff enters the Airport Slough floodplain from the airport).[3]

The Chickahominy project, sponsored by the Soil Conservation Service, identified the eastern 200 feet of the project area as being subject to flooding. This portion of the Airport property is poorly drained and is subject to frequent flooding. Floodwaters crest at the elevation of 86 feet

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3 *See Borcalli, Ensign & Buckley, "Yolo County Airport Drainage Plan," (October 4, 1984) and Cunningham Engineering Company, "Yolo County Airport Master Plan Drainage Evaluation," (April 27, 1998).*

and are maintained at the elevation of 84 feet for days at a time. This area is being proposed as a drainage and detention basin in future construction of lease areas that would be fronting on the existing access road into the airport. With the barren material extracted from this area, it could act as a drainage and detention basin, for eventual groundwater surface recharge in the area. The topsoil material would then be used for foundation and elevation of building pads for newly constructed buildings and facilities for aviation related areas.

6. Groundwater and Water Supply

The Airport property is located within the Plainfield Ridge ground water basin and in Airport Slough surface water hydrologic basin. The Plainfield Ridge is an isolated body of dissected alluvial deposits, which tends to impede the movement of ground water between the Upper and Lower Cache-Putah Basins. Airport Slough Basin is fed by several canals, irrigation ditches, and small streams whose flows are often sporadic. The principle drainage course is Airport Slough, receives winter runoffs and summer irrigation drainage from the entire central portion of the County and spills into the Yolo Bypass. The sources of water in this area are runoff from the foothills and south central portion of the County and diversions from Cache Creek at Capay. The groundwater table is affected by the underlying geology of the Plainfield Ridge. Due to the Plainfield Ridge there are many pockets of water located in the Airport vicinity, but a 500 foot deep well would not be an uncommon occurrence. Wells that are drilled through the Airport area are subject to the underlying complexities of the geology since the Plainfield Ridge is an anticline that is partially exposed in this vicinity. This is the southernmost reach of the Plainfield Ridge thereby affecting the groundwater availability in various locations.

Currently, there are three wells that serve the Airport area. The original well which was constructed by the United States Army at the time the Airport was established, was originally a 17 inch diameter casing which deteriorated and was replaced by a 12 inch casing which further was replaced by an 8 inch so that the well could continue operating. The groundwater level is approximately 18 feet and well depth is 265 feet, and the pump depth is 105 feet. It has a current production capacity of 46 gallons per minute (gpm) against a discharge pressure of 50 pounds per square inch (psi)

The Yolo County Sportsmen's Association has the second well which is operated from a five horsepower pump and is used for the purposes of irrigation, providing domestic water for the users of the Sportsmen's Association, and maintaining the water level in the Association's lake.

The third well is located on property leased by the West Plainfield Fire Department. This well has a 500-600 gallon per minute capacity and is the most recently placed of the wells on the Airport property. Currently the drop dusters utilize lines from this well for the mixing of their wet mix chemicals, to the east of the Plainfield Fire Station.

For the development associated with the Airport to occur, a system of water lines would be necessary. It is preferred that a loop system be established, for domestic and fire flow protection, so that if a break should occur on the line those users beyond the break would not be denied water service.

The proposed expansions will impact the hydrology of the area by creating additional impervious surfaces that will reduce penetration of surface water to the underground basin and will increase storm water runoff from the site. The increased storm water runoff would not seriously increase the flooding problem which already exists around the airport.

7. Vegetation

The natural vegetation at the Airport site has been replaced by oat hay farming activities. The only native vegetation that exists is located. in the drainage channels and in the area occupied by the Yolo Sportsmen's Association which has been allowed to revert back to its natural habitat.

The riparian vegetation associated with the drainage canal consists of tulles, various reeds, and other forms of native grasses associated with the channels. This channel is periodically cleaned and vegetation removed as the need arises.

The crops that are associated with the farming activity are dry grain crops where no irrigation is required. Amongst the dry grain crops that could be propagated on the site are wheat, oats, barley, and rye. Presently, oat hay is being grown, on an annual basis. From an aesthetic standpoint, the only feature of interest located in the vicinity, is a grove of Eucalyptus trees located near the southern boundary of the airport.

8. Cultural Resources

There are no archeological, architectural or engineering features of any significance located at the Yolo County Airport other that the Airport facility itself. The only historical significance the Airport may assume is its minor role during World War II as an auxiliary landing strip for McClellan Air Force Base. Lillard Hall has social significance to the West Plainfield community because the hall serves as a meeting place for the residents. The West Plainfield Fire Station is the focus for the mostly volunteer fire department.

9. Underground Utilities

All utilities on or near airport property should be placed underground. This not only adds to the safety of the airport but contributes to aesthetics. There are currently power poles located on the east side of the airport property serving the well and the leased areas.

10. Water Supply

Currently, one well supplies the water necessary for the airport tenants and for fire suppression. The standing water level is 18 feet, the draw-down depth is 106 feet, while the total depth is 235 feet. The pump produces 75 gallons per minute

11. Waste Water Treatment

The existing County septic tank and leach line system serves the present public restroom facilities. Each tenant has its own septic and leach line system. Full development of the facility will demand a treatment plant.

12. Storm Drainage

On and off-site conditions, Hillgate loam and Myers loam soils, have a very slow permeability which means surface runoff water percolates through the soil very slowly. The airport has a history of drainage problems. When future development occurs at the airport, upgraded drainage systems should be installed. The area drains into Airport Slough that has a historic flooding problem. Additional surface runoff occasioned by the development of the airport would be expected, and mitigation required. Temporary storage for floodwaters should be provided on the individual sites.

13. Chemical Storage

Toxic chemicals and pesticides should be stored in a fenced area to prevent unauthorized personnel from coming into contact with them. An area close to the taxiway and access road, yet away from the terminal, has been designated for the storage of chemicals used by the crop dusters. In the crop duster business water is also used, therefore, a separate waste liquid disposal system is employed to reduce the possibility of contamination.

F. ADJACENT LAND USES

Over 90% of Yolo County's 1,034 square miles of surface area is used for the production of food and fiber, in some form of agricultural use. Woodland and its "sphere of influence" occupy some 60 square miles in the central portion of Yolo County. The City ranks second in population among the three incorporated cities in the County. Approximately 3% of the total land area is developed and the remaining 97% is in agricultural or some other form of open space use. Of the developed land, most is used for housing, followed by commercial and public uses. Industrial land makes up a small but growing proportion of total land use.

1. Rolling Acres Subdivision

Most of land surrounding the Airport is designated in the Yolo County General Plan for agricultural use. Yet, in the 1960's, the Rolling Acres Subdivision was approved creating five-acre lots adjacent to the Airport property to the South and Southeast of the Airport. This subdivision is zoned Residential Suburban (R-S B180), and consists of five-acre lots fronting on the streets named Yosemite, Carlsbad and Yellowstone. This subdivision has been filling in with newer homes in the moderate to high price range for Yolo County. The Rolling Acres

Subdivision has historically been a very sensitive area with respect to any form of increased use at the Airport, particularly aircraft noise and overflight.

Mitigation measures will need to be developed to address the concerns of the area residents regarding the activities at the airport. Air quality, noise impact levels, safety considerations, and controls on the aviation activities can be monitored. Other tools may be implemented to lessen the impact of the increased use of the Airport on adjacent residences.

2. Large Lot Residential Development

In addition to the development of the Rolling Acres residential area near the Airport, new homes have been constructed on 20-acre parcels along County Road 95, County Roads 31 and County Road 29. The majority of the lots are less than 20 acres in area within a quarter mile of the Airport. Regarding those parcels which are greater that 20 acres in size, the Yolo County Board of Supervisors enacted a policy in 1977 which stated that no further lot division of the agricultural lands into parcels of less that 20 acres in size would be allowed within the airport planning vicinity. The effect of this policy has been to freeze the number of buildable dwellings within the Airport vicinity, and has tempered the creation of new parcels for additional homesites.

In 1980, based on a request from the Board of Supervisors, the Yolo County Community Development Agency established the 20-acre minimum parcel size policy for all sites abutting the Yolo County Airport. There is one exception to the 20-acre minimum parcel policy, for a 160 acre parcel on the northwest corner adjacent to the Yolo County Sportsmen's Association lease area. This parcel is currently zoned Agricultural Preserve (A-P) and is part of a large farming operation.

In addition, there have been denials of building and use permits based on the proximity of the applied use to the threshold area of the Airport and the proximity to noise associated with the aircraft operations.

3. Surface Transportation

The Yolo County Airport is located approximately 3 miles from the interchange connecting Interstate Highway 80 and 113. Interstate 80 running adjacent to Davis links the area to San Francisco and Sacramento metropolitan regions. The Yolo County Airport is located 5 miles from Davis and 7 miles from Woodland, which are the two major communities in Yolo County.

County Roads 29 and 31 must be improved in order to accommodate the Airport users coming from Woodland and Davis on County Road 98. County Road 29 is designated as a major transportation route. A serious problem exists at the intersections of County Roads 29 and 98. Problems such as straightening the road and the poor visibility would need to be addressed in order to improve accessibility to the Airport by this route. This Airport road was extended in 1990.

A minor limitation regarding the development of the Airport is the access off Roads 29, 31, and 95. These roads are presently suitable for the transportation of rural traffic, heavy agriculture machinery, products and freight. County Road 31 meets the highest standard for weight and construction profile for a Yolo County Road. County Road 95 is adequate from structural basis but also may need widening as additional traffic generated by the Airport development may require improvements in the distant future.

Due to winter storms, high amounts of runoff may occur causing several sections in the roads to become inundated with water and become impassable. Off-site drainage from the Airport is a concern since it is part of the Chickahominy Slough area that the United States Soil Conservation Service proposed a major project to divert and channel the water alleviating some of the drainage problems.

The Chickahominy and Airport Slough area has had a long history of ponding and flooding problems and will continue, until there is an overall drainage plan which would handle and increase drainage from the western Yolo County border to the Sacramento River.

4. Topography of Area

The field is in the center of the Sacramento Valley, a gently sloping plain with drainage to the southwest. The average elevation of the area is 95 feet above sea level. Forty files to the northeast, the elevation is about 1,300 feet while 30 miles further, it is about 3,400 feet. At a distance of 55 miles to the west, Mount St. Helena rises to an elevation of 4,340 feet, while 85 miles to the east, peaks of the Sierra Nevada rise to 10,400.

SECTION 3
AVIATION DEMAND FORECASTS

SECTION 3
AVIATION DEMAND FORECASTS

A. INTRODUCTION

A reasonable forecast of aviation activity is essential to determine future aviation facility requirements. Forecasts of based aircraft and operations form the basis for sizing and phasing important airport components, including facilities to serve based and transient aircraft, aircraft operating areas (including the runway, taxiways and ramp areas) and airport businesses (FBO's).

Moreover, the needs for navigational aids and ancillary services and facilities may be keyed to the anticipated level and types of aircraft activity. In addition, the adequacy of both air and landside facilities is influenced by the level of activity which can be anticipated during peak arrival and departure periods.

It is important to note that the general aviation forecasts presented in this report section are not necessarily representative of the total demand for all categories of aviation facilities and services which exists within the service area of Yolo County Airport. These forecasts recognize that other airports in the region, including U.C. Davis; Borges-Clarksburg; Nut Tree (Vacaville); Rio Linda; Natomas; Watts-Woodland; Sacramento Metro; Sacramento Executive; and, Mather Airports which will continue to serve a portion of total general aviation demand due to the fact that the geographic service areas of these nearby airports may overlap that of Yolo County Airport.

The forecasts further acknowledge that local demand for commercial air carrier and commuter services will continue to be accommodated at Sacramento Metro Airport.

B. AVIATION FORECAST SOURCES

The forecasts contained in this report section were derived from several sources including the Federal Aviation Administration, California Department of Transportation (CALTRANS), and Yolo County. Specific forecast references include the following:

1. FAA National Plan of Integrated Airport Systems (NPIAS) [1]
2. FAA Terminal Area Forecasts (TAF) FY 1989-2005 [2]
3. California Aviation System Plan (CASP) Forecasts
4. Yolo County Planning Department (1976/77 Master Plan)
5. Yolo County Community Development Agency (1983/87 Airport Development Plan)

These forecasts also draw upon forecasts prepared for other service areas including the San Francisco Bay Area whose general aviation use and growth patterns are similar to those of the Sacramento - Yolo metropolitan statistical area.

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[1] Federal Aviation Administration, "National Plan of Integrated Airport Systems" (NPIAS).

[2] Federal Aviation Administration, "Terminal Area Forecasts", FY 1989 - 2005 (TAF) FAA - APO - 89-5, 4/89.

C. HISTORICAL AVIATION ACTIVITY

Data concerning historical flight activity at Yolo County Airport was obtained primarily from estimates prepared by the Yolo County Planning Department (1976/77 MP) and the Yolo County Community Development Agency [1] (1983/87 Airport Development Plan). These data were supplemented by historical information set forth in the California Aviation System Plan and the FAA's National Plan of Integrated Airport Systems (NPIAS).

1. Aircraft Operations and Based Aircraft

Historical general aviation operations data for a six year period is shown in Table 3-1. Based on County and FAA estimates, the number of operations at the airport has remained at a constant estimated level of 60,000 annual operations. In the absence of more detailed records or estimates, this level of 60,000 operations is accepted as the best information available. The same sources estimated the number of based aircraft ranging from 29 in 1985 to about 65 in 1992. Although the estimates cannot be authenticated, they underscore the generally stable demographic and economic conditions and low rates of local population and income growth observed in recent years. [2]

The 1987 updated Airport Development Plan noted that some 29 aircraft were based at the airport in 1985. Despite the fact that the number of aircraft has risen to 70 in 1993, annual aircraft operations have presumably remained constant. Implicitly, this has occurred because of a reduction in aircraft utilizations in terms of operations per based aircraft. This reduction in the operations per based aircraft has been observed nationwide and is not a local phenomenon.

D. FORECAST METHODOLOGY

The validity of forecasts is completely dependent on the accuracy in predicting the variables that influence aviation demand. In the past, those variables of significance included population, employment and income of the community being served. Several other factors have become notable in recent years which have made it extremely difficult to predict future aircraft activity levels based on forecasts of demographic and socioeconomic conditions. These factors include:

- Sustained economic growth at the local, regional, state, and, national levels
- Rising fuel costs
- Increasing insurance premiums
- Local environmental restrictions.

Thus, it is no longer possible to accurately predict future activity solely on traditional forecasting variables. This fact has necessitated the application of judgmental factors to supplement socioeconomic trends in the forecasting effort.

Compounding this problem is an awareness that the achievement of any forecast may be affected by fluctuating conditions and is dependent upon the occurrence of other future events which cannot be assured. Thus, the potential accuracy of demand forecasts becomes more speculative

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[1] Now known as the General Service Agency.

[2] Population Growth over the period 1980-1993 is estimated at an average of 2.2% per annum.

Table 3-1

HISTORICAL GENERAL AVIATION ACTIVITY

Aircraft Operations [1]

Year	Local	Itinerant	Total
1985 [2]	40,000	20,000	60,000
1986 [2]	40,000	20,000	60,000
1987 [2]	40,000	20,000	60,000
1988 [3]	40,000	20,000	60,000
1989 [3]	35,000	25,000	60,000
1990 [3]	30,000	30,000	60,000
1991 [3]	30,000	30,000	60,000
1992 [3]	30,000	30,000	60,000
1993 [3]	30,000	30,000	60,000

Based Aircraft

Year	S.E.	M.E.	Total
1985 [4]	NA	NA	29
1986 [5]	NA	NA	30
1987 [6]	NA	NA	40
1988 [7]	NA	NA	40
1989 [7]	NA	NA	40
1990 [7]	NA	NA	50
1991 [7]	NA	NA	60
1992 [7]	NA	NA	65
1993 [8]	57	13	70

1. Including rotorcraft operations
2. Source: FAA Terminal Area Forecasts
3. Estimated
4. Source: 1987 Airport Development Plan
5. Source: FAA NPIAS
6. Source: FAA Terminal Area Forecasts
7. Estimated
8. Source: County Survey

N.A. : Not Available
S.E. : Single Engine
M.E. : Multi - Engine

as one looks further into the future. That is, it is possible to predict as much as three to five years into the future with reasonable confidence; it becomes more difficult to look further into the future, particularly in a period of economic uncertainty characterized by dynamic fluctuations and unpredictable behavior.

To contend with this problem, it was considered appropriate to create two separate sets of assumptions regarding the outcome of future events and circumstances which would influence demand. These two sets of assumptions define the forecast scenarios considered in this study: "Base Case" and "Enhanced Case".

1. Base Case

The Base Case assumes that demand will be generated entirely by the indigenous economy of Yolo County air service area. Based on recent trends, modest growth is forecast from the present to the year 2000, followed by a ten-year period of higher growth. The growth rate would then decline in response to natural behavior of a small market.

The assumption under which forecasting was undertaken for the Base Case include:

- Local (Yolo County) population will grow as forecast by California Department of Finance.
- The public service infrastructure and environmental carrying capacity of the airport environs will neither constrain growth nor limit the future service role of the airport.
- The airport service area will be limited to Yolo County, to the exclusion of adjoining areas of Sacramento and Solano Counties whose service areas may otherwise overlap Yolo County.
- The airport service role will remain primarily devoted to private aviation, flight training. and aerial application using light, general aviation aircraft. Limited use of large aircraft would be operated by corporate users and skydiving activities.

2. Enhanced Case

The Enhanced Case assumes that the airport would serve greater numbers of higher - performance "corporate" aircraft and would draw from a service area extending beyond the bounds of Yolo County because of physical or environmental restrictions on growth at other regional airports. The assumptions under which forecasting was undertaken for the Enhanced Case include the following:

- Indigenous aircraft activity growth will keep pace with California Department of Finance population growth projections.
- Local, federal and state government funding for airport improvements will remain available to permit major upgrading of airport facilities.
- Additional traffic would materialize at Yolo County Airport due to the uncertain future role of U.C. Davis Airport.

- Responding to a growing local need for corporate access to the national air transportation system, provisions will be made to accommodate greater numbers of permanently based, higher-performance turbo-prop and turbo-jet business aircraft including some currently using other competing airports.

- Physical and environmental limitations at other local airports (including Watts-Woodland and Natomas) may increase the likelihood of increased usage of Yolo County Airport.

- Restrictions on general aviation activity (particularly light aircraft) at Sacramento Metro Airport will make Yolo County Airport an attractive alternative for pilots from Sacramento County, as well as those conducting business in the Davis and Woodland area.

- The airport will succeed in attracting users of Sacramento Executive and Nut Tree Airports who might prefer Yolo County Airport if better facilities and services were offered.

3. Basis of the Forecasts

General aviation forecasts have been prepared based on the major state, federal, regional and local forecast resources noted earlier. The forecasts contained in each document, where relevant, were compared to identify useful trends. A comparison of the applicable CALTRANS, FAA, and County forecasts for each of the horizon years 2000, 2005, 2010 and 2015 illustrates the broad range of variables inherent in each of the forecast documents.

For purposes of establishing meaningful forecasts of general aviation annual operations, it was necessary to determine the relative validity of the range of the available forecasts. For Yolo County Airport, forecast data from the FAA TAF and NPIAS and the 1995 CASP were reviewed and compared with historical data (actual operations) and two previous County forecasts to establish trend lines.

Local Population Characteristics. Population data for existing and future conditions are based on the U.S. Census and forecasts derived from the California Department of Finance. [1] The official population of Yolo County in 1980 was 113,790. By 1990, the population had increased to 141,590 representing an average annual growth rate of 2.2 percent. From its current estimated population of about 155,000, projections prepared by the Department of Finance estimate that the County population will grow to 184,000 in the year 2000 and to 249,000 by the year 2015, representing growth rates of 2.5 percent and 2.0 percent for the two periods, respectively. Based on observations at other similar airports, local general aviation growth rates are expected to be lower than the population growth rates.

General Aviation Operations Forecast. As noted earlier, general aviation forecasts were prepared for aggregate demand from all classes of general aviation users of Yolo County Airport. The available state and federal forecast resources together with the previous 1976/77 Master Plan and 1987 Airport Development Plan were evaluated and compared to develop a preferred forecast.

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[1] Woods & Poole Economics, "1993 State Profile - California" December 1993.

A comparison of the local, state and federal aircraft operations forecasts is presented in Table 3-2. The trends displayed by the forecast comparison can be more readily visualized in Exhibit 3-1. Consideration of these sources yielded forecast trends which could be compared with historical performance and which should be considered in interpreting the forecasts. A brief discussion of each of the forecasts of aircraft operations is set out as follows:

- CASP. The state's CASP forecast uses a 1987 base year with an estimated 60,000 annual operations. This value coincides with the traffic estimate published in FAA's TAF. The CASP forecasts suggest very modest growth rates of 0.25 percent, 0.40 percent, and 0.50 percent over the three year, thirteen year, and eighteen year forecast periods. When normalized to a 1993 base year, these extremely modest growth estimates produce a projected 65,000 annual operations by 2010, representing an average annualized growth rate of 0.50 percent.

  This growth rate falls well below the state's own population forecast of 2.0 percent (or more) over the same forecast period. Thus, the CASP is considered highly conservative in that it does not appear to reflect the airport's potential (nor that of the Yolo County service area) to grow in response to latent demand.

- NPIAS. The FAA NPIAS forecast foresaw a moderate rate of growth beyond the 1986/87 date of preparation, amounting to some 2.2 percent per year over a seven year period and about 1.1 percent in the ensuing five years. The NPIAS forecast is believed to be more representative of the growth potential of Yolo County Airport and more consistent with state population projections.

- TAF. The Terminal Area Forecast is a "top-down" forecast wherein a gross, nationwide forecast is allocated to individual regions, hubs within regions, and to individual airports. The greatest significance of the TAF is that FAA's budgeting of prospective new navigational aids and staffing reflect needs identified in the TAF. Although prepared under different criteria and for different purposes, the TAF correlates well with the NPIAS forecast. The TAF suggests growth of about 1.8 percent over the seven year period through 2000 and about 1.0 percent through the year 2015. Though conservative, the TAF forecast allows for and validates the need for improved facilities to accommodate future aviation needs in Yolo County. [1]

- Master Plan. The 1976/77 Master Plan forecasts have proved to be highly optimistic reflecting the strong traffic growth in all components of general aviation that occurred in the late 1970's. If the Master Plan forecast is normalized to a 1993 base year, the annual growth rate approximates 4.7 percent through the year 2000, declining to an average 3.4 percent from 2000 through 2015. These growth rates are not considered realistic in view of present day activity trends.

- Airport Development Plan. The 1983/87 Airport Development Plan produced forecasts of based aircraft, but no operations forecast. However, the based aircraft forecast has proved to be reasonably accurate with a high Alternative 2 forecast of 71 based aircraft by the year 1995.

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[1] No forecast of based aircraft is included in the TAF.

Table 3-2

COMPARISON OF GENERAL AVIATION FORECASTS

Annual Aircraft Operations

	Actual	Forecast			
	1993	2000	2005	2010	2015
FAA NPIAS[1]	60,000	70,000	74,150	--	--
FAA TAF[2]	60,000	68,000	71,350	74,900	78,600
CASP[3]	60,000	62,750	64,000	65,500	--
1977 Master Pln[4]	60,000	82,750	102,140	119,000	135,950
1987 Dev. Plan[5]	--	--	--	--	--
1.0%[6]	60,000	64,328	67,610	71,058	74,683
2.0%[7]	60,000	68,921	76,095	84,014	92,759
3.0%[8]	60,000	73,792	85,546	99,171	114,966
5.0%[9]	60,000	84,426	107,751	137,521	175,516
1.0/1.5/1.0%[10]	60,000	64,328	69,300	74,655	78,464
1.0/2.0/1.0%[11]	60,000	64,328	71,023	78,416	82,416
1.25/2.0/1.25%[12]	60,000	65,451	72,263	79,784	85,950

Based Aircraft

FAA NPIAS	70	80	93	--	--
FAA TAF	--	--	--	--	--
CASP	70	71	71	72	--
1977 Master Plan	70	90	113	133	153
1987 Dev. Plan	70	82	94	107	--

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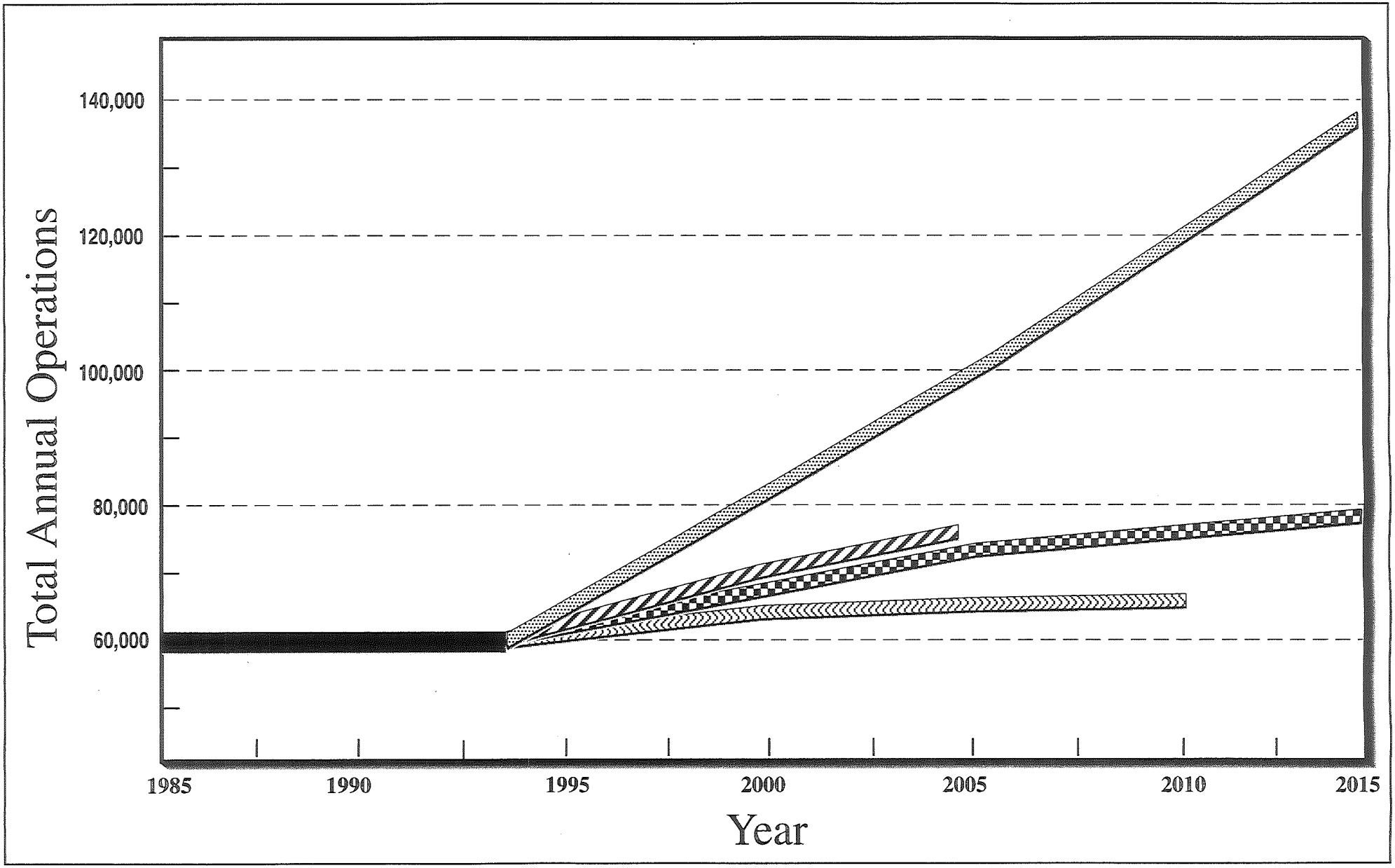
1. Federal Aviation Administration, "National Plan of Integrated Airport Systems"
2. Federal Aviation Administration, "Terminal Area Forecasts" [no based aircraft forecast available from source]
3. "California Aviation System Plan, Element II: Forecasts," August 1988
4. Yolo County 1976/77 Master Plan; forecast growth rate increments adjusted to 1993 base year
5. Yolo County 1983--87 "Airport Development Plan" [no aircraft activity forecast available from source]
6. 1.0 percent annual compounded growth.
7. 2.0 percent annual compounded growth.
8. 3.0 percent annual compounded growth.
9. 5.0 percent annual compounded growth.
10. 1.0% annual compounded growth through 2000; 1.5% 2001--2010; 1.0% 2011--2015
11. 1.0% annual compounded growth through 2000; 2.0% 2001--2010; 1.0% 2011--2015
12. 1.25% annual compounded growth through 2000; 2.0% 2001--2010; 1.25% 2011--2015



LEGEND

Historical | CASP | FAA NPIAS | FAA TAF | 1977 MP

Exhibit 3-1

Comparison of Previous Forecasts

General Aviation Based Aircraft Forecast. Table 3-2 also sets forth a comparison of based aircraft from the four forecast sources. [1] These forecasts are graphically compared in Exhibit 3-2. The CASP forecast suggests the addition of two more aircraft by the year 2010. This is not considered realistic in view of the fact based aircraft have increased at an average annual rate of 11.6 percent since 1985.

The NPIAS forecast suggests that 93 aircraft would be based at the airport by the year 2005, representing an average growth rate of 2.4 percent. As with the operations forecast previously discussed, the 1976/77 Master Plan presented an optimistic view of based aircraft potential due to the strong economic and general aviation growth which characterized the late 1970's. Although the normalized 1976/77 Master Plan forecasts suggests growth rates which do not appear to be realistic in view of present-day economic realities, the Airport Development forecasts present a credible view of based aircraft potential at the airport. The airport Development Plan anticipated 82 based aircraft by the year 2000 and as many as 107 by the year 2010, the outer horizon of the plan.

E. BASE CASE FORECAST

In addition to the presentation of the five local, state, and federal forecasts, Table 3-2 also includes several growth curves representing steady compounded rates of 1.0, 2.0, 3.0, and 5.0 percent together with variable growth functions combining 1.0 to 1.25 percent near-term (through the year 2000) with higher growth through the year 2010, declining thereafter. The seven growth curves are graphically illustrated on Exhibit 3-3. The seven curves are presented for comparative purposes and to assist in the interpretation of the local, state, and federal forecasts. Because of the wide range of forecasts available from the five forecast sources. It was felt that a more steady growth rate would better serve the requirements for assessing the need for future airport facilities and in presenting the requisite short, intermediate and long-term operations forecasts.

Because it mimics anticipated national trends as discussed earlier and because it represents a reasonable but conservative view of future socioeconomic conditions which cannot be easily or accurately predicted, the 1.0, 1.5, and 1.0 percent growth curves were selected as the forecast of operations under the Base Case assumptions as outlined earlier. This forecast is believed to be the most consistent with the "normalized" FAA forecasts and reasonably reflects indigenous growth potential.

Though characterized by modest growth rates, the chosen Base Case forecast is more realistic than the most recent CALTRANS forecast which should prove pessimistic in light of the County's commitment to improve Yolo County Airport.

1. Annual Operations

The forecast of annual operations for the years 2000, 2005, 2010, and 2015 are presented in Table 3-3. The forecast includes both local and itinerant operations for each of the forecast years. Total general aviation operations could increase from the current (1993) estimate of 60,000 operations to about 78,500 operations by the year 2015. This of course, represents an

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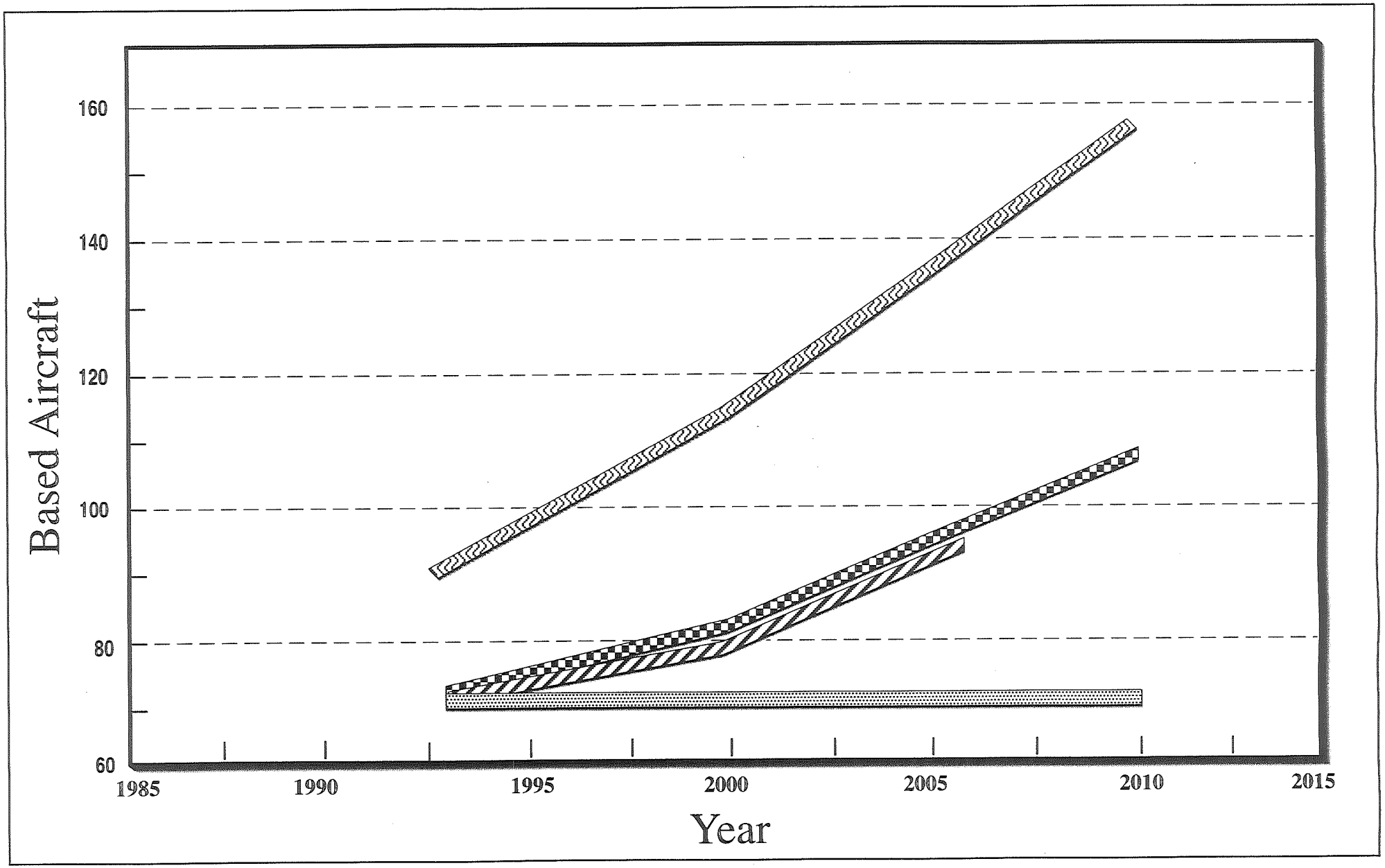
[1] No forecast of based aircraft is included in the TAF.

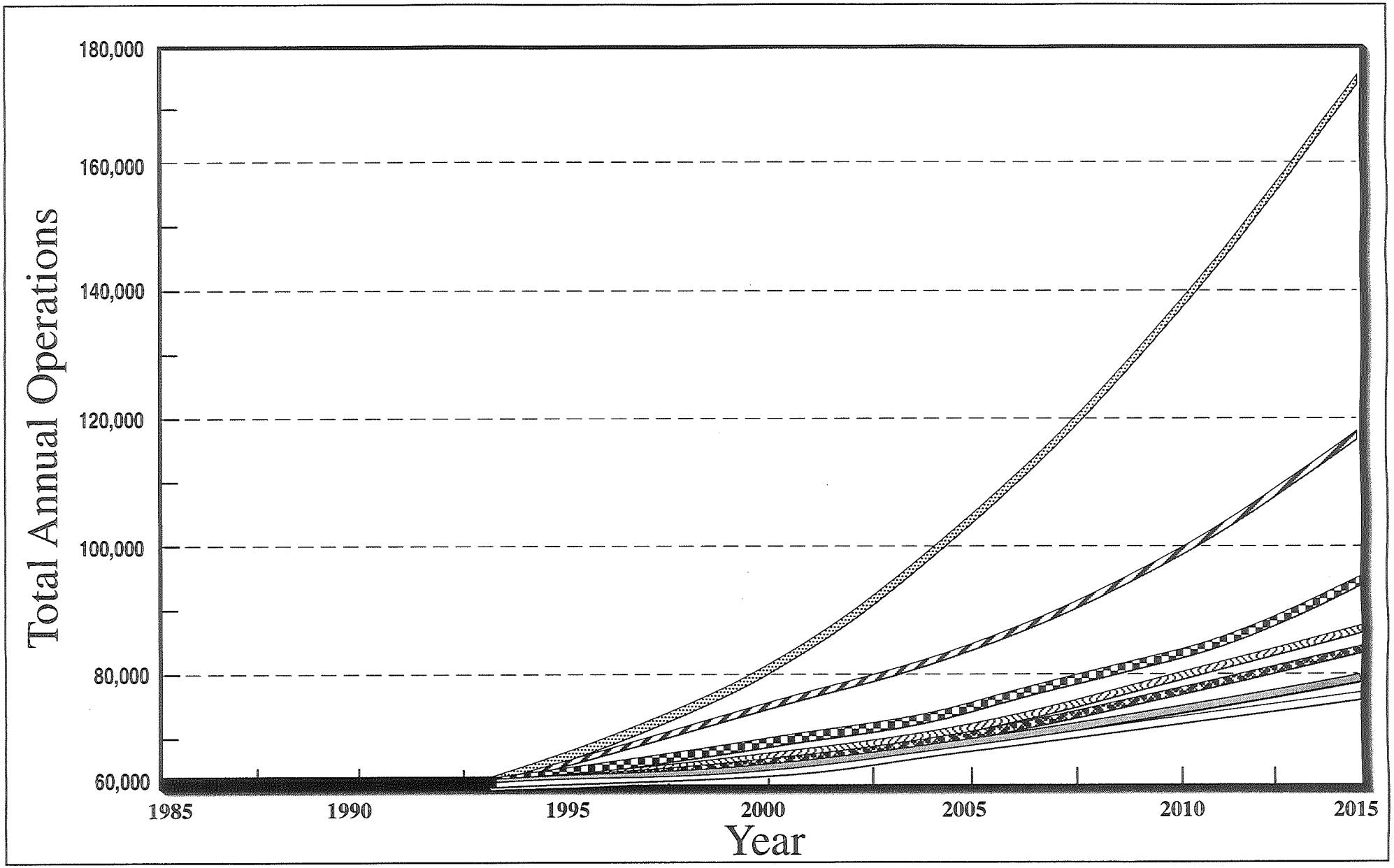


LEGEND

CASP | FAA NPIAS | 1987 Dev. Plan | 1977 Master Plan

Exhibit 3-2

Comparison of Based Aircraft Forecasts



LEGEND

Historical
3.0%
1.25/2.0/1.25%
1.0/1.5/1.0%
5.0%
2.0%
1.0/2.0/1.0%
1.0%

Exhibit 3-3

Comparison of Forecast Growth Rates

Table 3-3

AIRCRAFT OPERATIONS FORECAST -- BASE CASE

Yolo County Airport

Annual Civil Aircraft Operations

Aircraft Type	Operation Type	Actual 1993-96	2000	2005	2010	2015
S-E Prop. [1]	Local [4]	28,850	30,906	29,811	32,095	29,788
	Itinerant	16,150	16,769	21,102	22,260	26,810
	Total	45,000	47,676	50,913	54,355	56,598
M-E Prop. [2]	Local	1,050	1,152	1,260	1,379	1,472
	Itinerant	5,950	6,526	7,143	7,816	8,342
	Total	7,000	7,677	8,403	9,195	9,814
Large Prop. [3]	Local	0	0	0	0	0
	Itinerant	400	424	453	483	503
	Total	400	424	453	483	503
Turboprop	Local	0	0	0	0	0
	Itinerant	3,000	3,348	3,709	4,109	4,440
	Total	3,000	3,348	3,709	4,109	4,440
Turbojet	Local	0	0	0	0	0
	Itinerant	4,350	4,938	5,539	6,211	6,795
	Total	4,350	4,938	5,539	6,211	6,795
Rotorcraft	Local	100	106	113	121	126
	Itinerant	150	159	170	181	189
	Total	250	265	283	302	314
Total	Local	30,000	32,164	31,185	33,595	31,386
	Itinerant	30,000	32,164	38,115	41,060	47,078
	Total	60,000	64,328	69,300	74,655	78,464

Based Aircraft

Aircraft Type	Actual 1993-96	2000	2005	2010	2015
S-E Prop. [1]	57	61	65	70	76
M-E Prop. [2]	7	10	12	13	16
Large Prop. [3]	0	1	1	1	2
Turboprop	3	5	6	8	10
Turbojet	3	5	6	7	8
Rotorcraft	0	1	1	1	1
Total	70	83	91	100	113

Source: P & D Aviation

1. Light, single-engine piston propeller aircraft.
2. Light, twin-engine piston propeller aircraft.
3. Reciprocating engine aircraft over 12,500 pounds.
4. The term "local" in this context means traffic remaining in a closed pattern.

annual growth rate of 1.0 percent through 2000, 1.5 percent from 2000 to 2010 and 1.0 percent from 2010 to 2015.

2. Type of Operation

Through the year 2000, local operations are expected to remain at about 50 percent of total operations. Itinerant operations are likewise expected to remain at about 50 percent during this initial time period. It is further expected that as traffic matures over time, local operations will decline to about 45 percent of the total from 2000 to 2010, declining further to about 40 percent from 2010 through 2015.

3. Aircraft Type

Annual operations of aircraft were calculated for six classes of aircraft as shown in Table 3-3. Single engine reciprocating, propeller aircraft will continue to form the greater part of total activity through the forecast period, but are expected to grow at a gradually declining rate because the national inventory of such types is declining. Single engine aircraft operations are expected to grow from a current (1993) level of 45,000 operations to 56,500 operations by the year 2015.

Twin-engine operations are expected to grow at a rate slightly higher than the composite Base Case 1.0, 1.5, and 1.0 percent rates. Twin-engine reciprocating aircraft activity is forecast to grow from about 7,000 operations to 9,814 operations during the planning period.

A gradual increase in operations of large piston-engine aircraft (e.g. DC-3) is also forecast. Such operations currently account for about 0.7 percent of the total (400 annual operations) and will decline slightly to about 0.6 percent by 2015 (503 operations).

Turbo-prop operations (currently about 5.0 percent of total) could increase to 5.7 percent by 2015. Turbo-prop aircraft currently account for an estimated 3,000 operations. Because of the projected growth in economic activity in Yolo County, turbo-prop operations are expected to reach over 4,400 by the year 2015, representing an annual average growth rate of 1.8 percent.

Yolo County Airport is also the home of corporate turbo-jet aircraft. Locally based and itinerant turbo-jet operations currently represent an estimated 7.2 percent of the total and could rise to 8.7 percent by 2015. Turbo-jet activity could increase to as many as 6,800 annual operations by the year 2015.

Rotorcraft operations are expected to remain at less than 0.5 percent of total operations through the twenty year forecast period, amounting to about 300 operations by the year 2015.

4. Based Aircraft

Single engine propeller aircraft are expected to remain the dominant aircraft type through the planning period. The current total of 57 based aircraft is expected to grow to 76 aircraft by the year 2015, representing a declining percentage of total. Multi-engine (turbo-props and reciprocating) are expected to grow from 10 aircraft to 38 by the year 2015, a 4.8 percent annual growth rate.

Responding to the needs of corporate users doing business within the service area, based turbo-jet aircraft are expected to increase from the current three aircraft to 10 by the year 2015.

F. ENHANCED CASE FORECAST

Under the Enhanced Case forecast assumptions discussed earlier, the airport's potential to serve higher levels of sophisticated, multi-engine aircraft operations most commonly associated with corporate aviation would be accommodated. In addition, the Enhanced Case would reflect the airport's potential to capture activity from other airports either threatened with closure or constrained by physical facilities, environmental and economic conditions. Table 3-4 contains the Enhanced Case forecast values.

Drawing from the selection of a preferred Base Case, an Enhanced Case forecast was chosen which incorporates indigenous (Yolo County air service area) demand together with allowances for additional growth attributable to corporate aviation and activity derived from other regional airports. This additional demand could amount to an augmented growth increment of 0.25 percent through to the year 2000, a 0.50 percent premium from 2000 to 2010 reflecting the availability of improved facilities and instrument approach capability, and a 0.25 percent increment over the Base Case for the remaining five-year portion of the planning period. The resultant 1.25, 2.0, 1.25 percent growth curve was selected as the Enhanced Case forecast. This enhanced forecast, while more optimistic than the TAF, is nonetheless believed to be indicative of the airport's growth potential, balancing potential aviation demand with economic and environmental constraints.

The Enhanced Case forecast differs from the Base Case forecast in several ways as follows:

- Multi-engine piston operations are increased by about 13 percent.
- Turbo-prop operations are increased by an average of 20 percent.
- The turbo-jet rate of growth are increased from 2.2 to 2.6 percent.
- Single engine based aircraft are increased slightly.
- Turbo-prop based aircraft are increased.

The Base Case and Enhanced Case forecasts can be more readily compared in graphic form. Exhibit 3-4 illustrates the comparison of the two operations forecasts. A comparison of the based aircraft forecasts is illustrated in Exhibit 3-5.

Table 3-4

AIRCRAFT OPERATIONS FORECAST -- ENHANCED CASE
Yolo County Airport

Annual Civil Aircraft Operations

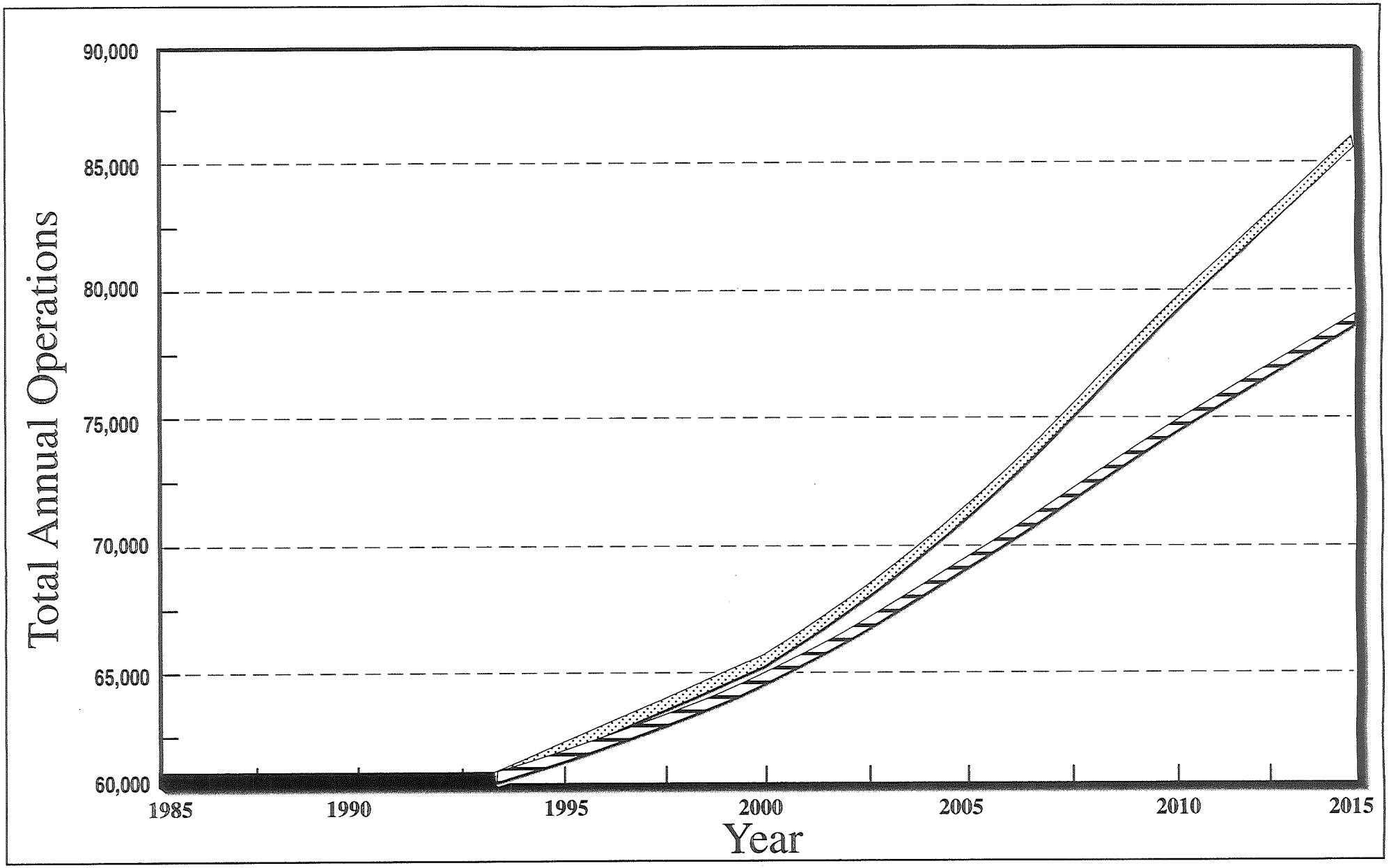
Aircraft Type	Operation Type	Actual 1993-96	2000	2005	2010	2015
S-E Prop. [1]	Local [4]	28,850	32,397	33,121	37,891	37,903
	Itinerant	16,150	18,425	24,356	27,078	33,725
	Total	45,000	50,822	57,477	64,969	71,628
M-E Prop. [2]	Local	1,050	1,248	1,464	1,717	1,963
	Itinerant	5,950	7,074	8,298	9,728	11,125
	Total	7,000	8,323	9,762	11,444	13,088
Large Prop. [3]	Local	0	0	0	0	0
	Itinerant	400	452	511	578	637
	Total	400	452	511	578	637
Turboprop	Local	0	0	0	0	0
	Itinerant	3,000	3,690	4,435	5,326	6,240
	Total	3,000	3,690	4,435	5,326	6,240
Turbojet	Local	0	0	0	0	0
	Itinerant	4,350	5,351	6,430	7,722	9,049
	Total	4,350	5,351	6,430	7,722	9,049
Rotorcraft	Local	100	113	128	144	159
	Itinerant	150	169	192	217	239
	Total	250	282	319	361	398
Total	Local	30,000	33,759	34,713	39,752	40,025
	Itinerant	30,000	35,162	44,221	50,648	61,014
	Total	60,000	68,921	78,934	90,400	101,039

Based Aircraft

Aircraft Type	Actual 1993-96	2000	2005	2010	2015
S-E Prop. [1]	57	65	74	84	96
M-E Prop. [2]	7	11	14	17	21
Large Prop. [3]	0	1	1	2	3
Turboprop	3	7	8	11	14
Turbojet	3	7	8	9	10
Rotorcraft	0	1	1	1	1
Total	70	92	106	124	145

Source: P & D Aviation

1. Light, single-engine piston propeller aircraft.
2. Light, twin-engine piston propeller aircraft.
3. Reciprocating engine aircraft over 12,500 pounds.
4. The term "local" in this context means traffic remaining in a closed pattern.



LEGEND

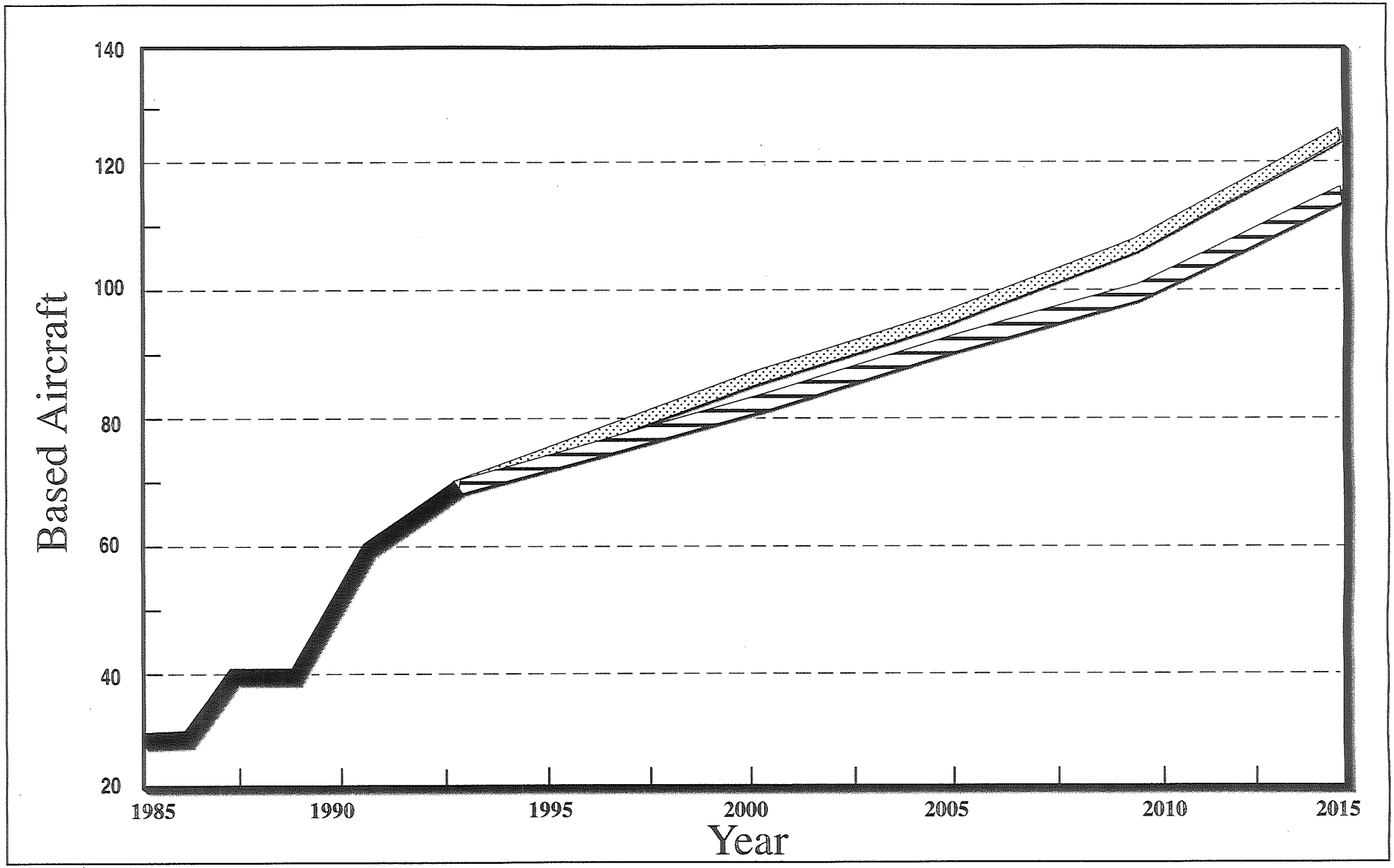
Historical

Base Case

Enhanced Case

Exhibit 3-4

Forecast Comparison - Operations



LEGEND

Historical | Base Case | Enhanced Case

Exhibit 3-5

Forecast Comparison - Based Aircraft

SECTION 4
DEMAND/CAPACITY ANALYSIS

SECTION 4
DEMAND CAPACITY ANALYSIS

A. INTRODUCTION

An analysis of airport capacity provides important information concerning airport facilities requirements in terms of runway orientation, runway length, taxiway configuration, siting constraints and general geometric standards. The analysis of aircraft operational requirements allows the determination of runway/taxiway dimensions, strengths, and lateral clearances between operating areas. These analyses are interrelated and must be accomplished simultaneously in order to determine facilities requirements.

B. CAPACITY METHODOLOGY UTILIZED

An analysis of airport capacity leads to a determination of how much (and when) additional capacity might be required at some future date to accommodate forecast aviation demand. Three distinct elements require investigation: (1) the airfield, (2) the aircraft basing and service area, and (3) the airspace.

The maximum airport capacity will depend on the capacity limitations in any of these three elements. A fourth element, ground access, must also match the capacity of the other three. This capacity analysis is intended to produce information concerning the airfield, airspace and aircraft basing/service area which is then used in a determination of the adequacy of existing facilities to meet existing and forecast demand.

1. The Airfield

Airfield capacity is the rate of aircraft movements on the runway/taxiway system which results in a given level of delay. There are two principal expressions for airfield capacity (1) annual service volume and (2) throughput capacity. As defined by the FAA, [1] annual service volume (ASV) is a reasonable estimate of an airport's annual operations capacity. It accounts for differences in runway use, aircraft mix, weather conditions and so forth, which would be encountered over the course of a year. Throughput capacity is a measure of the maximum number of aircraft operations which can be accommodated on the airport or airport component (i.e., runway complex, aircraft basing/service area, etc.) in an hour. Since the capacity of an airport component may be constrained by the capacities of the other components, it can be calculated separately for each. Traditionally, at airports serving primarily light aircraft, annual capacity is reached when delays to departures average two minutes for the peak hour of the week.

2. Aircraft Basing/Service Area

The capacity of the area dedicated to aircraft storage and services correlates with its ability to accept the aircraft and related activities that the airfield accommodates. After determining the airfield capacity, the capabilities and limitations of the aircraft basing/service area can be estimated.

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[1] FAA Advisory Circular 150/5060-5, Airport Capacity and Delay.

3. Airspace

Airspace capacity is the ability of the airport's surrounding operational airspace to accommodate the types and frequencies of aircraft that desire to use the airport during periods of good and poor visibility.

The relative locations of other airfields, the relationship of runway alignments, and the nature of operations (IFR and VFR) are the principal inter-airport considerations which will affect the overall capacity of the airspace used by aircraft operating into and out of Yolo County Airport. For example, it is important that no two airports are located so near each other that they share one discrete parcel of airspace. In such cases there may be a reduction in IFR (and, in some cases VFR) capacity for the airports involved due to the intermixing of traffic within the common parcel of airspace. When this occurs, aircraft, regardless of destination, must be sequenced with the proper separation standards. This reduces the IFR capacity for a specific airport.

4. Ground Access

Having determined the capacity available from the airfield, terminal area and airspace, the critical capacity (the lesser of the three capacities) should be compared with the capacity to accept surface movements by people and access vehicles.

The availability of ground access capacity is a key factor in the utility of a public use airport. The prospect of increasing use of the airport by larger, more sophisticated corporate aircraft (see Section 3, Aviation Demand Forecasts) suggests the importance of ground access considerations.

5. Air Traffic Control/NAVAIDS

With the prospect of growing usage by corporate aircraft, the demand forecasts for Yolo County Airport suggest the types of navigation aids that could be needed in future years. The airspace available, the volume of traffic projected, and the nature of the operations (IFR and VFR) that could be expected are the determining factors. These considerations are given further attention in the analyses of facilities requirements as set forth in Section 5.

6. Airspace Utilization

Yolo County Airport is an non-tower airport; that is, there is no provision for an Airport Traffic Control Tower (ATCT). However radar advisory services are provided by the radar approach control facility (RAPCON) at Travis Air Force Base. Additional flight advisory services are provided by the FAA's Rancho Murieta Flight Service Station (FSS). Local airspace is depicted on Exhibit 4-1.

Left-hand VFR traffic patterns are used for Runway 34 and right-hand patterns for Runway 16. Thus, all pattern traffic overflies the airport's west side for noise abatement and other operational purposes. Both Runways 16 and 34 are used during periods of calm winds, although Runway 34 is preferred for tailwinds below 5 knots.

The airport is also a host to skydiving activities, particularly on weekends. In addition, aerial applicators utilizing a midfield location on the airport's west side operate using non-standard traffic patterns and altitudes.

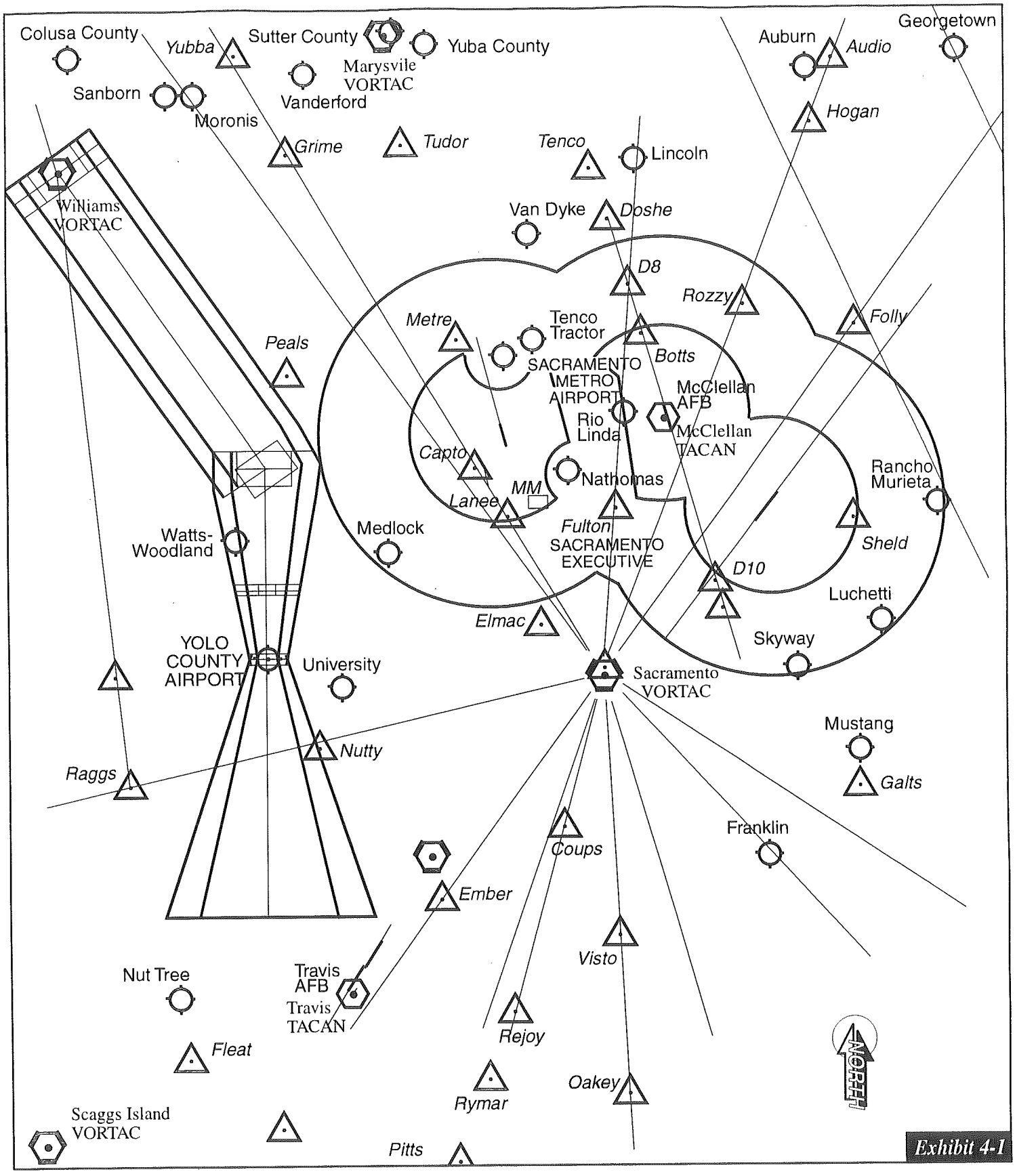

Exhibit 4-1

Local Airspace Environment

The capability of Yolo County Airport to serve aircraft during IFR may become an important consideration in serving the forecast increase in corporate aviation and other operators of sophisticated aircraft. In addition, the availability of a non-precision instrument approach procedure could provide a valuable additional margin of safety during low visibility conditions, particularly in view of the proximity of nearby residences.

Currently there are no published instrument approach (or departure) procedures for the airport. As can be seen on Exhibit 4-1, however, the surrounding local airspace appears to offer the potential for viable instrument procedures based upon the separation of the Yolo County Airport from other nearby facilities. On the assumption that Runway 16 could be used for non-precision instrument approaches, the only apparent potential conflict would involve instrument departures or missed approaches in IFR interacting with U.C. Davis arrivals.

7. Aircraft Fleet Mix Considerations

Table 4-1 sets forth the forecast (years 2000 and 2015 Base Case) fleet composition. The table also presents the aircraft classes defined by the FAA for use in the computation of airfield capacity.

Under the Enhanced Case forecast, the percentages of classes B and C aircraft exceed the Base Case percentages, reflecting the assumption of higher utilization by corporate aircraft. However, under the Enhanced Case assumptions of demand, the rounded percentages of classes A, B and C aircraft differ from the base case by amounts which, though very important, are otherwise immaterial in the computation of airfield capacity. Thus, the resultant capacity under the Enhanced Case would be of essentially the same consequence as under the Base Case.

8. Meteorological Factors

Airfield capacity is influenced by meteorological factors, particularly winds. The percentage use of each runway end for departures and arrivals by each aircraft class is significant in that this utilization can affect the computation of airfield capacity. The relative locations of exit taxiways further affect these computations.

Percentage runway use can be determined either by analyzing a wind vector diagram (wind rose) or raw data. The only source of recorded information on wind speed and direction currently available pertains to the Sacramento Metro Airport. This wind data reflects observations over a 14-year period from 1951 to 1960 and from 1968 through 1972. Although these data reflect observations at a facility some 16 nautical miles distant, the absence of hills and other major intervening surface irregularities suggests that the wind observations are sufficiently valid to permit inferences regarding the adequacy of the Runway 16-34 orientation.

Table 4-2 sets forth the runway end use percentages based on the FAA crosswind criteria. These data show that Runway 16 experiences a higher percentage of head winds than Runway 34. The percentages given for Runway 34 represent the annual average percentage of time when that runway must be used because of tailwind restrictions. Table 4-2 sets forth crosswind coverage based on the 10.5-knot (12 mph) criterion. The data in Table 4-2 also reflects crosswind criteria of 13 knots (15 mph) for higher- performance aircraft. Note, however, that Runway 34 is the preferred runway for takeoffs during conditions with tailwind components less than five knots.

Table 4-1

FORECAST FLEET MIX COMPOSITION

A/C Type	Class	Annual Operations			
		No.	%	No.	%
Turbojet	C	4,938	7.7	6,795	8.7
Lg. Turboprop	C	1,674	2.6	2,220	2.8
Lg. Multi-Eng.	C	424	0.7	503	0.6
Sm. Turboprop	B	1,674	2.6	2,220	2.8
Muti-Eng. Prop.	B	7,677	12.0	9,814	12.6
Sgl.- Eng Prop	A	47,676	74.4	56,598	72.4
Totals		64,063	100	178,150	100

Class D Aircraft - over 300,000 lbs. maximum takeoff weight. None are forecast

Class C Aircraft - 12,500 to 300,000 lbs. maximum takeoff weight.

Class B Aircraft - under 12,500 lbs. maximum takeoff weight (multi-engine)

Class A Aircraft - under 12,500 lbs. maximum takeoff weight (single -engine)

Table 4-2

ALL WEATHER WIND COVERAGE

Crosswind Component	Runway 16	Runway 34	All Runways
10.5 Knots	66.60%	38.00%	92.80%
13 Knots	69.50%	40.30%	98.10%

Note : If Runway 16 is the preferred calm wind runway, then the analysis indicates that Runway 34 must be used 38 % and 40 % of the time under the 10.5 and 13 knot criteria, respectively.

The 10.5-knot criterion applies to corporate turboprop and other general aviation aircraft under 12,500 pounds. The 13-knot criterion applies to turbojet and other higher-performance aircraft larger than 12,500 pounds.

C. COMPUTATION OF AIRFIELD CAPACITY

Both ASV (annual) and throughput (hourly) capacity must be evaluated in order to assess the adequacy of the existing airfield.

1. Computational Parameters

In addition to the determination of aircraft mix set forth in the previous discussion, the following computed and measured parameters will assist in the calculation of airfield capacity.

Percent IFR Weather. Cloud ceiling between 600 feet and 1,000 feet and/or visibility of between 1 and 3 miles assumed at five percent of the time. [1]

Aircraft Mix Index. Projected Base Case 2000 conditions -- C+3D = 11.0%; 2015 Base Case -- C+3D = 12.2%. Note that computed capacities for the Enhanced Case mix scenario will immaterially lower than those for the Base Case mix.

Percent Arrivals (PA). Assumed at 50%.

Percent Touch-and-Gos. Based on current estimated conditions -- 50% (T&G) from 1993 to the year 2000, declining to 40% by the year 2015. For simplification, this figure presumes that all local operations are touch-and-gos through the year 2015.

Runway Use Configuration. Runway use diagrams depicting two existing and two speculative operational regimes at the airport are shown on Exhibit 4-2. Southerly flows are assumed to occur in parallel with the wind analysis set forth in Table 4-2. For computational purposes, the percentages of southerly and northerly flows were rounded to 70% and 30%, respectively. [2] Configurations 1A and 1B pertain to the existing airfield. Configurations 2A and 2B assume future development of a new parallel taxiway and two new angled connecting taxiways as illustrated.

2. Computed Airfield Capacities

The airfield capacities associated with combined southerly and northerly traffic flows are summarized in Table 4-3. This table reflects the most recent computation of "existing" airfield geometry using the FAA's manual computation procedures. [3] The computed IFR capacities assume the speculative future availability of published instrument approach and departure

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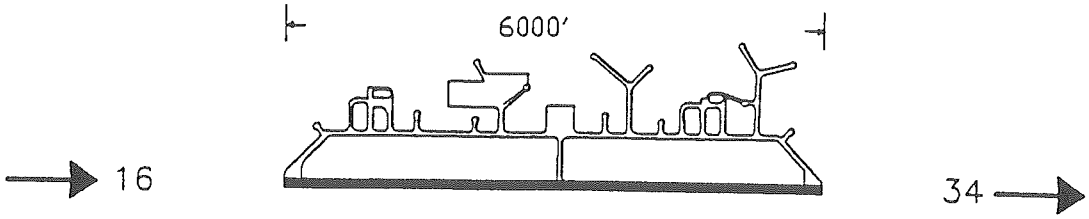
[1] This assumed IFR percentage takes into account the predictable occurrence of low visibility conditions prevalent in Winter months.

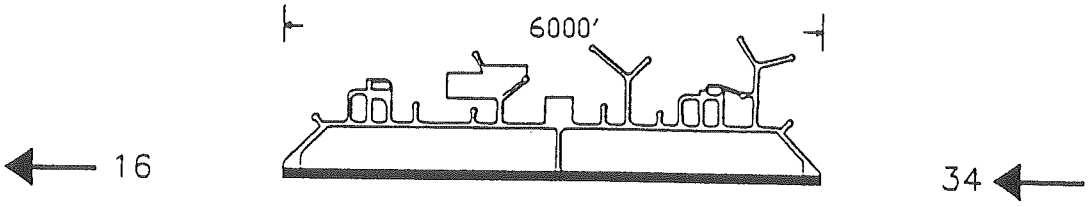
[2] Percentage runway use is largely determined by prevailing winds. In the absence of data, runway use is assumed to be comparable to observations at Sacramento Metro Airport.

[3] AC 150/5060-5 Op. Cit.

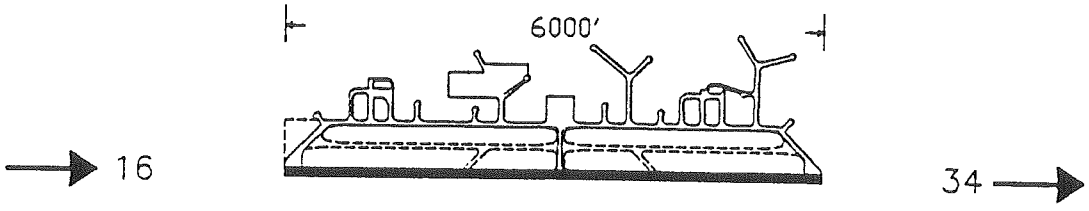
Configuration 1A: 70%



Configuration 1B: 30%



Configuration 2A: 70%



Configuration 2B: 30%

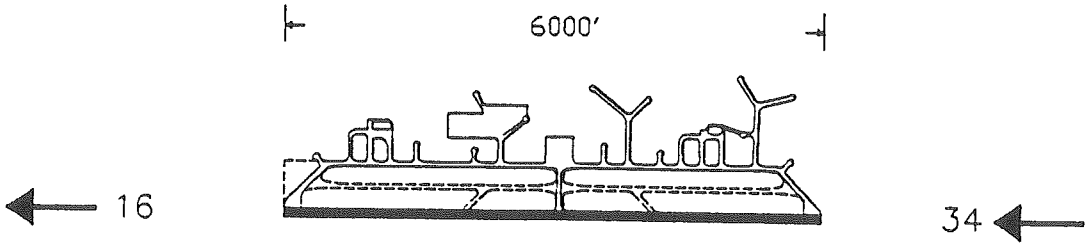


Exhibit 4-2

Runway Capacity Use Diagrams

Table 4-3

COMPUTED VFR AND IFR CAPACITIES

	Hourly Capacity		ASV
Airside Configurations	VFR Ops/Hr.	IFR Ops/Hr.	Ops/Yr.
Existing	95-105	55-60	<230,000
Configuration 2	98-110	59-62	>230,000

Notes : 1. IFR operations assumesthe availability of instrumentation. Also assumes absence of demand during periods when visibility minima are not met.

2. Existing configuration includes Configurations 1A and 1B (existing R/W & T/W system)
3. ASV operations for existing configurations corresponds to hourly range with 40 to 50 percent of local operations.
4. Five year (year 2,000) and 20 year (year 2015) capacities for the Configuration 2, are essentially equal despite higher percentage of Class B and C aircraft. Capacities are based on improved R/W and T/W Configuration 2A / 2B. See Exhibit 4-3

procedures. With the absence of such procedures, the IFR capacities for the existing airfield (Configuration 1A/1B) are minimal.

3. Hourly Capacity

Existing Airfield and Fleet Mix. As noted in Table 4-3, VFR hourly capacity is in the range of 95 to 105 operations per hour. This capacity level far exceeds the peak demand level of about 12 to 18 operations. IFR capacity (55 to 60 operations) would likewise be far in excess of demand if instrument procedures were available. The existing airfield is depicted in Exhibit 4-2 as Configuration 1A/1B.

Existing Airfield and Forecast Fleet Mix. The percentage of Class C aircraft is most influential in the computation of hourly capacity. Under forecast fleet mix assumptions, the hourly capacities computed under existing conditions are also applicable to forecast demand conditions on the existing airfield. Forecast peak-hour VFR demand could be as high as 13 to 20 operations per hour by the year 2015, well below nominal peak-hour VFR capacity. Much of the forecast peak-hour VFR demand is expected to continue to be local traffic.

Clearly, forecast peak-hour demand is well below both VFR and IFR hourly capacity through the year 2015. Current VFR capacity reflects the availability of a full parallel taxiway with a single mid-field connecting taxiway.

Configuration 2A/2B envisions development of a new parallel taxiway and new connecting taxiways to improve runway occupancy times of importance during peak demand periods and to enhance operational safety and flexibility as traffic continues to grow as forecast.

4. Annual Capacity

Existing Fleet Mix. The annual service volume based on the assumptions set forth for existing operations is fractionally less than the nominal (230,000 operations) capacity for a single runway with good, but less than ideal taxiway configuration and the current demand fleet mix. Annual service volume generally represents the greatest number of operations which could be accommodated without regard to delay or level of service.

Forecast Fleet Mix. The annual service volume based on the assumptions set forth for the Base Case forecast [1] scenario of operations is fractionally greater than the nominal 230,000 operations. This fractionally higher ASV reflects the assumption of two new connecting taxiways, ideally located between the Runways 16 and 34 thresholds and the existing mid-field connecting taxiway. This figure is computationally unaffected by the prospective introduction of greater numbers of corporate aircraft beyond the five year planning horizon [2] under both the base and enhanced forecasts.

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[1] Computed capacity for the Enhanced Case forecast is essentially the same.

[2] Although the Enhanced Case forecast emphasizes the potential for corporate aviation and declining roles of other regional airports. Increases in corporate activity are also envisioned under the Base Case.

D. CONCLUSION

The ASV (i.e., capacity) exceeds projected demand under both the Base Case and Enhanced Case by a considerable margin.

SECTION 5
ALTERNATIVES AND FACILITIES REQUIREMENTS

SECTION 5
ALTERNATIVES AND FACILITIES REQUIREMENTS

This report section discusses alternative airport design criteria and derivative alternate setback and aircraft operating area requirements at Yolo County Airport

A. INTRODUCTION

Based on the aviation demand considerations as discussed in Section 3, the airport is expected to continue to serve its role as a general aviation facility through the long term (20-year) planning period. As explained in Section 4, Demand/Capacity Analysis, the existing airfield provides sufficient annual and hourly capacity to function in this service role.

However, in order to optimize the utility of the airfield and landside facilities, certain improvements are proposed for the parallel taxiway and connecting taxiways. In addition, reuse of the existing parallel taxiway as an apron taxilane is proposed to facilitate aircraft circulation among the various uses on the airport's east side.

Two principal design issues which are addressed herein include:

- The classification and design standards most appropriate for the airfield; and,
- The appropriate setback dimensions for a future airport administrative complex and building area development.

B. AIRPORT DESIGN STANDARDS

1. Airfield Classification.

Since publication of the previous Master Plan study (1976/77) and Airport Development Plan (1987), the FAA has developed new standards for the design of airports which associate physical and operational characteristics of aircraft (including weight, wingspan and approach speed) with airfield dimensional characteristics.[1] A new Airport Reference Code (ARC) system replaces the older "Basic Utility", "General Utility" and "Transport" nomenclature used to designate a runway classification. The ARC system uses a two element code consisting of a letter and roman numeral corresponding to the Aircraft Approach Category and Airplane Design Group characteristics, respectively as follows:

Aircraft Approach Category (Speed)

A	< 91 knots
B	91 knots - 121 knots

1. *FAA Advisory Circular 150/5300-13, "Airport Design," 1989, as amended*

C	121 knots - 141 knots
D	141 knots - 166 knots
E	> 166 knots

Airplane Design Group (Wingspan)

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

Design of runways and related facilities are generally predicated on the Aircraft Approach speed Category. Separation criteria and other airfield geometric standards involving taxiways and taxilanes are generally predicated on the Airplane Design Group. Under most circumstances, an airport should be designed to the highest set of standards needed to accommodate the most demanding aircraft (termed the "critical" aircraft) likely to use the facility on a regular basis in the future. This objective must be balanced against the costs -- both in dollars and in the loss of opportunity to utilize available land for other competing purposes.

Strictly interpreting current FAA criteria, the Yolo County Airport now functions as a B-I airport wherein some 90 percent of operations involve aircraft with wingspans less than 49 feet and approach speeds less than 121 knots. However, the airport also serves over 10,000 annual operations of large aircraft which fall into Approach Categories "B" and "C" and Airplane Design Group "II."[2] Thus, the Airport currently functions under a "dual" classification, accommodating considerable activity of both light and larger, higher-performance aircraft.

2. General Design Criteria.

The FAA standards pertaining to runway length, pavement strength, and runway and taxiway clearances were extensively revised in 1983. The standards vary depending upon the Airport's specific operating conditions (e.g., elevation, average maximum temperature, type of approach) and the characteristics of the aircraft which regularly use the facility or are expected to do so.

The following discussion highlights the important factors used to determine the appropriate classification and design standards applicable to Yolo County Airport.

Airport Role. As described in Section 3, Aviation Demand Forecasts, the Airport's air service area generates a considerable and growing demand for facilities serving corporate aircraft. Most

2 *PreStar Aviation's Beech KingAir accounts for approximately 6,000 annual operations, and Woodland Aviation operates a Beech Starship and other high performance aircraft.*

of these corporate aircraft operations involve large turboprop and turbojet aircraft, commonly referred to as "transport" category aircraft.[3]

Thus, an important element of this Master Plan is an evaluation of current airfield facilities with the purpose of identifying design deficiencies and issues under the assumption that the airport will continue to serve the full range of demand generated within the Yolo County Airport service area.

Critical Aircraft. In addition to serving transient corporate aircraft on a regular basis, the Airport also has based corporate jet aircraft. These fall within ARC B-II and C-II categories. Recognizing the need to properly serve operations of these large aircraft, several alternatives have been considered which would provide for safe and efficient operations of these critical aircraft types as well as the full range of lighter aircraft which regularly use the Airport.

With the exception of heavily loaded jet aircraft operating on hot days, the current runway length is sufficient to accommodate existing and forecast aircraft operations and does not seriously constrain aircraft operations under usual climatological conditions. Moreover, the majority of aircraft that currently use the Airport are light single-engine and twin-engine types, typically weighing less than 12,500 pounds. These types represent 90 percent of all operations while the remainder include the Beech Super King Air B200, DHC-6 and the aforementioned turbojets.

In view of the regular use of the Airport by corporate aircraft, perhaps the most conspicuous deficiency of the airfield is the absence of a published instrument approach procedure. Thus, the Master Plan must ultimately determine which ARC code is most appropriate to serve future operations set forth in the Aviation Demand Forecasts and must also consider alternative means to accommodate demand during periods of low ceilings and reduced visibility.

Existing Runway. Runway 16-34 is 6,000 feet in length and was temporarily configured with displaced landing thresholds on both ends at the beginning of this Master Plan The landing thresholds were displaced by approximately 200 feet to roughly coincide with the filleted pavement edge of the connecting taxiways at each runway end. Thus, as originally marked, Runways 16 and 34 offered approximately 6,000 feet for takeoff and 5,800 feet for landing.

The need for threshold displacement was probably tied to the condition of PCC pavement in the portion of the holding aprons at both ends which also serve as runway pavement. A resurfacing project, jointly funded by the County and FAA, designed to remedy wearing surface problems associated with the PCC pavement was completed in the summer of 1995. This project established the full 6,000 feet of runway pavement for both takeoffs and landings. As part of this project, the Runway 16-34 thresholds were re-marked in accordance with FAA standards

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3. *FAA defines "Transport Aircraft" as those weighing in excess of 12,500 lbs. maximum gross takeoff weight.*

C. ALTERNATIVES CONSIDERED

In order to better evaluate alternative ARC classifications for Yolo County Airport, the activity levels, approach capability, and existing dimensions of the existing airfield were reviewed relative to current FAA standards.

In addition to the existing configuration (ARC), the following six study alternatives were considered to balance the costs and other implications of serving forecast aircraft operations.

Alt.	A/P Ref. Code	Approach Type
A	B-I	Visual
B	B-II	Visual
C	B-II	NPI[3]
D	B-II	NPI[4]
E	C-II	Visual
F	C-II	NPI[3]
G	C-II	NPI[4]

The design criteria applicable to each of the study alternatives described below are summarized in Table 5- 1.

1. Alternative A --B- I Existing Visual Runway

The existing runway and taxiway system (including runway length/width, taxiway width and the runway/parallel taxiway separation) would remain the same. The landing thresholds on each end of the runway would remain at the physical ends of runway pavement.[54] The full 6,000 foot length would be available for arrivals and departures. The calculated FAR Part 77 Building Restriction Line (BRL) for a 25' structure is well within the existing airport property line and lies clear of the Fire Station on the airfield's west side. The RPZs for both runway ends extend beyond fenced airport property.

This alternative accommodates the current aircraft fleet without provision of an instrument approach procedure. Study Alternative A is illustrated in Exhibit 5-1.

2. Alternative B -- B-II Visual Runway

In terms of physical facilities, this alternative is identical to Alternative A. Alternative B would establish design setbacks, FAR Part 77, and runway protection zone (RPZ) dimensions to

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3. Non-precision Instrument with visibility minimum greater than 3/4 mile.

4. Non-precision Instrument with visibility minimum as low as 3/4 mile.

5. Landing thresholds were temporarily displaced 200 feet at each end and were reverted to the physical ends of the runway upon completion of pavement resurfacing by the end of 1995.

Table 5-1
ALTERNATIVE DESIGN CRITERIA COMPARISON

Study Alternative		A	B	C	D	E	F	G
Approach Category		B	B	B	B	C	C	C
Airplane Design Group		I	II	II	II	II	II	II
Typical Design Aircraft		KingAir A90	Cit II/III,Falcon 20/50/90, G-I			Sabre 30, CL 6500, G-III, Jetstar		
Design Aircraft Runway Length		3800 [1]	4400 [2]	5300 [3]	5800 [4]	5300 [3]	5800 [4]	7300 [5]
Proposed Runway Length		6000	6000	6000	6000	6000	6000	6000
Runway Category		Utility	Other Than Utility			Other Than Utility		
Runway Type	Primary En	Visual	Visual	NP > 75	NP > 75	Visual	NP < 75	NP > 75
	Other End	Visual	Visual	Visual	Visual	Visual	Visual	Visual
FAR Part 77 Obstruction Surfaces								
Horizontal Surface Radius		5000	5000	10000	10000	5000	10000	10000
Primary Surface Width		250	500	500	1000	500	500	1000
Approach Surface-Critical End								
Inner		250	500	500	1000	500	500	1000
Outer		1250	1500	3500	4000	1500	3500	4000
Length		5000	5000	10000	10000	5000	10000	10000
Slope		20:1	20:1	34:1	34:1	20:1	34:1	34:1
Building Restriction Line								
10' Structure		195	320	320	570	320	320	570
15' Structure		230	355	355	605	355	355	605
20' Structure		265	390	390	640	390	390	640
25' Structure		300	425	425	675	425	425	675
Runway Setbacks								
R/W Centerline to :	Hold Lin	125	200	200	200	250	250	250
	Parallel T/	150	240	240	240	300	300	300
	Acft. Parkin	125	250	250	250	400	400	400
Taxiway & Taxilane Setbacks								
T/W Centerline to:	Parallel. T/W &	69	105	105	105	105	105	105
	Fixed/Movable Obje	44.5	65.5	65.5	65.5	65.5	65.5	65.5
Runway Protection Zone								
Primary End (R/W 16)								
Inner		250	500	500	1000	500	500	1000
Outer		450	700	1010	1510	700	1010	1510
Length		1000	1000	1700	1700	1000	1700	1700
Other End (R/W 34)								
Inner		250	500	500	1000	500	500	1000
Outer		450	700	700	1100	700	1010	1100
Length		1000	1000	1000	100	1000	1700	1000
Runway Design								
Obstacle Free Zone -	Widt	250	400	400	400	400	400	400
	Lengt	200	200	200	200	200	200	200
Runway Width		60	75	75	75	100	100	100
Runway Shoulder		10	10	10	10	10	10	10
Blast Pad	Wi	80	95	95	95	120	120	120
	Lengt	60	150	150	150	150	150	150
Runway Safety Area	Width	120	150	150	150	400	400	400
	Lengt	240	300	300	300	1000	1000	1000
Object Free Area	Widt	250	300	500	500	800	800	800
	Lengt	300	600	600	600	1000	1000	1000
Taxiway Design								
	Widt	25	35	35	35	35	35	35
	Safety Area Widt	49	79	79	79	79	79	79
	Object Free Area Widt	89	131	131	131	131	131	131
-	Taxilane Object Free Area Widt	79	115	115	115	115	115	115

Source: FAA AC 150/5300-13

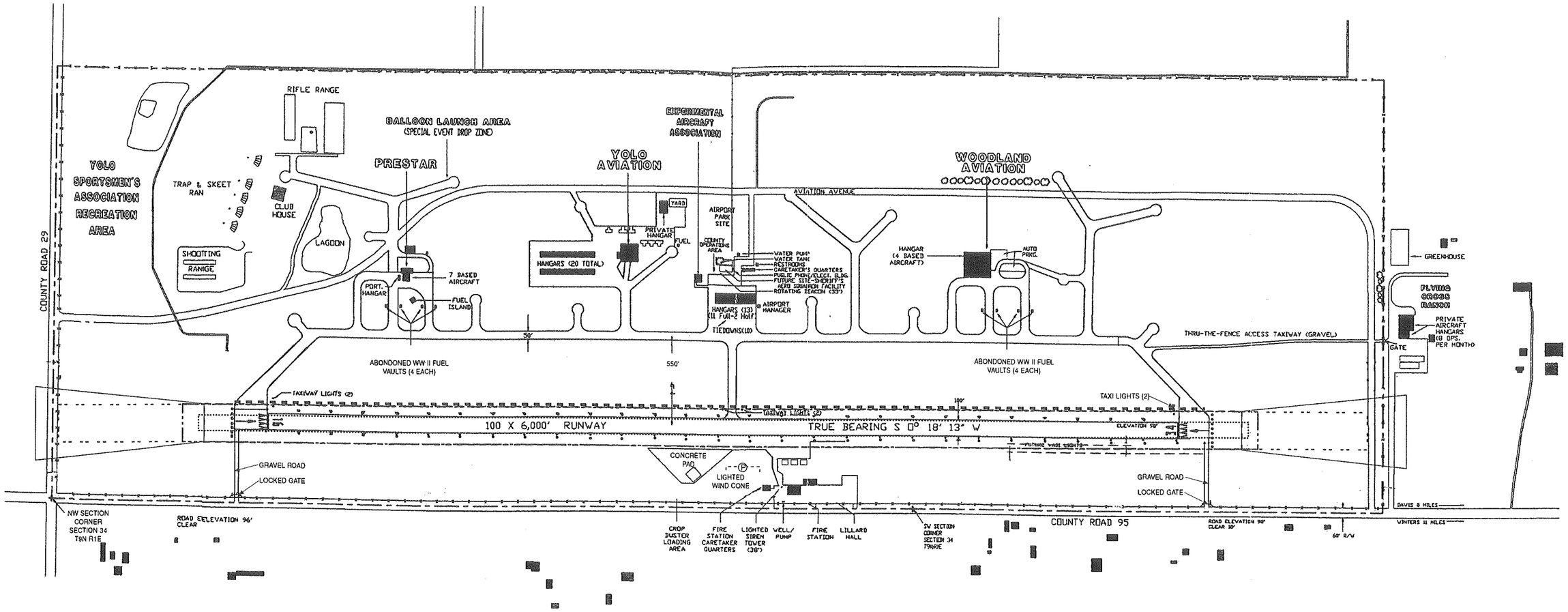
[1] Serves small airplanes with less than 10passengers

[2] Serves small airplanes with 10 or more passengers

[3] Serves 75% of large airplanes of 60,000 lbs. or less @ 60% load

[4] Serves 100% of large airplanes of 60,000 lbs. or less @ 60% load

[5] Serves 75% of large airplanes of 60,000 lbs. or less @ 90% load



NORTH

0 500 1000 1500

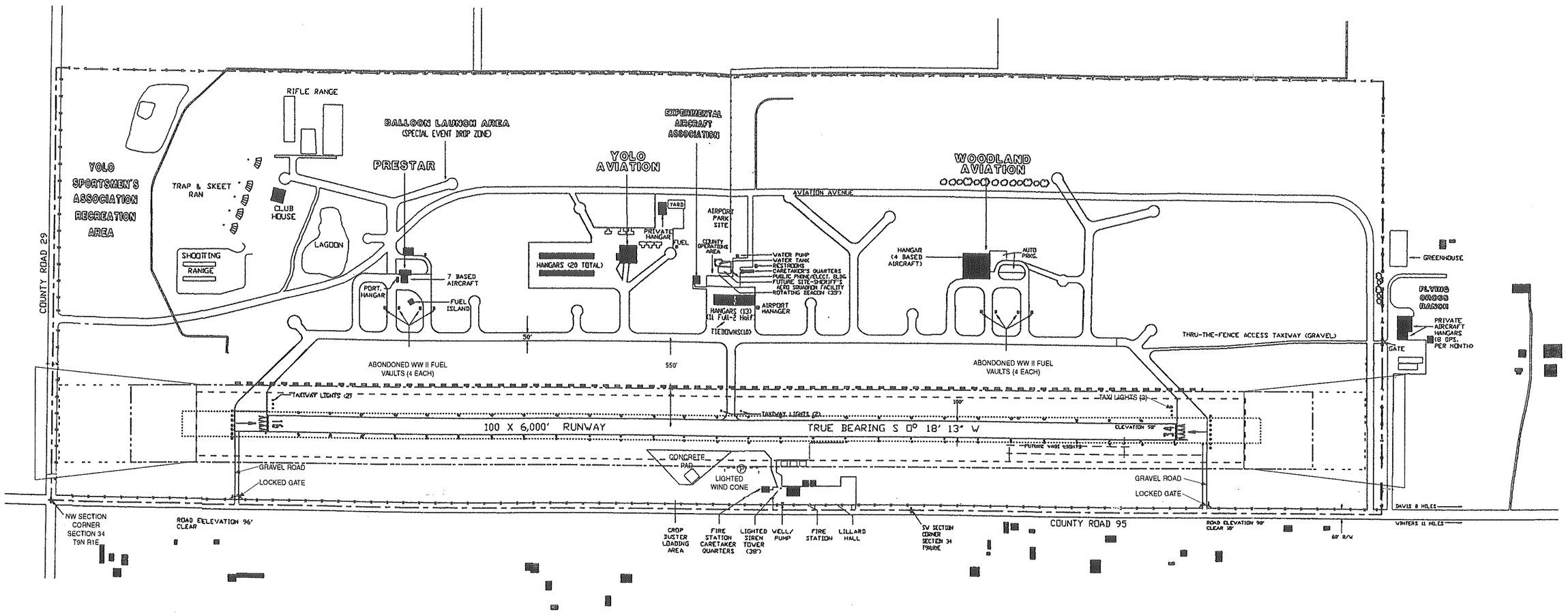
Scale in feet

Study Alternative A
Aircraft Approach Category: B (91-121 knots)
Airplane Design Group: I (less than 49' wingspan)
Runway Category: Small, light aircraft
Runway Type: Visual/Visual

- Obstacle Free Zone (OFZ)
- Object Free Area (OFA)
- Aircraft Parking Limit Line
- Parallel Taxiway Setback
- Runway Safety Area (RSA)
- Runway Protection Zone (RPZ) and FAR 77 Primary Surface

Exhibit 5-1

Study Alternative A



NORTH

0 500 1000 1500

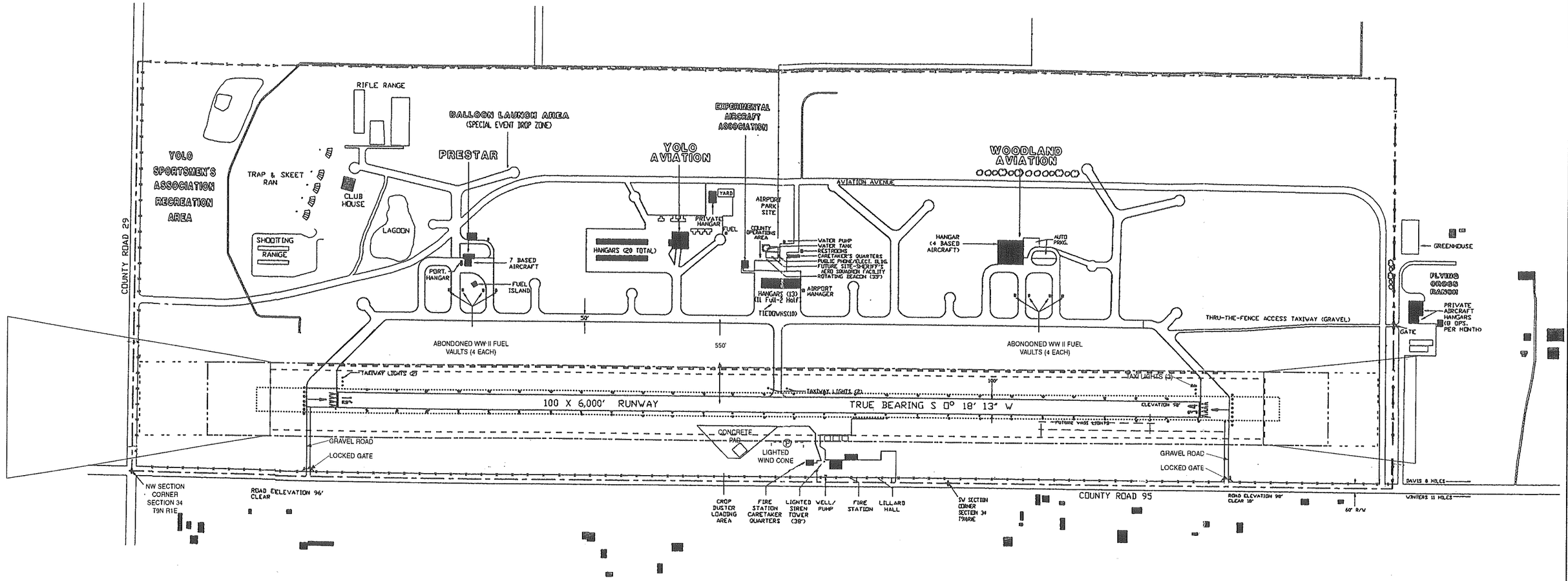
Scale in feet

Study Alternative B
Aircraft Approach Category: B (91-121 knots)
Airplane Design Group: II (49'-79' wingspan)
Runway Category: Large, higher-performance aircraft
Runway Type: Visual/Visual

- Obstacle Free Zone (OFZ)
- Object Free Area (OFA)
- Aircraft Parking Limit Line
- Parallel Taxiway Setback
- Runway Safety Area (RSA)
- Runway Protection Zone (RPZ) and FAR 77 Primary Surface

Exhibit 5-2

Study Alternative B



NORTH

0 500 1000 1500
Scale in feet

Study Alternative C
Aircraft Approach Category: B (91-121 knots)
Airplane Design Group: II (49'-79' wingspan)
Runway Category: Large, higher-performance aircraft
Runway Type: NP >.75/Visual

- Obstacle Free Zone (OFZ)
- Object Free Area (OFA)
- Aircraft Parking Limit Line
- Parallel Taxiway Setback
- Runway Safety Area (RSA)
- Runway Protection Zone (RPZ) and FAR 77 Primary Surface

Exhibit 5-3

Study Alternative C

conform with ARC B-II. As with Alternative A, the 25-foot BRL lies entirely within existing airport property. However, the BRL has been repositioned to reflect a 500-foot wide FAR Part 77 primary surface [Alternative A used 250 feet] and corresponding widening of the RPZ. No existing airport uses conflict with the ARC B-II criteria. This alternative also accommodates the current aircraft fleet without provision of an instrument approach procedure. Alternative B is illustrated in Exhibit 5-2.

3. Alternative C -- B-II Runway Upgraded with a Non-precision Instrument Approach

Except for the provision of a non-precision instrument approach with visibility minima greater than 3/4 mile for Runway 16, this alternative is physically similar to Alternative B. The proposed instrument approach, however, would require that the runway protection zone (RPZ) for Runway 16 end, be enlarged from its present dimensions of 250'x450'x1000' to 500'x1010'x1700'. The RPZ for Runway 34 would be the same as for Alternative B (500'x700'x1000'), extending almost 100 feet south of Airport property.

The 700-foot expansion of the Runway 16 RPZ would extend north beyond Airport property. The Airport would be required[5] to establish control over the creation of obstructions within the enlarged RPZ through fee acquisition or through an avigation easement in the subject property. Alternative C is illustrated in Exhibit 5-3.

4. Alternative D -- B-II Runway Upgraded with a Superior Non-precision Instrument Approach

This alternative provides an instrument approach to Runway 16 with visibility minima as low as 3/4 mile. FAA criteria for this Approach Category would require enlargement of the primary surface and obstacle free area to a width of 1,000 feet. As illustrated in Exhibit 5-4, this alternative would extend the 10-foot BRL beyond County Road 95 and would require relocation of structures on the Airport's west side (including the fire station).

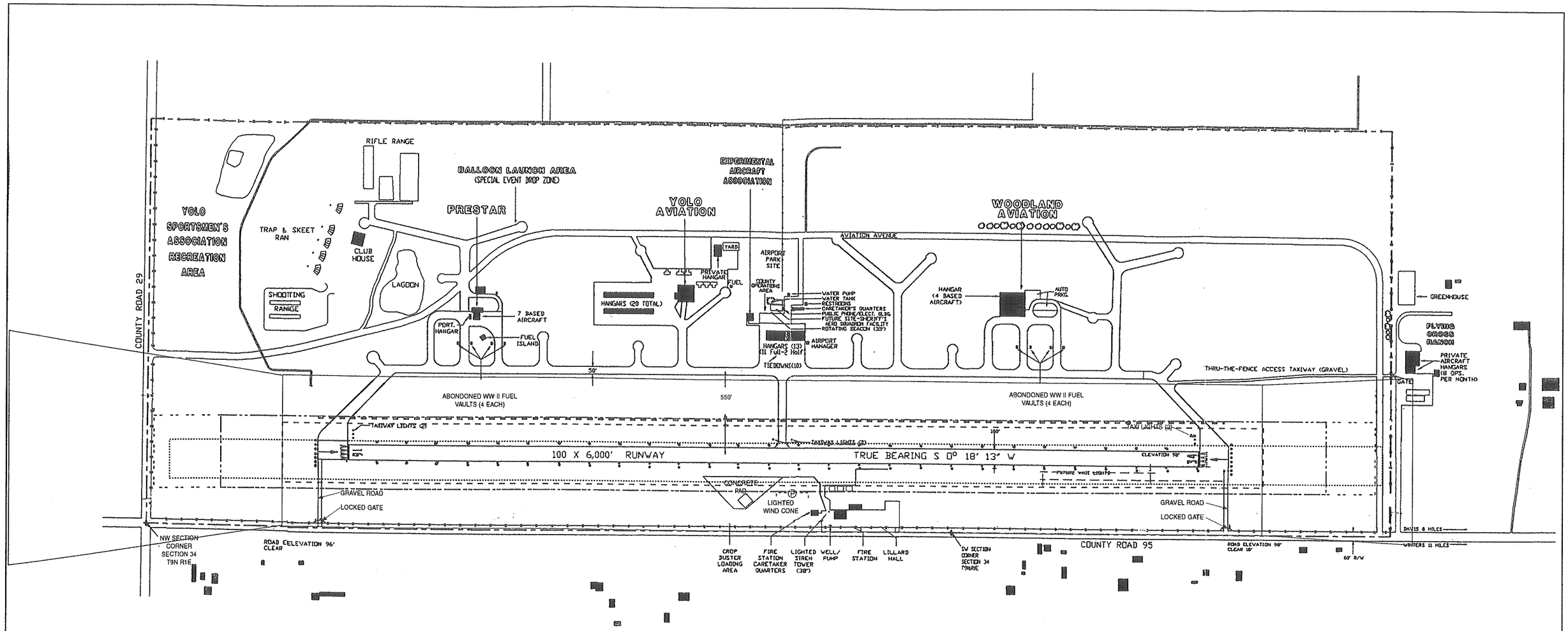
This instrument approach would further require expansion of the Runway 16 RPZ beyond that associated with Alternative C, and would require County control of additional property north of County Road 29. The 1,000-foot wide RPZ for Runway 34 would be the same length as for Alternatives A, B and C [1,000 feet], extending just south of Airport property.

As in Alternative C, the 700-foot expansion of the Runway 16 RPZ in Alternative D would extend beyond airport property necessitating that the Airport establish control within the full RPZ to prevent the creation of obstructions within the enlarged RPZ.

5. Alternative E -- C-II Visual Runway

The principal design differences between Alternatives B, C and D (B-II criteria) and corresponding Alternatives E, F and G relate to the increased approach speed of Approach

[5]. Required by FAA as a condition for receipt of future federal grants.



Obstacle Free Zone (OFZ)

Object Free Area (OFA)

Aircraft Parking Limit Line

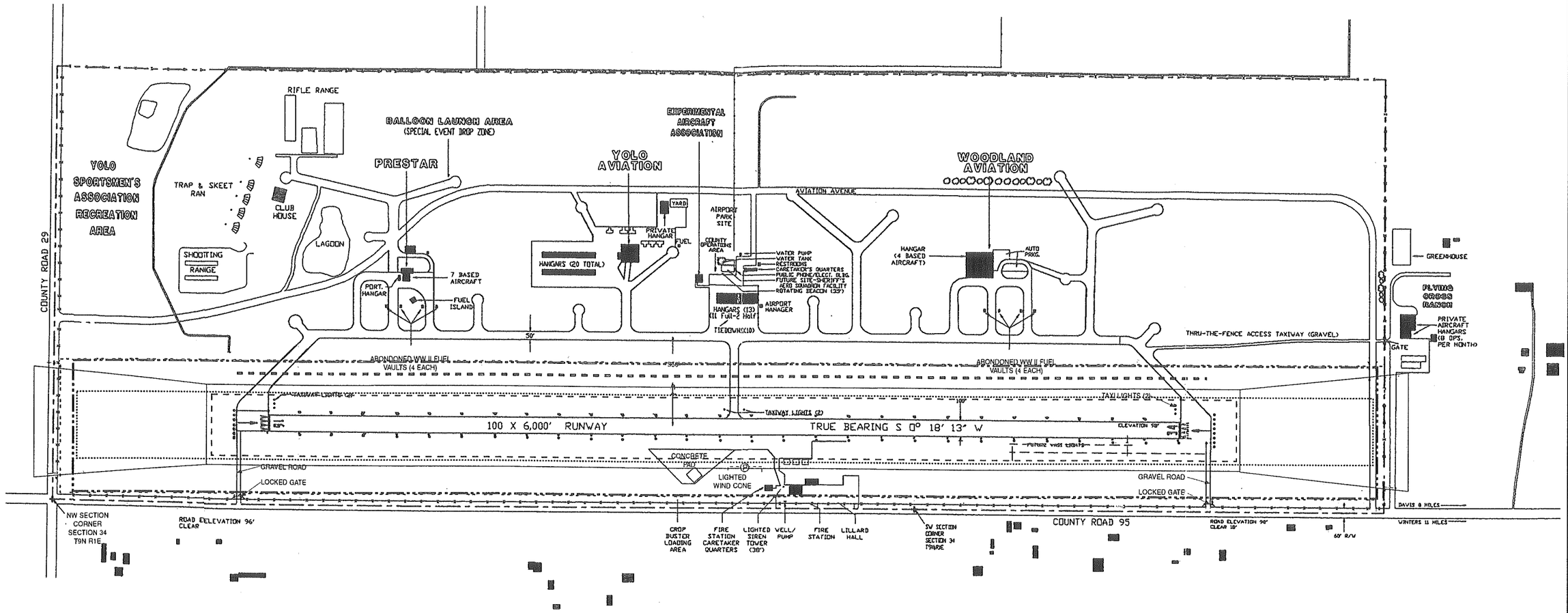
Parallel Taxiway Setback

Runway Safety Area (RSA)

Runway Protection Zone (RPZ) and FAR 77 Primary Surface

Exhibit 5-4

Study Alternative D



Study Alternative E
Aircraft Approach Category: C (121-141 knots)
Airplane Design Group: II (49'-79' wingspan)
Runway Category: Large, higher-performance aircraft
Runway Type: Visual/Visual

- Obstacle Free Zone (OFZ)
- Object Free Area (OFA)
- Aircraft Parking Limit Line
- Parallel Taxiway Setback
- Runway Safety Area (RSA)
- Runway Protection Zone (RPZ) and FAR 77 Primary Surface

Exhibit 5-5

Study Alternative E

Category C aircraft. The increased approach speed requires the application of more conservative setback criteria.

Thus, Alternative E differs from Alternative B in the provision of a more restrictive (400 feet v. 250 feet) aircraft parking limit line. In addition, the parallel taxiway separation becomes 300 feet for C-II whereas 240 feet was specified for the three B-II alternatives. The 10, 15 and 20-foot BRLs are nonexistent since they would lie inside the object free area and aircraft parking limit line. The 25-foot BRL is nearly coincident with the aircraft parking limit line. Alternative E is illustrated in Exhibit 5-5.

6. Alternative F -- C-II Runway Upgraded with a Non-precision Instrument Approach

This alternative applies the more restrictive setback criteria for approach category C aircraft to the basic scenario set forth in Alternative C.

Dimensional criteria affected by the higher Approach Category include parallel taxiway separation, aircraft parking limit, runway safety area, and object free area. Table 5-1 presents a comparison of these and all other alternatives considered. Alternative F is illustrated in Exhibit 5-6.

7. Alternative G -- C-II Runway Upgraded with a Superior Non-precision Instrument Approach

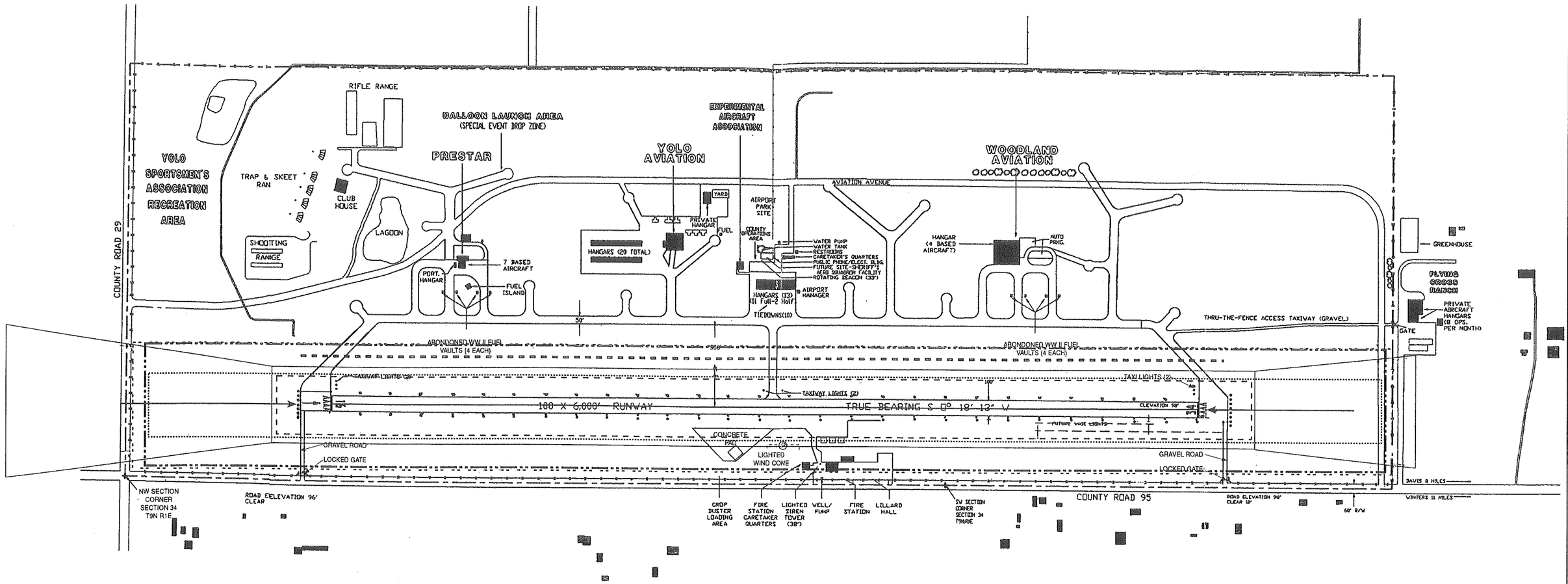
This alternative combines the more restrictive setback criteria of Approach Category C with the obstruction clearance criteria necessitated by a straight-in approach with 3/4-mile visibility. When compared with Alternative F, this alternative is more restrictive with regard to Building Restriction Line (BRL) and runway protection zone (RPZ) dimensions. Alternative G is illustrated in Exhibit 5- 7.

8. Selection of Preferred Alternative

Alternative F was selected by the ad hoc Technical Advisory Committee and subsequently endorsed by the Yolo County Board of Supervisors on September 27, 1994 as the design goal for this study. All subsequent discussions are based on the criteria applicable to Airport Reference Code C-II with non-precision, straight-in approaches to Runway 16 with visibility minima of one mile.

D. FACILITIES REQUIREMENTS

As detailed in the following discussion, certain basic airport uses will have their own sets of facility requirements defined in terms of size, access, utilities, relationship to other uses, etc. These factors must be taken into account in allocating the available space and developing an efficient building area layout. This section will describe the most important factors which affect



NORTH

0 500 1000 1500

Scale in feet

Study Alternative F
Aircraft Approach Category: C (121-141 knots)
Airplane Design Group: II (49'-79' wingspan)
Runway Category: Large, higher-performance aircraft
Runway Type: Non Precision >.75/Visual

Obstacle Free Zone (OFZ)

Object Free Area (OFA)

Aircraft Parking Limit Line

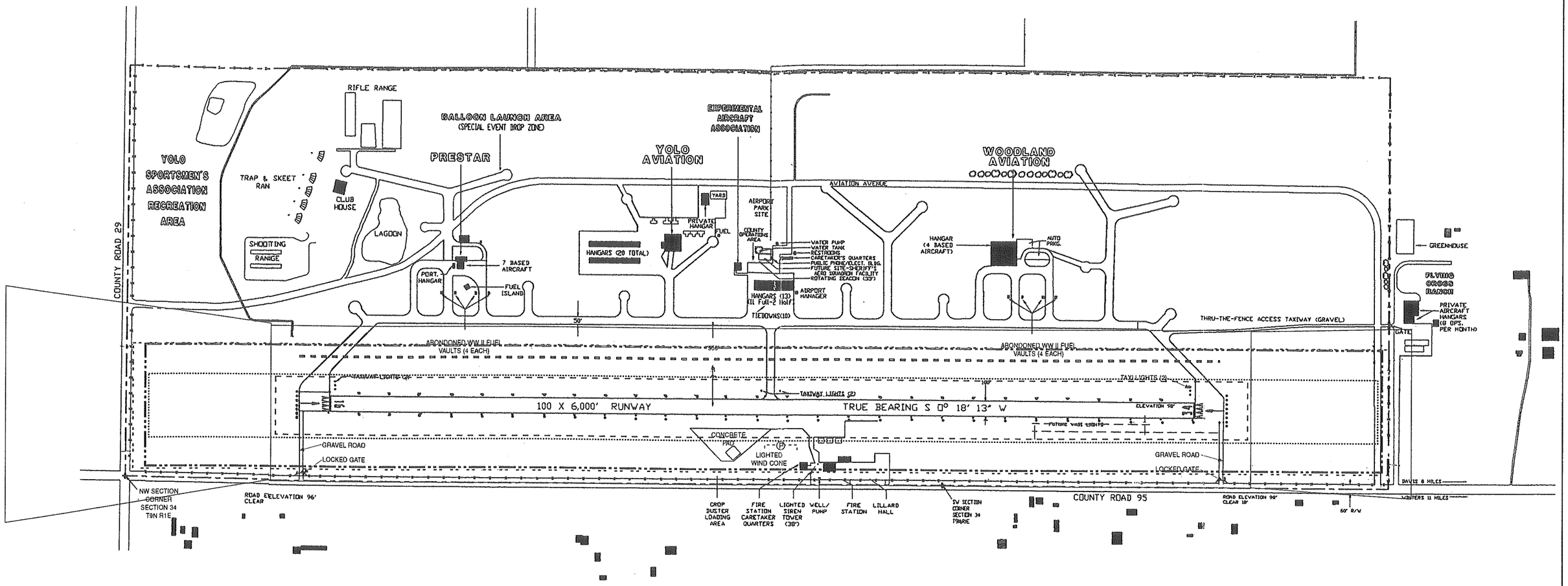
Parallel Taxiway Setback

Runway Safety Area (RSA)

Runway Protection Zone (RPZ) and FAR 77 Primary Surface

Exhibit 5-6

Study Alternative F



Study Alternative G
Aircraft Approach Category: C (121-141 knots)
Airplane Design Group: II (49'-79' wingspan)
Runway Category: Large, higher-performance aircraft
Runway Type: Non Precision =.75/Visual

- Obstacle Free Zone (OFZ)
- Object Free Area (OFA)
- Aircraft Parking Limit Line
- Parallel Taxiway Setback
- Runway Safety Area (RSA)
- Runway Protection Zone (RPZ) and FAR 77 Primary Surface

Exhibit 5-7

Study Alternative G

the pattern of development and includes recommendations for sizing and location of new facilities.

1. Potential Demand

Under "Enhanced Case"[6] demand assumptions, the Master Plan Aviation Demand Forecasts (as set forth in Section 3) suggest that based aircraft requirements will increase from a current level of 70 aircraft to 145 or more by the year 2015. Thus, up to 75 additional aircraft could be based at Yolo County Airport by the year 2015. Additional storage facilities would be required for several classes of aircraft as follow:

Single-engine Propeller	39
Multi-engine Propeller	14
Large Propeller	3
Turbopropeller	11
Turbojet	7
Rotorcraft	1
Total	75

It is important to note that these numbers are only generally representative of the actual numbers of aircraft of each class that might desire to base at the Airport over the forecast period. Various factors could affect actual demand over the planning period. More importantly, it is not possible to identify, in advance, the specific locations (whether at FBOs or on County-operated facilities) where aircraft should be based since these aspects of demand are indeterminate. Thus, facilities should be logically planned to exceed the exact based aircraft forecast. As a result, facilities for an aggregate demand for 100 or more based aircraft should be provided in order to insure the flexibility of the plan.

2. Development Constraints and Design Considerations

Options for future improvement or expansion of existing facilities can be influenced not only by the requirements specific to each use (airfield, basing facilities, access, etc.), but also by existing site constraints and design considerations (e.g., environmental constraints). Such factors as the availability of land, the locations of existing development, the Airport's operational service role, design standards, site amenities and environmental constraints must be considered in determining the overall pattern of development. These factors will also determine, to a large extent, the costs associated with development, as well as the phasing of specific projects. The extent to which each of these factors affect the development potential of the Airport is discussed below.

Land availability. Most of the land required to support current needs and future improvements are already under fee ownership. With the exception of acreage required for FAA runway protection zone (RPZ) enlargement, the 498 acre site satisfies all future needs for the airfield, other aircraft operating areas, basing facilities and non-aeronautical support uses over the

[6]. Under "Base Case" demand assumptions, facilities for 113 or more aircraft would be required.

planning period. This includes more than adequate acreage for future FBOs and other Airport businesses, land for industrial development, and aviation reserve.

The recommended improvements of the Airport's low-visibility approach capabilities as set forth under Alternative "F", necessitate enlargement of the RPZs at both ends of Runway 16-34. Specific requirements include:

Runway 16 RPZ	15.75 Ac.	Fee
Runway 34 RPZ	17.00 Ac.	Fee or Avigation Easement

Existing Leaseholds. The existing Airport leaseholds is consistent with the pattern of future development proposed for the aircraft basing/service area. Leaseholds are denoted on the Airport Layout Plan discussed in Section 6.

Existing Development. The existing land improvements within the aircraft basing/service area were constructed over a considerable time span.

Prestar Lease. Structures on the Prestar leasehold were constructed in several stages as shown in the following tabulation :

Structure	Yr. Const.	Condition
Admin./Sales	1987	Good
Port. Hangar	1992	Good
Quonset Hut	1988	Good
Fueling	1990	Good

Most of the existing structures are of a non-permanent nature, in serviceable condition and are expected to remain functional for some time. However, some buildings may be approaching the ends of their useful lives well before the 2015 horizon year and may need to be replaced during this period.

Yolo Aviation Lease. Structures on the Yolo Aviation leasehold were constructed in several stages:

Structure	Yr. Const	Condition
Lg. hangar	1974	Good
T-hangars (20)	1974	Good
Port. Hngrs (6)	N/A	Fair
Fueling	1974	Poor[7]

[7]. Scheduled for removal.

Most of the existing structures are in serviceable condition and are expected to remain functional for some time. No deficiencies were noted.

Woodland Aviation Lease. The Woodland Aviation hangar was completed in 1991, is in excellent condition, and is expected to have a \useful life extending beyond the 20-year planning period.

County Operations. Structures on the principal County operations area are in various states of serviceability.

Structure	Yr. Const.	Condition
T-Hangars (13)	1990	Good
Restrooms	1963	Good
Airport Mgr.	1992	Excellent
Caretaker qtrs.	1985	Good
Elec. vault	1963	Good

Most of the existing structures are in serviceable condition and are expected to remain functional for some time. Certain structures may be candidates for removal in connection with creation of a future County Administrative Complex and commercial center. (See below.)

Other. Facilities. Structures serving other users are in various states of serviceability.

Structure	Yr. Const.	Condition
EAA Hangar	1989	Good
Ingraham Hgr.	1989	Good

These facilities, though serviceable, may warrant reevaluation at some future time to ascertain their suitability at their present locations.

Design Standards. Various design standards must be applied in planning the aircraft basing/service area layout. The most critical are the FAA standards for runway and taxiway setback distances, runway protection zones and other related dimensions as discussed previously. (see Alternative F.) Guidelines for such features as aircraft tiedowns and T-hangar spacing must also be considered. Local building codes and standards may also have design implications.

Applicable criteria for the critical aircraft for various portions of the airfield are as follows:

- Canadair Challenger (CL601) (61.8-foot wingspan, 125 knot approach speed): runway to parallel taxiway separation, apron taxiway/taxilane separation from east side structures.

- Gulfstream-III (G-III) (68,700 lb. takeoff weight): dual-gear pavement strength.

Utilities and Infrastructure. The availability of utilities and components of the Airport's infrastructure can shape the pattern of development. The Yolo County Airport is provided with the full complement of utilities and other infrastructure including water, electrical, gas, and telephone.

All of these major utility services need to be extended, upgraded and/or expanded to handle further Airport facility improvements shown on the ALP. Facilities to channel storm runoff are also provided but may be inadequate to serve future needs as paved areas are incrementally expanded. Certain infrastructure improvements will be required to support the planned development shown on the ALP.

3. Aircraft Basing / Service Area Facilities

The aircraft basing/service area of an airport is usually considered to encompass all of the airport property available for buildings, aircraft parking, and other development which is not associated with the runways, main taxiway and required clear areas. Building area uses can include both aviation and nonaviation functions. Among those specific uses common at most general aviation airports are based and transient aircraft parking, hangars, airport businesses (FBOs), fueling facilities and the like.

Aircraft Parking. Aircraft parking considerations include:

- *Based Aircraft Tiedowns*. The general experience of airports in California indicate that there will be a greater demand for hangar spaces than tiedown spaces in the future. At present there are 15 aircraft accommodated at tiedown spaces at Yolo County Airport. Ten of these spaces are located at the County's apron at midfield and five are located on the Prestar apron.

- *Transient Aircraft Parking.* Currently, transient parking is provided at the two full-service FBOs (Prestar and Woodland Aviation). Limited transient capability is also provided at the County apron at midfield.

An estimated total of 10 transient parking spaces are currently available. Additional transient parking spaces should be incorporated in the design for the new County Administrative Complex south of the present County operations area. At least 4 spaces for each 10,000 annual transient aircraft operations should be provided.

- *Helicopter Parking*. Although used occasionally by transient helicopters, no designated operational or parking areas for helicopters have been provided at the Airport. Provisions should be made to safely and efficiently accommodate helicopters by providing a permanent, dedicated rotorcraft parking area and preferred landing area.

  The preferred helipad site would utilize a hardstand midway between the PreStar and Yolo Aviation lease areas. An alternate site would be located on the hardstand immediately south of the current, primary County operations area. Both the preferred and alternate helipad sites are illustrated on the ALP.

- *Aircraft Storage*. Hangar availability will strongly influence the realization of the based aircraft demand projections for Yolo County Airport. Over the planning horizon, demand for hangars is estimated to remain as high as the present ratio wherein 3 out of 4 based aircraft are stored in hangars. Based upon the activity forecasts, the Master Plan should provide for construction of at least 60 hangar units over the planning period. Allowances should also be made for additional hangars beyond this figure.

  Hangared storage should be expanded in association with growth in operations at the existing FBO facilities as well as at a future full-service FBO site. Further hangared storage should be provided in connection with development of a new County Administrative Complex south of the present County operations area.

Hangar Type. Various types of hangar units should be considered to meet the existing and future demand for aircraft storage at Yolo County Airport. The various types of hangars to consider include: shade shelters, portable units, T-hangars, box hangars, and hangar plots.

- *Shade Shelters*. A shade hangar is a roof-only type of hangar with no added security and limited utility. The unit cost for this type of hangar is roughly two-thirds the cost of a standard T-hangar. Shade hangars are most popular in extremely hot climates and few have been built at the Airport. While the demand for shade hangars is not considered to be significant, they can generally be accommodated on any site designated for aircraft parking or T-hangars.[8]

- *Portable Hangars*. Several portable units have been placed at the Airport and are perceived to be a relatively low-cost storage alternative with potential tax advantages for the aircraft/hangar owner. Another advantage of portable units is that they can be built one at a time and sized to accommodate a specific

[8]. Note that shade shelters are not allowed on federally-funded apron or ramp areas.

aircraft. In the long term, however, the airport revenue generated by portable hangars is typically low, especially in relation to the amount of space required. Also, the variety of hangar types, sizes, and age or condition of the units often creates an unsightly arrangement. Nonetheless, portable units provide for a demonstrated need and they can be sited and developed in a manner consistent with sound design principles.

Portable units do not require extensive roads or utilities and can be developed in a remote area of the Airport, screened from public view. The portable units should be clustered in groups and phased under a planned development agreement that provides for consistent building standards. Portable hangars and low profile industrial hangars could be readily accommodated along County Road 95 near the approach ends of Runways 16 and 34 as illustrated on the ALP.

- *T-Hangars.* T-hangars are (as the name implies) "T"-shaped units which share common walls in a nested or stacked, alternating arrangement. T-hangars are generally the most common and preferred type of aircraft storage which provide for the most efficient and cost-effective use of space, infrastructure and utilities.

  It is projected that approximately 60-75 T-hangar units will be needed over the 20-year planning period. Depending upon demand, these units could be small (40 foot to 42 foot clear opening) or larger sized hangars (42 foot to 45 foot clear opening).

- *Box Hangars.* Box hangars are more spacious than T-hangars and can provide added depth, width or height for larger aircraft. Even though they require more space per unit than the standard T-hangar, they are often an appropriate choice in site design because a taxilane is required on only one side of the building.

- *Corporate Hangar Plots.* A corporate hangar plot generally refers to any hangar built by a private party on a ground lease large enough to allow for construction of a hangar, adjoining office or lounge space, ramp area in front of the hangar, and automobile parking. Plots for corporate hangars should be planned in connection with development of a new County Administrative complex.

Other Aviation Facilities. Other aviation considerations include:

Terminal Building. A new terminal building should be planned as part of the new Administrative Complex and could be targeted for construction toward the end of the planning period as warranted by traffic demand. Services to be provided include pilot's lounge, FAA flight service

interlink, food/beverage service and Airport administration. A structure of approximately 2,500 square feet should be sufficient.

Fixed Base Operations. Although the full range of aviation services are available at Yolo County Airport, future traffic growth may justify creation of an additional FBO to supplement services presently available. Services that could be offered by a new FBO could be geared toward the growing market demand for corporate aviation users. A potential new FBO site, located between Prestar and Yolo Aviation, could accommodate a full-service FBO.

Fueling Facilities. Fueling facilities are currently provided by Prestar and Woodland Aviation. Future fueling services have been a subject of major concern to County management for several years and will result in a newly-adopted fueling services policy. In brief, the new fueling policy provides that:

- Fueling services / facilities at FBOs (requires lease and/or license).
- All fuel tanks must be above ground.
- Minimum tank size of 5,000 gal., maximum - 20,000 gal.
- Installations require an impermeable pad and containment wall.

Aircraft Rescue and Fire Fighting. The need and sophistication of airport fire and rescue facilities is basically related to the type and nature of aircraft utilizing an airport. In the case of the Yolo County Airport (FAR Part 139 certificated status), federal policy does not dictate mandatory requirements for any specific type of airport fire fighting equipment and personnel during periods of aircraft utilization. Nevertheless, it is prudent, in the interest of public safety, to ensure that measures are taken to adequately respond to any emergency with proper and effective equipment.

Fire and rescue service is currently performed by the volunteer West Plainfield Fire District from facilities located on the west side of the airfield.

Airport Traffic Control Tower. Currently, there is no provision for an Airport Traffic Control Tower (ATCT) at Yolo County Airport. The " Enhanced Forecast" of annual operations through the year 2015, is below the FAA's criterion level for establishment of a federal ATCT at an airport. Thus, it is not likely that Yolo County Airport will qualify for an ATCT within the 20-year planning period.

E. INFRASTRUCTURE REQUIREMENTS

1. Introduction

The Yolo County General Services Agency has created an active development approach for the Yolo County Airport, to attract aviation related commercial and light industrial facilities and services to locate at the Airport. The Airport presently serves a limited number of recreational and commercial aviation related businesses. To generate a more expanded commercial and light industrial development at the Airport, certain utility improvements must take place. The support facilities that would be installed consists of: drainage system improvements, extended water and new sewage services, electric and gas improvements, and telephone-communication improvements

The objective of this section of the report is to present a plan for providing all the pertinent utility services, necessary for the phased development of the airport property.

The remainder of this section is organized into six subsections, which will describe each support facility plan in detail. Each subsection is organized by discussing the existing conditions, estimating future demand, and describing the proposed utility plan for the phased Airport development.

The preferred support facility plan proposes using one trench for the installation of the utilities, when the layout of each facility will allow. Using one main trench for these improvements, will reduce the construction cost of trenching and more effectively utilize funding for the development of the support facilities. The sewage service must be in a separate trench at a distance of at least 10 feet, to conform to Public Health regulations.

The support facility plan includes mitigation measures which take into consideration the existing environmental constraints of the site to create a harmonious balance with the existing land uses in the vicinity, and the zoning policies of the County.

2. Road System Improvements

Construction of the internal road system at the Airport was completed in 1990. Approximately 5,500 linear feet of Class C County Road Standard is included in the County's road iprovement program project. Maintenance of the roadway presently consists of slurry seal, line striping, litter pick-up, culvert and ditch cleaning, and asphaltic resurfacing every 30 years. This maintenance is provided by the Yolo County Planning and Public Works Department

3. Drainage System Improvements

The airport drainage improvements originally proposed to facilitate the commercial development of lands within the Yolo County Airport were designed to do so without adversely impacting drainage and or flooding along Airport Slough.

Background. The eastern third of the Airport is prone to flooding. A flood insurance study by the U.S. Department of Housing and Urban Development has identified lands in this area as being within the 100-year floodplain.

The basic cause of their flooding is the relatively flat terrain. The present drainage from the Airport follows a very flat, man-made course which causes the water to back-up onto the low-lying areas of the Airport. The general drainage pattern in Yolo County is for the water to flow easterly to the Yolo Bypass. At the Airport, drainage has been diverted south thereby reducing the slope of its course since it now travels a greater distance for the same fall.

Basis for Design. The criteria and hydrology used in the design of the Airport Drainage Plan are summarized below:

- The level of protection specified for the parcels to be developed is that they shall not be flooded by a 100-year, 24-hour storm event.

- The parcels to be developed shall be at least one foot higher than the 100-year floodplain

Hydrology. The hydrologic analysis of the lands in the vicinity of the Airport for a 100-year, 24-hour storm event shows the following:

- The eastern portion of the Airport property is poorly drained and is subjected to frequent flooding. Floodwaters crest at about Elevation 86 and are maintained at about Elevation 84 for days at a time.

- The Airport drainage ditch along the Airport's eastern boundary is essentially flat and, therefore, the height of the water in the adjoining Airport Slough affects flooding within the Airport.

- The drainage ditch and the culvert under the Airport Road which convey drainage from the area west of the Airport to the Airport's eastern boundary are too small to convey the 100-year storm event.

- Drainage from the Airport constitutes approximately one-half the flow in Airport Slough just prior to its entering the residential development to the east.

- Existing channel storage within the Airport accounts for 20 percent of the channel storage in Airport Slough between the residential development and County Road 95.

- The Airport drainage basin has an area of approximately one square mile, which produces 180 acre-feet of runoff and a peak flow of 170 cft for a 100-year, 24-hour duration storm event (although all of this runoff does not enter Airport Slough at the southeast of the airport).

Recommended Plan. The drainage plan proposed to facilitate the development of lands within the Airport, is comprised of the following:

a. Expand the Airport drainage facilities to accommodate drainage from the basin west of the Airport.

b. Isolate the Airport from Airport Slough backwater (100-year flood).

c. Provide phased on-site detention storage to reduce the peak flows. (This storage can be phased to accommodate incremental airport development.)

Summary of Findings. Based upon the drainage study in and around the Airport, the following findings are summarized :

a. A drainage plan can be implemented in phases to accommodate the phased commercial development of lands within the Airport without adversely impacting drainage and/or flooding along Airport Slough.

b. The proposed drainage plan is compatible with water delivery operations for the Yolo County Flood Control and Water Conservation District.

4. Water System Improvements

Under the water system improvement program for the Airport, there are presently three wells on Airport property. The well used by the County to serve the existing commercial businesses, has an 8-inch casing with a 5 horsepower submersible pump. Storage is provided by two 1,000 gallon hydropnuematic tanks and one 166,000 gallon tank. The well has a current production capacity of 75 gallons per minute (gpm) against a discharge pressure of 50 pounds per square inch (psi).

The second well on the property is located on the Yolo Sportsman's Association lease that supplies water for domestic use, irrigation, and maintaining the water level in the Association's lake. The well is serviced by a 5-horsepower pump.

The third well is used by the West Plainfield Fire Department and has a capacity of 500-600 gallons per minute. This well is also utilized by the crop dusters for mixing their chemicals.

The existing water distribution system described herein, was reviewed by the engineering firm of Walker and Associates. The water supply system for the proposed Airport development must

meet the requirements of the California Health and Safety Code and California Administrative Code Title 22. As such, the required capacity and storage volume for 47 connections is 225 gallons per minute and 166,000 gallons , respectively. The needed source capacity and storage volume though may be modified upon approval of the State Department of Health Services and/or local health officials.

Regarding fire flow requirements, the County presently has an ordinance that requires automatic fire sprinkler systems for buildings over 4,000 square feet. In addition, discussions with the West Plainfield Fire Protection District, East Yolo Fire Protection District, and Davis Fire Department, indicate that fire flow delivery to the fire hydrants should equal 1,000 gpm each for two hydrants (or a total flow of 2,000 gpm) for a two hour duration.

The estimated domestic water demand is based on the following assumptions:

a. 47 parcels with 47 persons/parcel
b. 65 gallons per person day
c. 3.6 peaking factor

The estimated maximum daily water demand, using these estimates, is 105 gpm. The fire flow demand as discussed previously for 47 parcels is 2,000 gpm for 2 hours.

It is proposed that a single looped closed water distribution system serving both domestic and fire flow needs should be installed. The system would run from the present well site, in a loop; described as being the length of the area fronting on the taxiway providing service to Lease Areas A and B to the west; and running along the sides of the outer parcels to the north and south, to the eastern side of the access road on the opposite side of the development providing service to parcels in Lease Areas C and D. The water line would be installed adjacent to taxiway and road in a trench which would be used for the other utilities of electrical, gas and telephone services. To accommodate the fire flow demand, the existing well would have to be upgraded and a larger pump installed, to provide approximately 500 gallons per minute. In addition, at the existing well, a 1,500-gpm centrifugal booster pump station must be installed for maintaining the daily operations of the domestic water supply.

In order to alleviate the concern for well failure, a new proposed well would be developed on the northern end of the Airport site, west of the access road, with a capacity of approximately 500 gallons per minute.

Concerning the single water distribution system, the service would be installed by using 10 and 12-inch diameter PVC piping. This would include trenching, backfill, and compaction for the water distribution system in the cost estimate.

Along the water line, it is proposed that fire hydrants would be installed every 600 feet along with isolation valves. To complete the water system, blow-off assemblies and gate valves would also be included in the utility plan.

8. Sewage System Improvements

The soil characteristics of the Yolo County Airport site form development restrictions; subsequently, design standards must be adequate to address the use of septic tanks - leach field systems for the disposal of sewage.

For the most part, a shallow leachbed is currently used in the Airport building areas. Presently there are limited sewage services which extend to the public restrooms, the caretaker's trailer and the office and lounge of the Fixed Base Operator.

As a part of this section of the plan, a soil survey was conducted to determine the limitations of the subsurface disposal of sewage. Three test pits were dug with a backhoe to a depth of approximately 8 feet. The results of the survey illustrated a very tight clay lense below 4 feet that restricts water percolation. Groundwater was encountered at 8 feet. Onsite disposal of wastewater therefore would require shallow beds or elevated disposal fields. Sewage flows are estimated to equal 90 percent of the estimated water demand. This flow equals 35,200 gallons per day.

The recommended central collection system was also reviewed by the engineering firm of Walker and Associates. The preferred design, which the County proposes to install, is a central collection system that would collect septic tank effluent from each of the 47 parcels. The sewage service has a similar configuration to the water distribution system. The distinct difference are: first the sewage system is a segmented circular pattern and; secondly, the water and sewage lines require a 10 foot minimum separation by the California Health and Safety code. For this reason the water and sewage line will be placed on opposite sides of the parcel line when applicable.

The leaseholder of each parcel will be responsible for installing a properly sized septic tank on the individual parcel. The waste water would flow by gravity to one or two package pump stations, where it would be pumped to 36 elevated leach beds, consisting of 3 sets of 3 mounds for each Lease Area. The waste water from Lease Areas A and C would flow to the pump station and to the elevated leach beds located in the northwestern area of the site adjacent to the runway. Lease Areas B and D would be connected to the pump station and mounded leach beds to the southwest opposite the leach beds of Lease Areas A and C. Thirty-six elevated mounds are required for the two systems because of the size limitation of a bed to operate correctly and to distribute the flow evenly.

Regarding the sewage distribution system layout, 6 inch piping will be installed, along with the required number of manholes and cleanouts to complete the system.

For sewage system improvements Lease Areas A and B (Phase 1 and 2) would constitute a more extensive improvement, which entails one element - the wet well and dosing pump. This feature is needed in Phases 1 and 2 for the waste water to flow by gravity to the package pump stations, where it would be pumped to the 3 sets of 3 mounds or 9 elevated beds. As the development is leased out and Lease Area C (Phase 3) is available, the package pump station would be able to accommodate the septic tank effluent. Lease Area C, as with Lease Area D (Phase 4), would

require only the collection system, needed road crossings, and 9 elevated leach beds each, since the wet well and dosing pump would already be in place.

6, Pacific Gas and Electric Improvements

Presently at the Airport, the primary provider of utilities is the Pacific Gas and Electric Company. Overhead electric lines currently offer services to the Yolo Sportsmen's Association, the Fixed Base Operators, and the Airport caretaker. The electrical lines servicing these facilities are connected at the midpoint of the development from the rear of the Rolling Acres Subdivision. To date, natural gas does not exist at the site, but a 4" main is available from County Road 29, which is the main access route to the Airport development.

As part of the overall utility installation, the proposed design, which this plan proposes to install, follows the preliminary layout plan which was generated by the Pacific Gas and Electric Company, for the Yolo County Airport.

For the electrical layout, it is proposed that the point of entrance to the Airport development would initiate at the existing riser pole between Parcels 38 and 39, located at the eastern boundary of Lease Areas C and D. The electrical conduits will be installed in the same trench as the water distribution line when the utility layouts are in the same configuration. The 4 and 6 inch electrical conduits would run north to south in a semi-circle configuration. The layout is described as commencing on the west side of the access road from the midpoint of parcel 3 extending to the southwestern corner of parcel 8, in Lease Area A. Proceeding to the eastern side of the road to arrive at Parcel 34, in Lease Area C, this section of the electrical installation will provide service to Phases 1 and 3. From this point the electrical lines will run the length of the second Phase of the access road to the south, which will provide serves to Lease Areas B and D; then turning to the west along the third Phase of the access road and terminating at the southeastern corner of Parcel 32, providing electrical service to Phases 2 and 4 of the development. To augment the system ,six arterial 4 inch conduits will run under the road to service Parcels in Lease Areas A and B.

In regards to the utility service installation, the County will be responsible for providing the needed materials: 4 and 6 inch conduit, 25 pull boxes and labor consisting of trenching and installation. The Pacific Gas and Electric Company will provide the construction plans, a road inspector; and the footage and quantify needed for the materials consisting of electrical wire and switch boxes. This concludes the segment of the electrical service installation.

The preliminary design for gas service was developed by the Pacific Gas and Electric Company. The gas line will be established in the main utility trench with the water and electrical lines. The gas and water lines require a 12 inch minimum separation. The gas service will initiate from the established main line on County Road 29. The proposed 3-inch line will run from north to south along the eastern side of the Airport Road, in a semi-circle configuration. The 3-inch gas line will begin at the entrance to the development following Phase 1 of the access road, providing service to Lease Areas A and C. Continuing to the south through Phase 2 of the access road and then

turning west to terminate at the southeastern corner of Parcel 32 in Phase 3 of the access road. Thus providing service to Lease Areas B and D.

To complete the gas service system five 2-inch gas lines will cross under the road to the west penetrating Lease Areas A and B to provide additional gas services to these parcels.

7. Telephone Improvements

To conclude the support facilities, the last utility that will be discussed is the telephone improvements.

Similar to the electrical facilities, Pacific Bell provides telephone communication services, which also originate from the rear of the Rolling Acres subdivision. The telephone line is also above ground, coming into the Airport at the midpoint of the eastern boundary of the building area. Telephone services are available to the Fixed Base Operators and the Airport caretaker.

The recommended layout that this plan proposes follows the preliminary design which was developed by Pacific Bell, for the communication service at the Airport. The telephone layout, is very similar to the electrical plan and was created to follow and conform to the same configuration of the electrical and gas services. Doing so, enables these utilities to be installed in one main trench, along with the water distribution system.

As with the electrical improvements, it is proposed that the telephone service point of entry to the development will be initiated between Parcels 38 and 39. The telephone line will extend to the west stopping, adjacent to the Airport road. The 4-inch telephone conduit would also run north to south in a semi-circle pattern, enabling service boxes to be secured. The service would originate at the midpoint of Parcel 3 extending to the southeastern corner of Parcel 8, then crossing to the eastern side of the road to Parcel 34. This will provide hook-up to Lease Areas A and B resulting in additional telephone service to these parcels.

F. INFRASTRUCTURE PHASING

The recommended infrastructure development has been proposed as a phased plan to provide a long-range utilization of the facility. The support facilities consist of: road improvements, drainage proposals, a water distribution system, sewage system improvements, electrical and gas improvements and telephone services. The recommended plans are designed to present the reader with a suggested development plan.

In order to more effectively utilize funding for the development of the support facilities at the Airport, the Master Plan proposes: first, to install the water, electrical, gas and telephone lines in one main trench; and secondly, to phase the installation of the utility services by establishing a policy requiring the leasing of areas in phases. Through this process the development will have controlled growth, all necessary support facilities, and subsequent utilization of the proposed

services. Lease Area A development would precede Lease Area B. Once Lease Area A is completely occupied and recommended improvements have been installed, Lease Area B would be developed utilizing the same process for Lease Areas C and D. Since Lease Areas C and D are on the eastern side of the Airport road, they do not allow as much airside access, therefore, these parcels may be considered for some non-aviation related uses. The proposed development phasing and the associated estimated capital costs are more fully described in Section 7.

SECTION 6
AIRPORT PLANS

SECTION 6.
AIRPORT PLANS

In addition to this report, the Master Plan is also documented graphically on a set of airport plans. The key plan is the Airport Layout Plan (ALP) which is an overall layout of existing and proposed new airport facilities. The second plan is the Terminal Area and Access Plan, which is a layout of the airport's building area and access road(s) drawn to a larger scale than was possible on the ALP. The last drawing in the set is the Airport Airspace Plan that is used to illustrate height limitations of objects on lands near the airport. At large commercial airports, several other drawings are generally included to document, in greater detail, other features of the airport.

A. DRAWING GUIDELINES

Guidelines for the preparation of airport plans is contained in FAA Advisory Circular 150/5070 - 6A , Airport Master Plans. The Advisory Circular stipulates the contents of each airport drawing in terms of : facilities both on and off the airport that are to be included; data to be shown; scale of the plan; and, preferred size of the drawing.

Set out below is a list of objectives that the airport drawings are intended to achieve:

- Provides Overview of the Project Facilities
- Shows Spatial Relationships of the Facilities
- Forms the Basis of Final Design
- Provides a Bridge Between Planning and Design
- Defines the Scope and Magnitude of the Proposed Facility Requirements
- Provides Guidance to Local Officials of the Need for Airport Zoning
- Illustrates Noise Impacts Within the 65 Ldn Contour on the Adjacent Communities
- Provides Height Limitations on Adjacent Land Uses for Airport Zoning
- Allocates Airport Land Area for Aviation and Non - Aviation Uses
- Shows the Relationship Between Proposed New Facilities and Existing Facilities.
- Documents Airport Property Boundaries
- Illustrates Airport Security Measures Provided for the Airside Elements
- Shows Areas Reserved for Future Airport Facilities
- Identifies Visual Aids and NAVAIDS to be Provided in the Future

A brief description of each of the airport plans is set down in the following subsections.

B. DESCRIPTION OF AIRPORT DRAWINGS

Set out in the following subsections are brief descriptions of the required airport drawings

1. Airport Layout Plan (ALP)

The ALP is the most important drawing in the set because it includes the entire project scope on a single drawing. In the eyes of the FAA, the ALP is a legal document that contains the airport sponsor's intent to proceed with certain airport improvements shown on the plan. Specific project information must be included on the plan because it is used for reference by various operating departments of the FAA, such as NAVAID locations, horizontal and vertical control information for preparation of instrument approach charts and by the FBOs when it is proposed to introduce a new aircraft model at the airport. In order for a proposed project to be eligible for federal aid, it must be shown on an approved Airport Layout Plan.

Because so much information must be included on the drawing, the scale is small, and therefore the data shown on the ALP must be supplemented by companion drawings prepared at a larger scale. These companion drawings are described in later sub-sections of this document.

The format of the ALP is consistent regardless of the size of the airport. In addition to the delineation of the project, the drawing contains runway and airport data tables that present important information that can not be shown on the drawing. The drawing also must contain a wind rose , preferably for both all-weather and instrument flight rules, weather, a vicinity map and a location map. Elevations and coordinates of runway ends, airport reference point and other control facilities must be identified. Lastly a legend of symbols used, identification of buildings, a magnetic and true north arrow with the annual declination and, a graphic scale represents the minimum information to be included on the plan

.

As mentioned previously, a description of the companion drawings of the ALP are set out in the following sub-sections.

2. Terminal Area and Access Plan

This plan is drawn at a larger scale than the ALP so that the layout of the buildings, roads and parking facilities can be illustrated with more detail. The plan also shows the interface of the terminal facilities with the airside configuration. It should be noted that all of the planning drawings are schematic in detail and are subject to refinements following completion of the final design of airport facilities. The drawing shows the spatial relationship of the buildings as well as areas reserved for facilities to be provided in the future .It also shows available lease plots for aviation and non-aviation activities.

3. Airport Airspace Plan (Formerly the Approach and Clear Zone Plan)

This FAA required document provides obstacle data in the runway approaches and an area surrounding the airport to protect circling approaches to the runway. The plan consists of a plan and profile of the 6000 ' runway and the extended runway centerline to the end of the conical surface. The drawing contains the imaginary surfaces defined in Federal Aviation Regulation, Part 77. These include the primary; transitional; approach; horizontal; and, conical surfaces. A brief description of these surfaces is set out in the tabulation below:

Primary Surface. A rectangular area at ground level and centered in the runway and extending 200 ' beyond the runway ends. The width of the Primary Surface varies according to the type of operations conducted on the runway. The width of the Primary surface for Alternative F is 500'.

Transitional Surface. A sloping surface starting at the edge of the Primary Surface and extending at right angles to the runway centerline at a slope of one foot vertical to seven feet horizontal. The elevation of the Transitional Surface at the Primary Surface is the same as the elevation of the nearest point on the runway.. The Transitional Surface extends up to the Horizontal Surface

.

Approach Surface. A trapezoidal shape starting at the end of the Primary Surface, 200' from the end of runway and extending up at various slopes depending on the type of operations conducted on the runway. The proposed non-precision instrument approach on Runway 16, requires an approach surface slope of one foot vertical to 34 feet horizontal. Runway 34 will retain a visual approach category that requires an approach surface slope of one-foot vertical to 20 feet horizontal. The Approach Surfaces extend a horizontal distance of 10,000' for the 34:1 slope, and 5,000' for the 20:1 slope. The outer widths of the Approach Surfaces are 3,500' for the 34:1 slope and 1,500' for the 20:1 slope.

Horizontal Surface. A horizontal plane 150' above the elevation of the airport (98' MSL) The Horizontal Surface is elliptical in shape with a radius of 10,000' centered on the runway centerline at the runway ends. The radius is connected by tangents to form the ellipse.

Conical Surface. An elliptical surface with a slope of 20:1 starting at to edge of the Horizontal Surface and extending a horizontal distance of 4,000'.

Other data shown on the drawing includes the vertical and horizontal graphic scales and a location map. The magnetic declination as of December 1994, is 15^{0} - 44 ' E with an annual rate of change of 3.0 per year.

C. AIRPORT LAYOUT PLAN FORMULATION

This subsection describes the translation of the Facility Requirements as set out in Section 5, to the Airport Layout Plan delineation.

1. Runway Design

The FAA stipulates that any new construction on a runway requires that the runway be upgraded to meet current design standards. Since the adoption of the 1976/77 Master Plan, the FAA has adopted new airfield guidelines governing, among others, the Runway Safety Area (RSA), the Runway Object Free Area (ROFA), and the Runway Protection Zone (RPZ). In situations where the RSA, ROFA, and RPZ do not meet current design standards because of the lack of sufficient land or because of other physical constraints, the airport is considered to be constrained. In these instances, the " declared distance " concept is used to designate the available landing and takeoff lengths at the airport's runway. The "declared distance" concept is actually not new because the

International Civil Aviation Organization (ICAO) has applied the concept to airports throughout the world, including international airports in the U.S., for many years.

At Yolo County Airport, no physical features limit the full utilization of the runway due to the requirements for meeting RSA, ROFA, and RPZ standards. Although at the north end of the airport property, County Road 29 bisects the RPZ of Runway 16, the RSA and ROFA lie entirely within airport property, and therefore the airfield is considered to be unconstrained.

Runway Length. Existing Runway 16-34 is currently marked to have an effective length of 6,000 feet. Under this configuration, the runway can accommodate 95% or more of the small aircraft fleet (under 12,500 pounds) under maximum design conditions. Dependent on the ambient temperature, the runway can accommodate 60% or more of the turbine-powered corporate aircraft fleet.

The design goal of the ultimate airfield configuration as suggested by Alternative F (see Section 5) is fully satisfied by the existing runway at its present 6,000-foot length. Therefore, a runway extension program is not necessary to achieve the plan objectives.

Runway Object Free Area (ROFA). The ROFA consists of a rectangular area centered on the runway centerline that shall be kept free of objects except those fixed by function such as NAVAIDS. The required ROFA of the existing B-II runway is 500 feet wide and extending 600 feet beyond each end of the runway. Both of the landing thresholds meet the requirements of being 600 feet from the property fences. For the ultimate C-II runway (see Section 5, Alternative F), the required ROFA is 800 feet wide centered on the runway and extending 1,000 feet beyond the runway ends.

Runway Safety Areas. The RSA comprises a rectangular area centered on the runway which is graded to allow safety for aircraft which undershoot, overrun, or veer off the runway and for firefighting and rescue equipment. The RSA is to be kept free of objects including parked aircraft except those objects fixed by function and mounted on frangible supports.

The required RSA dimensions for the existing B-II runway is a minimum of 150 feet wide centered on the runway and extending 300 feet beyond each runway end. For the C-II runway as described in Alternative F, the required RSA is 400 feet wide centered on the runway and extending 1,000 feet beyond the runway ends.

Runway Protection Zones (RPZ). For each category of runway, the FAA has defined an RPZ, which is a trapezoidal area at ground level that normally begins 200 feet from the threshold and is centered on the extended runway centerline. At a constrained airport, the location of the RPZ' s may be governed by object clearing requirements. At Yolo County Airport, the RPZ's for the existing B-II runway extends beyond the property fences. Therefore full control by the County of these RPZ's is not currently achieved. The FAA recommends that the land within the RPZ be under the control of the airport sponsor. The two principal purposes are to protect runway approaches by minimizing development and to enhance safety by limiting concentrations of population in these areas. Note that only the outer 100-200 feet of the current visual RPZ's

extend beyond the airport property. This condition can be mitigated by the acquisition of additional land either in fee title or through avigation easements.

The RPZ's for the existing airfield configuration are under the control of County with the exception of a portion that overlies the Flying Cross Ranch to the south. An easement or purchase in fee simple should be obtained for this parcel. Under Alternative F, it is proposed to acquire sufficient property north of County Road 29 so that the County will control the land in fee simple for the RPZ in the approach to Runway 16. The acquisition in fee simple of the lands designated on the ALP will also permit possible future installation of the MALSF approach lighting system.

2. Runway Setback Requirements

This subsection describes airfield geometric standards required to satisfy the design standards of the airport classification. Set out in the following subsections are descriptions of the pertinent standards to be met.

Runway - to Taxiway Separation. The standard for separation distance between the runway centerline and parallel taxiway centerline for non-precision and visual runways are :

Airplane Design Group	Weight	Separation Distance
I	12,500 or less	150'
I	12,500 +	225'
II	12,500 +	240'

Currently the runway is used by aircraft 12,500 pounds or less in weight. These are primarily single-engine aircraft with wing spans less than 49 feet (Design Group I). The existing 500 foot separation between the runway and parallel taxiway exceeds the Design Group I standard. The HS-125-800 and Beech King Air B200 represent the largest size aircraft which utilize the airport to a significant degree. Although these aircraft have wingspans that place them in Design Group II, the required runway-to-taxiway separation is only 152.2 feet.

Upgrading the existing airfield to be in full compliance with Airport Reference Code C-II criteria will be satisfied by the existing parallel taxiway. To facilitate use of the existing parallel taxiway as an apron edge taxiway (taxilane) as shown on the ALP, it is proposed that a new parallel taxiway be constructed to replace the existing parallel taxiway. The existing taxiway can then be used to facilitate aircraft flows in and around expanded east side apron areas.

Building Restriction Line. The current FAA design standards do not specifically cover the previous Building Restriction Line (BRL) criteria. Instead, setback requirements are expressed in other standards dealing with FAR Part 77 surfaces, RPZs, ROFAs, line of sight, and NAVAID critical areas to define suitable airport building locations. Other considerations include providing sufficient taxiway/taxilane safety area widths. The FAR Part 77 surfaces running parallel to the

runway form the primary consideration in establishing suitable airport building locations. These surfaces start 250 feet on each side of the runway centerline, and slope upward at a grade of 1 foot vertical to each 7 feet horizontal measured perpendicular to the runway centerline. At 400 feet from the runway centerline, the allowable building height is 21 feet above the height of the corresponding runway elevation.

Runway Hold Line. Runway hold lines are located to prevent penetrations of the obstacle free zone and runway safety area by aircraft holding prior to entering the runway. The hold lines for the existing and ultimate runway are to be located 200 and 250 feet from the runway centerlines, respectively.

Blast Pads. A full width 150 foot long runway blast pad is planned for the each end of the runway.

3. Taxiways

For most aircraft in Design Group II, a taxiway width of 35 feet is satisfactory. For some aircraft having an undercarriage width greater than 15 feet such as the Falcon 900, the 35-foot width does not provide the full taxiway edge safety margin of 10 feet. Pilots of these aircraft need to exercise extra caution in using the airfield. The existing taxiways are 35 feet wide which satisfies most aircraft presently using the airport. The future relocation of the existing parallel taxiway and provision of two new exit taxiways should also comply with the 35-foot width.

There are three exit taxiways, none of which have adequate fillets. Two additional exits roughly bisecting the northern and southern halves of the runway will be required as traffic activity increases over time.

4. Airfield Marking

Runway. Guidance for the marking of airfield pavements is given in FAA Advisory Circular 150 / 5340-1F *Marking of Paved Areas on Airports*. Runway and taxiway markings are essential for the safe and efficient use of airports, and their effectiveness is dependent upon proper maintenance to maintain an acceptable level of conspicuity.

The following marking criteria is required for the current runway:

- Centerline Marking (12" x 120' stripes, spaced 80' apart)
- Designation Marking (runway end numerals)
- Holding Position Markings

The existing runway markings meet the specifications of the Advisory Circular for a visual runway. However, it should be emphasized that frequent maintenance is essential to assure that pavement markings (especially runway markings) are clearly visible. Therefore, it is

recommended that the County continue a vigilant program of airfield inspection to assure the efficacy of pavement markings.

The marking standard for the ultimate runway would consist of the following:

- Centerline Marking (1.5' x 120', spaced 80' apart)
- Designation Marking (runway end numerals)
- Threshold Marking (8 ea. 6' x 150' stripes spaced 1.5' apart)
- Fixed Distance Markings (to inform a pilot of remaining available pavement) (15' x 50' bars, spaced 36' apart)
- Holding Position Markings

When low visibility instrument approaches become available, it will become necessary to re-mark the affected pavement including runway ends. Normally, runway marking would follow pavement resurfacing in the overall construction sequence. However, instrument marking may be delayed if installation of electronic navigational aids lag behind pavement resurfacing.

Taxiways. Three categories of taxiways (existing and proposed) are applicable to the airport - the parallel taxiway; exit taxiways; and, apron edge taxiway/taxilane. The marking of taxiways involve three basic elements, as follows :

- Taxiway Centerline Marking (6" continuous yellow stripe)
- Taxiway Edge Marking (double 6" yellow stripe, spaced 6" apart)
- Holding Position Markings (at runway intersections)

The existing taxiway markings meet the specifications stipulated in the referenced Advisory Circular. As with the comment on runway markings, frequent maintenance is essential to assuring taxiway visibility.

Future taxiways will be required to serve C-II category aircraft. These improvements would include :

- Construction of new parallel Taxiway 1,300 feet from the centerline of Runway 16-34. The existing taxiway would revert to an apron edge taxilane, and would need appropriate marking.
- Construction / Reconstruction of Connecting Taxiways

These taxiways (and their associated shoulders) should be marked in accordance with the referenced Advisory Circular.

Ramp Areas. To avoid confusion and congestion as aircraft traffic increases, the terminal aprons should be marked with aircraft taxi guidance stripes as believed necessary to prevent damage to pavement shoulders and aircraft.

5. Airfield Lighting

Guidance for airfield lighting is contained in FAA Advisory Circulars 150 / 5340-13A, 15A, and 18. These Advisory Circulars refer to runway, taxiway, and taxiway guidance signs respectively. Lighting is necessary so that the airport may be used for night operations. The lighting system should include, as a minimum, runway edge lights, a rotating beacon, a lighted wind indicator, and taxiway exit lights or signs.

A medium intensity runway lighting system (MIRL) is satisfactory for non-precision instrument operations with visibility minimums of one mile or greater. To complement the MIRL system, it is recommended that medium intensity taxiway lights (MITL) be provided. In addition, upgrading of runway lights to high intensity (HIRL) may be required together with a MALSF approach light system if minimums of 3/4 mile are to be achieved in the future.

Currently, Runway 16-34 is equipped with MIRL as recommended by FAA. Taxiways have reflectorized markers only. To facilitate nighttime operations in the future, all taxiways used for access to terminal areas should be equipped with MITL. Taxiway guidance signs should be considered to facilitate ground movements as nighttime operations of transient aircraft increase. The existing rotating beacon meets FAA criteria, as does the lighted wind tetrahedron. [2]

MIRL and MITL should be provided for all future runway and taxiway improvements respectively associated with category B-II or C-II operations. Floodlighting of all ramp areas (and ramp expansions) should be provided.

6. Navigational Aid Requirements

Although the Airport can continue to function with limited instrument capability, it is essential that all-weather capability be provided for the ultimate airport configuration. The ability of a corporate pilot to locate the airport and successfully land the aircraft is greatly enhanced by the provision of electronic navigational aids (NAVAIDS) which provide guidance to the runway during periods of poor visibility. Furthermore, effective runway visual aids are available to assist a pilot in identifying the runway end and landing the aircraft during periods of good visibility.

The airport is not currently equipped with electronic NAVAIDS, therefore, the airport is available principally during visual meteorological conditions. Major in-place visual aids are limited. The ability of the Airport to attract greater numbers of corporate and other sophisticated users will require installation of additional approach aids.

In response to anticipated demand, the proposed installation of a non-precision approach capability is recommended. Unlike existing technology requiring costly and high maintenance on site equipment, the utilization of emerging GPS technology would require no new on-site electronic navigational aids.

D. AIRPORT LAYOUT PLAN

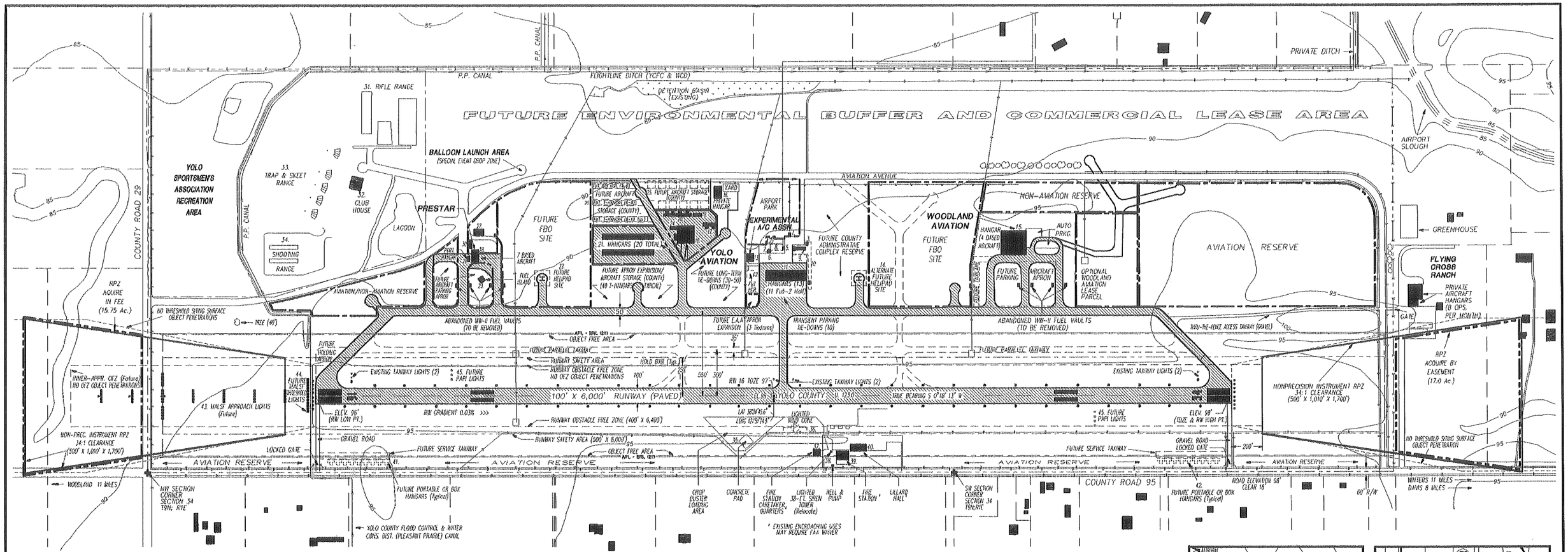
The proposed updated Airport Layout Plan (ALP) is presented as Exhibit 6-1. The ALP incorporates all of the design considerations and facilities requirements discussed in Section 5.

E. TERMINAL AREA AND ACCESS PLAN

Exhibit 6-2 is a delineation of the airport building area drawn to a larger scale than the ALP so that the buildings, roads, parking, and lease plots shown on the ALP can be more fully seen.

F. AIRPORT AIRSPACE PLAN

Exhibit 6-3 is an illustration of the Airport Airspace Plan showing the FAR Part 77 imaginary surfaces that define height limitations of man-made and natural objects on lands surrounding the Airport, The plan is overlaid on a regional map so that specific geographical locations can be identified.



RUNWAY DATA

DESCRIPTION			EXISTING 1997	PROPOSED 1998-2002	PROPOSED 2003-2015
EFFECTIVE RUNWAY GRADIENT			0.03 %	SAME	SAME
% OF WIND COVERAGE @ 13 KTS.			97.4 %	"	"
RUNWAY PHYSICAL LENGTH x WIDTH			6000' x 100'	"	"
RW/TW PAVEMENT STRENGTH			30,000 lb. S.W.L./ 45,000 lb. D.W.L.	"	"
APPROACH SLOPES		RWY 16	34:1	"	"
		RWY 34	34:1	"	"
RUNWAY TYPE, MARKING & FAR 77 CAT.		RWY 16	VISUAL	N.P. INSTR	N.P. INSTR
		RWY 34	VISUAL	N.P. INSTR	N.P. INSTR
NAVIGATIONAL AIDS			NONE	MALSF/ PAPI	MALSF/ PAPI
RUNWAY/TAXIWAY LIGHTING			MIRL/NONE	MIRL/MITL	MIRL/MITL
RUNWAY SAFETY AREA	LENGTH BEYOND RUNWAY		500'	SAME	SAME
	WIDTH		1000'	"	"
RUNWAY	INNER WIDTH	RWY 16	500'	"	"
		RWY 34	500'	"	"
PROTECTION	OUTER WIDTH	RWY 16	1,010'	"	"
		RWY 34	1,010'	"	"
ZONES	LENGTH	RWY 16	1,700'	"	"
		RWY 34	1,700'	"	"
RUNWAY END COORDINATES (NAD 83)	RWY 16	LAT.	LAT 38°35'15.2"	"	"
		LONG	LONG 121°51'24.6"	"	"
	RWY 34	LAT.	LAT 38°34'15.9"	"	"
		LONG	LONG 121°51'25.3"	"	"

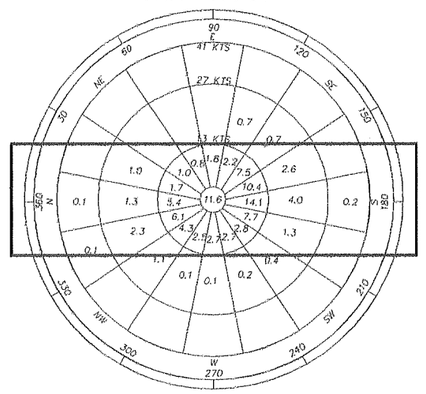
LEGEND

DESCRIPTION	EXISTING 1997	PROPOSED 1998-2002	PROPOSED 2003-2015
AIRPORT PROPERTY/EASEMENT LINE			
BUILDINGS			
RUNWAY - TAXIWAY - APRON			
AIRPORT REFERENCE POINT		SAME	SAME
BOUNDARY FENCE	x x	"	"
AIRPORT BEACON (ALNACO-HB2/1000A)		"	"
PAPI OR VASI	NONE	"	"
PROPERTY DIVISION OR LEASE LINE			
TREES		SAME	SAME
AIRCRAFT PARKING LINE			
BUILDING RESTRICTION LINE-21' BLDG.			
ELECTRIC POWER SERVICE		SAME	SAME
IRRIGATION CANAL/DITCH		"	"
SURFACE DRAINAGE DITCH		"	"
WATER MAIN		"	"
RUNWAY LIGHTS		"	"
APPROACH LIGHTS	NONE		
THRESHOLD LIGHTING			

FACILITIES LIST

DESCRIPTION	EXISTING 1997	PROPOSED 1998-2002	PROPOSED 2003-2015
1. WATER PUMP	X	SAME	SAME
2. WATER TANK	X	SAME	SAME
3. RESTROOMS	X	SAME	SAME
4. CARETAKER FACILITIES	X	SAME	SAME
5. ELECTRICAL BUILDING	X	SAME	SAME
6. ROTATING BEACON (35')	X	SAME	SAME
7. COUNTY OPERATIONS YARD	X	SAME	SAME
8. FUT. SHERIFF'S AERO FACILITY ON CONCRETE PAD		X	SAME
9. FUTURE TERMINAL BUILDING		X	SAME
10. FUT. TERM. PARKING AND SUPPORT FACILITY		X	SAME
11. HANGARS (13)	X	SAME	SAME
12. FUTURE HANGAR		X	SAME
13. EAA HANGAR	X	SAME	SAME
14. ALT. FUTURE HELIPAD		X	SAME
15. PRIVATE HANGAR (WOODLAND AV.)	X	SAME	SAME
16. PRIVATE HANGAR	X	SAME	SAME
17. T-HANGARS (2)	X	SAME	SAME
18. PRIVATE HANGAR (YOLO AV.)	X	SAME	SAME
19. CARETAKER'S RESIDENCE (TEMP.)	X	SAME	SAME
20. T-HANGARS (4)	X	SAME	SAME
21. HANGARS (20)	X	SAME	SAME
22. FUTURE HELIPAD		X	SAME
23. FUEL ISLAND	X	SAME	SAME
24. CARETAKER'S RESIDENCE (TEMP.)	X	SAME	SAME
25. FUTURE AIRCRAFT STORAGE		X	SAME
26. FUTURE AIRCRAFT STORAGE		X	SAME
27. OFFICE	X	SAME	SAME
28. QUONSET	X	SAME	SAME
29. PORTABLE HANGAR	X	SAME	SAME
30. OFFICE	X	SAME	SAME
31. RIFLE RANGE	X	SAME	SAME
32. CLUB HOUSE (YOLO SPORTSMAN)	X	SAME	SAME
33. TRAP AND SKEET RANGE	X	SAME	SAME
34. SHOOTING RANGE	X	SAME	SAME
35. CROP DUSTER LOADING AREA	X	SAME	SAME
36. LIGHTED WIND CONE	X	SAME	SAME
37. CARETAKER'S QUARTERS (WPFPD)	X	SAME	SAME
38. LIGHTED 38-FT. SIREN TOWER	X	SAME	SAME
39. FIRE STATION	X	SAME	SAME
40. LILLARD HALL	X	SAME	SAME
41. FUTURE HANGARS (9)		X	SAME
42. FUTURE HANGARS (9)		X	SAME
43. FUTURE MALSF APPROACH LIGHTS		X	SAME
44. FUTURE MALSF THRESHOLD LIGHTS		X	SAME
45. FUTURE PAPI LIGHTS		X	SAME

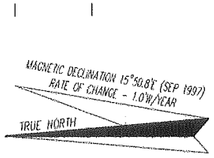
WIND ROSE

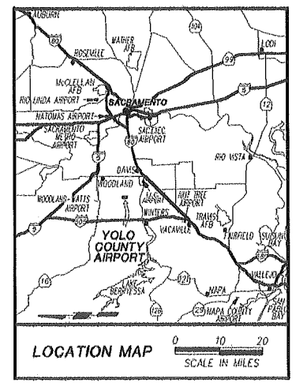


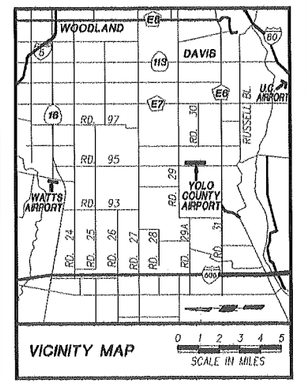
WIND DATA: U.S. DEPT. OF COMMERCE WEATHER BUREAU 1951 - 1960
WIND COVERAGE: 11.6% CALMS (0-2.6 KNOTS) 97.4% WIND COVERAGE @ 13 KTS
SOURCE: AIR TRAFFIC CONTROL TOWER, SACRAMENTO METRO AIRPORT
PERIOD: JANUARY 1968 TO DECEMBER 1972

AIRPORT DATA

		EXISTING 1997	PROPOSED 1998-2002	PROPOSED 2003-2015
AIRPORT CLASSIFICATION		BASIC UTILITY B-II	C-II	C-II
AIRPORT ELEVATION		98' MSL	SAME	SAME
AIRPORT REFERENCE POINT NAD 83		LAT 38°34'45.6" LONG 121°51'24.9"	"	"
MEAN MAX TEMPERATURE: HOTTEST MONTH		97° F	"	"
INSTRUMENT APPROACH	RWY 16	GPS/VOR 1 mile vis.	"	"
	RWY 34	GPS/VOR 1 mile vis.	"	"
BASED AIRCRAFT		70	92	145
DESIGN AIRCRAFT		BAe 125-800	CL601	CL601







FAA DISCLAIMER

The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of this plan by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted therein nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public laws.

SUBMITTED BY:
COUNTY OF YOLO
GENERAL SERVICES AGENCY
625 COURT STREET
WOODLAND, CALIFORNIA 95695

By _____ Date _____
Chair, Board of Supervisors

By _____ Date _____
Director, General Services Agency

NO.	DATE	REVISION	BY	APP.

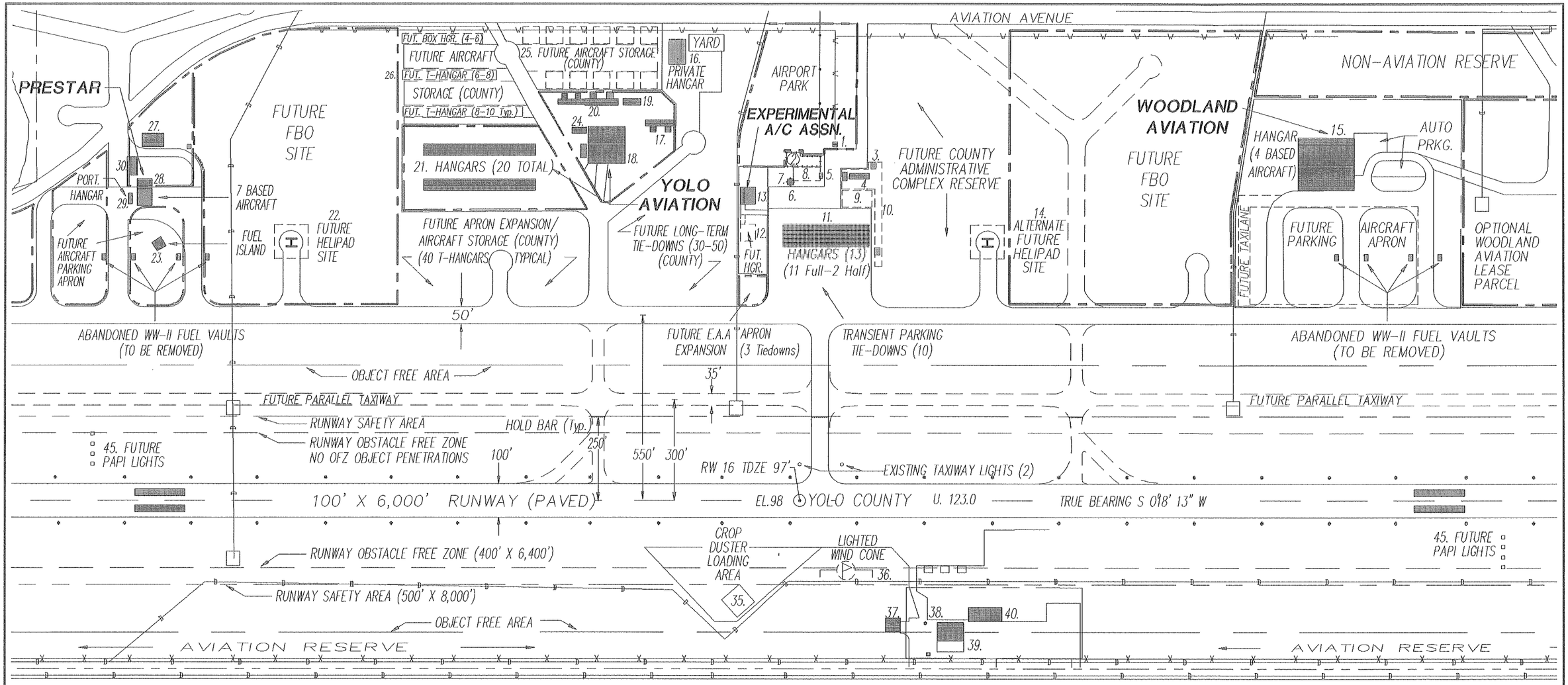
YOLO COUNTY AIRPORT
WOODLAND, CALIFORNIA

AIRPORT LAYOUT PLAN

P&D AVIATION
A DIVISION OF P&D CONSULTANTS
1999 Broadway, Suite 300
Oakland, Ca 94607
(510) 839-7337

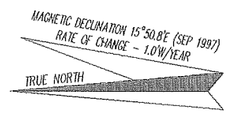
DESIGNED: TGM | CHECKED: MRM
DRAWN: TGM, DL | DATE: APRIL 11, 19

Exhibit 6-1



FACILITIES LIST

DESCRIPTION	EXISTING 1997	PROPOSED 1998–2002	PROPOSED 2003–2018	DESCRIPTION	EXISTING 1997	PROPOSED 1998–2002	PROPOSED 2003–2018
1. WATER PUMP	X	SAME	SAME	20. T-HANGARS (4)	X	SAME	SAME
2. WATER TANK	X	SAME	SAME	21. HANGARS (20)	X	SAME	SAME
3. RESTROOMS	X	SAME	SAME	22. FUTURE HELIPAD		X	SAME
4. CARETAKER FACILITIES	X	SAME	SAME	23. FUEL ISLAND	X	SAME	SAME
5. ELECTRICAL BUILDING	X	SAME	SAME	24. CARETAKER'S RESIDENCE (TEMP.)	X	SAME	SAME
6. ROTATING BEACON (35')	X	SAME	SAME	25. FUTURE AIRCRAFT STORAGE		X	SAME
7. COUNTY OPERATIONS YARD	X	SAME	SAME	26. FUTURE AIRCRAFT STORAGE		X	SAME
8. FUT. SHERIFF'S AERO FACILITY ON CONCRETE PAD		X	SAME	27. OFFICE	X	SAME	SAME
9. FUTURE TERMINAL BUILDING		X	SAME	28. QUONSET	X	SAME	SAME
10. FUT. TERM. PARKING AND SUPPORT FACILITY		X	SAME	29. PORTABLE HANGAR	X	SAME	SAME
11. HANGARS (13)	X	SAME	SAME	30. OFFICE	X	SAME	SAME
12. FUTURE HANGAR		X	SAME	35. CROP DUSTER LOADING AREA	X	SAME	SAME
13. EAA HANGAR	X	SAME	SAME	36. LIGHTED WIND CONE	X	SAME	SAME
14. ALT. FUTURE HELIPAD		X	SAME	37. CARETAKER'S QUARTERS (WPFPD)	X	SAME	SAME
15. PRIVATE HANGAR (WOODLAND AV.)	X	SAME	SAME	38. LIGHTED 38-FT. SIREN TOWER	X	SAME	SAME
16. PRIVATE HANGAR	X	SAME	SAME	39. FIRE STATION	X	SAME	SAME
17. T-HANGARS (2)	X	SAME	SAME	40. LILLARD HALL	X	SAME	SAME
18. PRIVATE HANGAR (YOLO AV.)	X	SAME	SAME	45. FUTURE PAPI LIGHTS		X	SAME
19. CARETAKER'S RESIDENCE (TEMP.)	X	SAME	SAME				



SCALE IN FEET

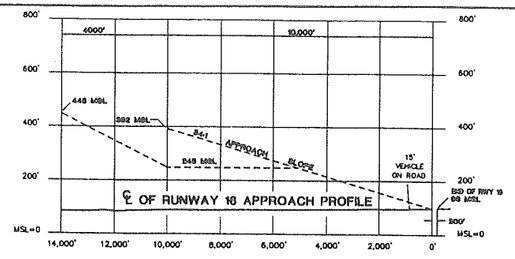
0 300 600

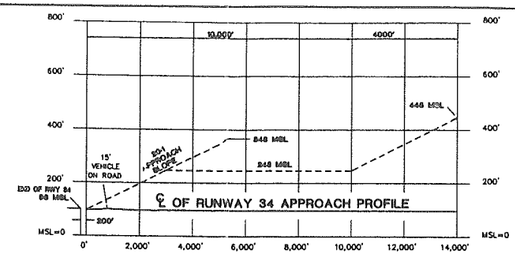
YOLO COUNTY AIRPORT
WOODLAND, CALIFORNIA

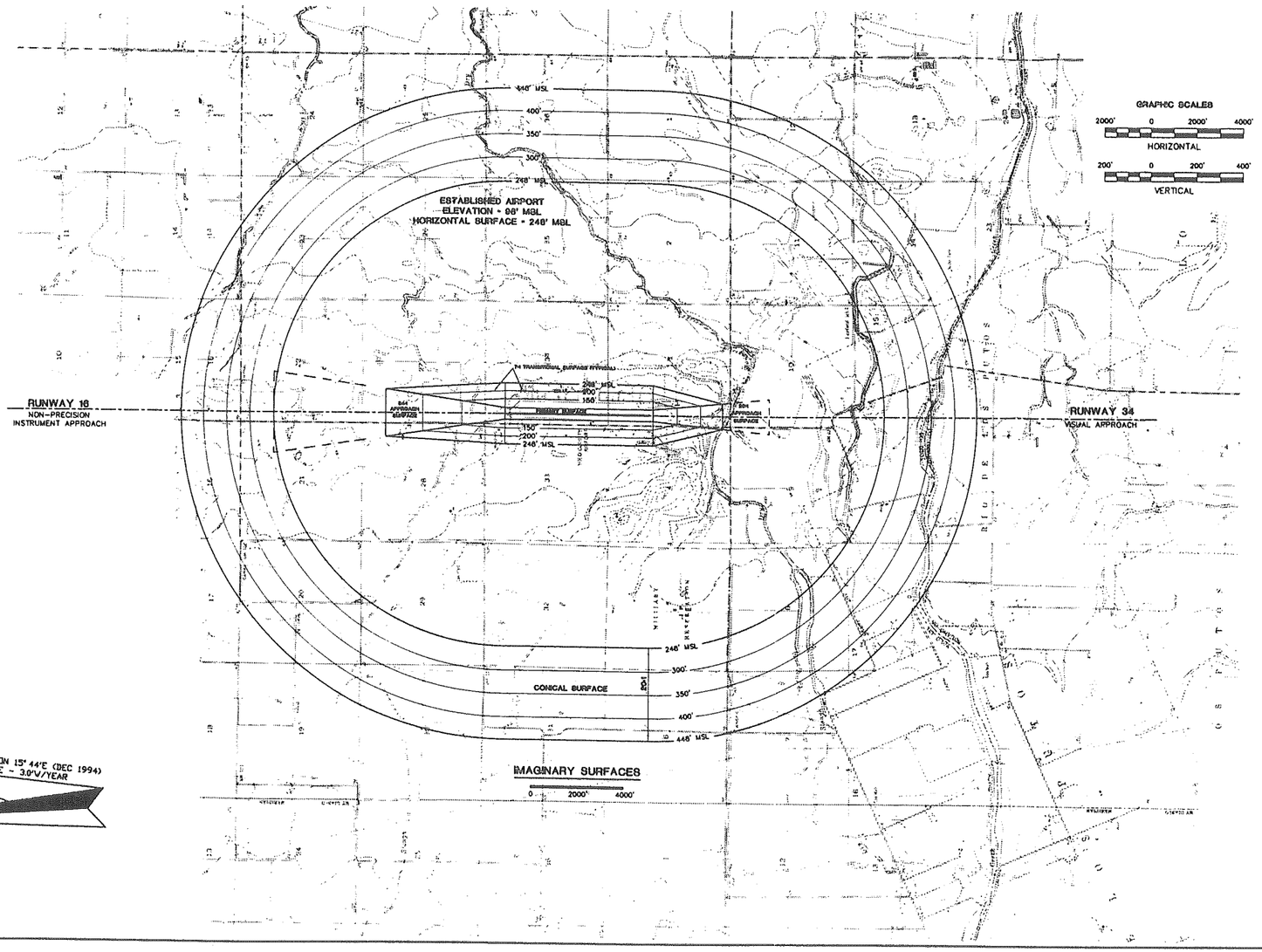
TERMINAL AREA PLAN

P&D AVIATION
A DIVISION OF P&D CONSULTANTS
1000 Broadway, Suite 380
Oakland, Ca 94607
(510) 839-7337

DESIGNED: TGM	CHECKED: MRM	FIGURE 6-2
DRAWN: TGM, DL	DATE: APRIL 11, 1998	







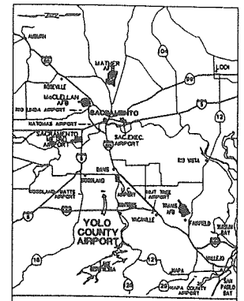


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Exhibit 6-3

Airport Airspace Plan

SECTION 7
CAPITAL COSTS AND PHASING

SECTION 7.
DEVELOPMENT COST AND STAGING

This section of the report presents the capital requirements for implementing the proposed development program in its three phases over the 20-year planning period. It should be emphasized, that although the capital costs shown are for specific airport facilities, there should be no commitment to make the investments unless an actual need for such facilities can be demonstrated. The indicated facilities are based on the forecast of future demand.

Should actual demand not attain the forecast, then the indicated facilities should be deferred until such time as the actual demand matches forecast values. On the other hand, if actual demand exceeds the forecast values, then the implementation schedule of facilities must be advanced accordingly. The main benefit of presenting this capital cost and staging program is to provide guidance to the County for anticipating when investment is needed according to the actual demand levels.

A. CAPITAL IMPROVEMENT PROGRAM

1. Program Elements

The staged development program is summarized in Table 7-1. The program is presented in three phases as required by the FAA airport master plan advisory circular, which are identified as the short, intermediate, and, long term programs

Highlighting the program is the staged enlargement of the Airport's aircraft basing and service area to accommodate the forecast increase of based aircraft and operations. The staged program also provides for the possible addition of two FBOs at designated sites on the east side of the property.

The program further provides for land and easement acquisitions for runway protection zones and for possible future approach lighting associated with anticipated instrument approach capability.

New aircraft parking aprons, apron expansion and provision of a new, full-length parallel taxiway with connecting taxiways round-out the major program elements.

The estimated costs associated with these program elements are set out in the following sub-sections:

2. Cost Estimates

Cost estimates based on 1995 dollar values for the staged proposed improvement program are summarized in Table 7-1. It should be noted that the proposed development elements may or

Table 7-1
Summary of Costs
Capital Improvement Program
Yolo County Airport

	Capital Projects	1995 $ Total Cost	Inflated $ [a] Total Cost	% Funded w/ Federal/State Grants [b]	Cost Federal State Grant Share	Cost Local Share
STAGE I PROJECTS (1998-2002)						
A1	RWY 34 RPZ Easement	9,574	9,804	90%	8,824	980
A2	PAPI/VASI Installation	66,304	71,193	90%	64,074	7,119
A3	County Apron Expansion	595,328	639,318	90%	575,387	63,932
A4	T-Hangar Development	819,200	890,165	0%	-	890,165
A5	Rehabilitate Hardstand Taxilane	91,904	96,368	90%	86,731	9,637
A6	Hangar Development	(c)	(c)		(c)	(c)
A7	County Apron Expansion	382,336	391,512	90%	352,361	39,151
A8	Equip. Storage Area Fencing & Improvements	9,690	9,690	90%	8,721	969
A9	Helipad Site Development	50,220	51,425	90%	46,283	5,143
A10	Runway 16 RPZ Acquired in Fee	70,963	74,410	90%	66,969	7,441
A11	Future FBO Site Infrastructure (d,e)	117,760	127,961	90%	115,165	12,796
A12	Prestar Aviation Apron Expansion (e)	407,296	442,579	90%	398,321	44,258
A13	E.A.A. Apron Development	14,145	15,188	90%	13,669	1,519
A14	Woodland Aviation Apron Expansion (e)	416,256	447,014	90%	402,313	44,701
	SUBTOTAL -- STAGE 1 PROJECTS	3,050,976	3,266,629		2,138,818	1,127,811
STAGE II PROJECTS (2003-2007)						
B1	Terminal Building Development	485,600	608,358	0%	-	608,358
B2	Upgrade Perimeter Fencing	264,960	298,318	90%	268,487	29,832
B3	Instrument Runway Marking/HIRL Upgrade	161,280	190,406	90%	171,365	19,041
B4	County Apron Expansiuon	293,760	330,744	90%	297,670	33,074
B5	T-Hangar Development	614,400	725,491	0%	-	725,491
B6	Future FBO Sitre Infrastructure (N. Woodland Avn)	59,520	73,682	90%	66,314	7,368
B7	Slurry Seal Existing County Apron	11,904	13,403	90%	12,062	1,340
B8	Leasehold Site Infrastructure (N. of Prestar)	82,560	92,954	90%	83,659	9,295
B9	Leasehold Site Infrastructure (E Woodland Avn)	44,160	49,720	90%	44,748	4,972
B10	West Side Hangar Site Preparation/Development	189,798	218,823	90%	196,940	21,882
	SUBTOTAL -- STAGE II PROJECTS	2,207,942	2,601,900		1,141,245	1,460,654
STAGE III PROJECTS (2008-2015)						
C1	Infrastructure for Long-term Avn Dev (S. Woodland)	197,376	268,729	90%	241,856	26,873
C2	Resurface Runway	428,288	648,658	90%	583,792	64,866
C3	Resurface Apron Taxiway	149,057	236,718	90%	213,046	23,672
C4	Construction	792,448	1,166,832	90%	1,050,149	116,683
C5	MALS Approach Lighting	128,000	144,115	100%	144,115	-
	SUBTOTAL -- STAGE III PROJECTS	1,695,169	2,465,052		2,232,958	232,094
TOTAL MASTER PLAN PROJECTS		6,954,087	8,333,580		5,513,021	2,820,559

[a] Inflated $ costs are estimated costs at year of expected development, escalated at 2.4% per year, compounded.

[b] Federal and State grants are estimated at 90% of eligible project costs.

[c] Funded by private sources.

[d] Utilities only.

[e] Airport outlays recoverable through rent/lease structure.

may not occur in the indicated timeframes. As the need occurs, a suitable project response can be exercised. Further, if appropriate responses are not formalized in the overall plan, it is not likely to receive favorable funding decisions at the State or Federal levels. The program does not reflect any commitment or obligation to undertake any or all of the projects, nor is the program set out in Table 7-1 a firm order of preference or priority.

Over the long term planning period, some $6,954,087 could be invested. This sum is projected to meet local aeronautical needs through the short-term (through 2002), intermediate-term (2003 - 2007) and long-term (2008-2015) periods.

Table 7-1 also presents the investment expressed in inflated dollars. The inflated costs are estimates of the costs incurred during the timeframe when the development is to be implemented. The escalation rate used is 2.4% per year, compounded.

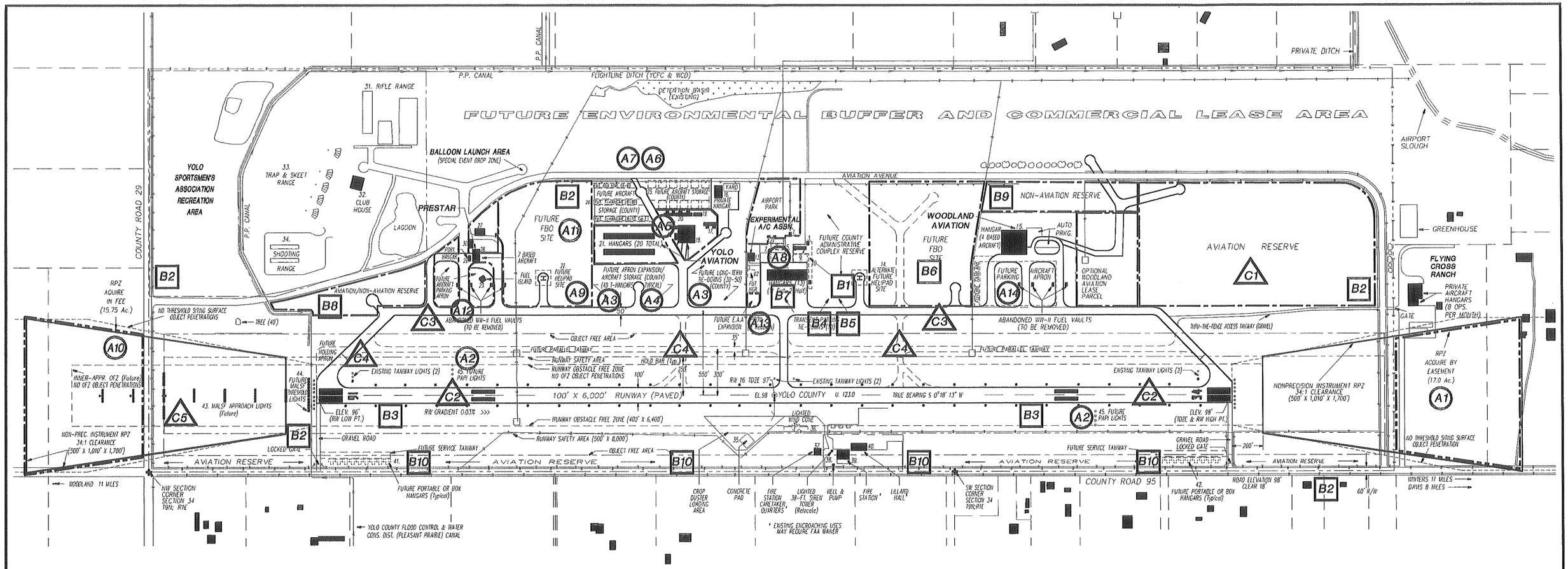
Presented below is a more detailed discussion of the capital cost requirements for each of the staging periods.

Short-Term Program. Over the period through 2002, a combined County, Federal and State or private investment shares of the capital costs are estimated to total $3, 050,976 in 1995 dollars or $3, 266,629 inflated dollars. This comparison of 1995 vs inflated dollars emphasizes the investment impact occasioned by inflation. The County or private investment share of the short-term program is estimated to be $1,127,811 in inflated dollars, since the short-term period extends through 2002. The largest portion of County or private investment funds would be used for the construction of aircraft hangars.

Intermediate-Term Program. During the next five year development program, the expectation is to invest additional funds of $2,335,943 in 1995 dollars or $3,266,629 inflated dollars. The County or private investment share of this investment is estimated to be $1,460,654 inflated dollars. The major County or private investment funds during this stage would be expended on additional aircraft hangars and a new terminal building.

Long-Term Program. The last phase of the development program for facilities needed through 2015, will require further investment of $1,567,169 in 1995, dollars or $2,320,937 inflated dollars. This long-term capital cost shows the adverse impact caused by inflationary effects on the amount of investment required in the future versus constructing the facilities in the short-term.

The County or private investment share of the long-term program is on the order of $232,094, the major development item being the construction of a parallel and connecting taxiways.



Stage I (1998-2002) (A4)
(60,000 operations, 92 based aircraft)

A1	RWY 34 RPZ acquisition by easement
A2	PAPI/VASI installation
A3	County apron expansion (former Yolo Av.)
A4	T-hangar development
A5	Rehabilitate hardstand taxilane
A6	Hangar development
A7	County apron expansion (east of Yolo Av.)
A8	Equip. storage area fencing & related improvements
A9	Helipad site development
A10	RWY 16 RPZ acquisition in fee
A11	Future FBO site infrastructure
A12	Prestar Aviation apron expansion
A13	E.A.A. apron development
A14	Woodland Aviation apron expansion

Stage II (2003-2007) (B1)
(79,000 operations, 106 based aircraft)

B1	Terminal building development
B2	Upgrade perimeter fencing
B3	Instrument runway marking/HIRL upgrade
B4	County apron expansion
B5	Hangar development
B6	Future FBO site infrastructure (N of Woodland Av.)
B7	Slurry seal existing county apron
B8	Leasehold site infrastructure (N of Prestar)
B9	Leasehold site infrastructure (E of Woodland Av.)
B10	West side hangar site preparation/development

Stage III (2008-2015) (C1)
(101,000 operations, 145 based aircraft)

C1	Infrastructure for long term aviation development south of Woodland Aviation
C2	Resurface runway
C3	Resurface apron taxiway
C4	Parallel/connecting twy & holding apron const.
C5	MALSF approach lighting

NO.	DATE	REVISION	BY	APP.

YOLO COUNTY AIRPORT
WOODLAND, CALIFORNIA

PROPOSED DEVELOPMENT PROGRAM

P&D AVIATION
A DIVISION OF P&D CONSULTANTS
1000 Broadway, Suite 300
Oakland, Ca 94607
(510) 839-7337

DESIGNED: TGM | CHECKED: MRM
DRAWN: TGM, DL | DATE: APRIL 11, 1998

Exhibit 7-1

SECTION 8
FINANCIAL PLAN

SECTION 8
FINANCIAL PLAN

This chapter of the Yolo County Airport Master Plan reviews the financial resources available to the County for funding airport capital improvements, develops a 10-year annual pro-forma financial projection to determine capital funding requirements, and identifies a minimum capital improvement program that makes maximum use of available funding resources.

In developing the above information, certain additional background analyses were undertaken including: analysis of airport operating revenues and expenses; evaluation of existing leases vis-à-vis industry guidelines and FAA requirements; and, a survey of competing airports to determine the comparability of Yolo County airport lease rates, hangar rents and other factors. A recommended airport property management/action plan was also prepared. Together, all of these analyses provide the background for the Financial Plan.

A. CAPITAL FUNDING SOURCES

There are two grants-in-aid programs designed specifically for airport development: the FAA's Airport Improvement Program (AIP); and, the State's California Aid to Airports Program (CAAP). Other funding sources are private capital, airport lease revenues, and County funds (Airport Enterprise, primarily, and, when so warranted, the County General Fund).

1. FAA Airport Improvement Program (AIP)

On the Federal level, the FAA's Airport Improvement Program provides funding for planning, construction, or rehabilitation at any public airport. The current grant program, known as the AIP, was established by the Airport and Airway Improvement Act of 1982, as amended. The AIP provides funding from the Airport and Airway Trust Fund for airport development, airport planning, noise compatibility planning and to carrying out noise compatibility programs.

The Trust Fund has traditionally provided the revenues used to fund AIP projects. The Trust Fund concept guarantees a stable funding source whereby users pay for the services they receive. Taxes or user fees are collected from the various segments of the aviation community and placed in the Trust Fund. These taxes include an 8 percent tax on airline tickets, a 5 percent tax on freight waybills, a $3 international departure fee, a $.12 and $.14 per gallon tax on general aviation gasoline and jet fuel, respectively, and a $.05 and $.10 per pound tax on tires and tubes, respectively.

Under the Act, the authorization for funds not obligated in a fiscal year carries forward to future fiscal years unless the Congress takes specific action to limit such amounts. During the annual appropriations process, Congress may also limit the funding for grants to an amount that differs from the above authorization. It should be noted that in fiscal year 1995 the actual amount appropriated was $1.418 billion (versus the authorized amount of $2.161 billion) -- 66 percent of the authorized amount was appropriated. Similar results have occurred in subsequent years.

Projects eligible for AIP funding consist of: capital outlays for land acquisition; site preparation; construction, alteration, and repair of runways, taxiways, aircraft parking aprons, and roads within airport boundaries (except for access to areas providing revenue, such as parking lots and aviation industrial areas); construction and installation of lighting, utilities, navigational aids, and aviation-related weather reporting equipment and safety equipment required for certification of an airport facility; security equipment required of the sponsor by the Secretary of Transportation; limited terminal development at commercial service airports; and, equipment to measure runway surface tension. Grants may not be made for the construction of hangars, automobile parking facilities, buildings not related to the safety of persons in the airport, landscaping or art work, or routine maintenance and repair. Technical advisory services are also eligible.

The Airport Improvement Program provides a maximum Federal share of 90 percent for all eligible projects at Yolo County Airport. Because of the large number of projects competing for AIP funds, not all eligible projects can be funded.

In fiscal year 1995, $14,707,540 in AIP funds was granted to 22 "general aviation" airport projects in the State of California (excluding reliever airports) for an average grant of $668,500 per project. General aviation airports may be publicly or privately-owned to receive AIP grants, but must be included in the National Plan of Integrated Airport Systems (NPIAS). There are presently 122 general aviation (non-reliever) airports in the State that are contained in the current NPIAS and which compete for the AIP funds. Proposed grant projects must compete with all other projects in the State on the basis of need.

The funds for AIP are distributed in accordance with provisions contained in the 1982 Act.

2. California Aid to Airports Program (CAAP)

The CAAP provides three types of grant funding: annual grants, acquisition and development grants (A&D), and a portion of the non-Federal portion of FAA AIP grants (AIP Match). In addition to grants-in-aid, the CAAP provides financial assistance in the form of low interest loans, repayable over a period not to exceed 25 years. Two types of loans are available: Revenue Generating Loans and Matching Funds loans. The interest rate for these loans is based on the most recent issue of State of California bonds sold prior to approval of the loan.

Each program is discussed below.

Annual Grants. The annual grants are used to fund pre-approved, eligible projects and/or operations and maintenance of public-use general aviation airports (commercial service and reliever airports are not eligible). The funds are a fixed amount of $10,000 annually and may be accrued for a maximum of five years with no matching requirements. Grants can be used for airport and aviation services such as marking systems, fencing, lighting, navigation aids, land acquisition, parking and tie downs, noise monitoring, and obstruction/hazard removal. Funds can also be used for servicing of general obligation or revenue bonds issued to finance airport capital

improvements and for operation and maintenance purposes. They may also be used as the local match for a Federal grant.

Acquisition and Development Grants. Acquisition and development grants provide discretionary funds for airport projects included in the adopted State Transportation Improvement Program (STIP). The STIP is a five-year capital improvement program for which any publicly-owned, public-use airport may apply. Under the "true" five-year STIP, the funding period is the first year, and the remaining four years are "committed to" to the extent that funds are available. In prioritizing project submittals, the Department of Aeronautics uses the "STIP Project Evaluation Matrix" and an Airport Rating form.

Acquisition and development grants can be used to fund any capital improvements on an airport and for aviation purposes with runway maintenance projects receiving the highest priority for funding. Additionally, funds can be used for servicing general obligation or revenue bonds issued to finance airport capital improvements and for the local matching portions of Federal Airport Improvement Program grants. Funds cannot be used for operations or maintenance. Grants range from $10,000 to $500,000.

Total acquisition and development grant funding was $2.4 million in fiscal year 1995 for 17 grants (an average of $141,200). The current estimates of acquisition and development grants are as follows:

Fiscal Year	Grant Amount
1996	$2,078,000
1997	$1,878,000
1998	$1,878,000

There are 179 general aviation (including reliever) airports in California competing for these funds. Therefore, the average funding per airport was approximately $13,800 in fiscal year 1995, and decreasing to $10,500 in fiscal year 1996. The State's fiscal year ends on June 30 (as opposed to September 30 for the Federal government).

The California Transportation Commission annually establishes a local matching requirement that ranges from 10 to 50 percent of the non-Federal funded portion of the project cost. Since 1977/78, recipients have provided a minimum match of 10 percent of eligible project costs for acquisition and development projects.

Federal AIP Matching Grants. A third type of grant became effective October 1, 1994 and relates to AIP projects funded after this date. As explained previously, FAA AIP grants will typically cover 90 percent of eligible project costs for general aviation airports, which prior to October 1, 1994 left 10 percent of the project costs to be borne by the airport sponsor. The new state grants will provide five percent of the FAA grant to be used as part of the sponsor's matching share. This translates into 4.5 percent of typical project costs, which reduces the sponsor's matching share to 5.5 percent. It is expected that a total of $1.5 million will be available for these grants, and it is

noted that with the introduction of this program the amount available for Acquisition and Development grants has been reduced. Since the total funds available from the State essentially is fixed, it was necessary to change the distribution among the different grant programs. The amount available for A&D grants was reduced to accommodate the new AIP match program. In fiscal year 1995, only one Matching Grant for $200,000 was funded.

Revenue Generating Loans. Funds from Revenue Generating Loans may be used for any projects not eligible for funding under other programs and which are designed to improve airport self-sufficiency. Loans of this type cannot be used for "land banks," automobile access roads and auto parking facilities to accommodate airlines. The loan amounts are based upon an analysis of each individual application, after a public hearing is held, and subject to availability of funds.

Matching Fund Loans. Matching fund loans may be used for securing Federal AIP grants, and the loan amount equals the sponsor's share (5.5 percent) of project costs required to match a Federal grant. Requests for matching fund loans are given highest priority. Total loan funding (for both Revenue Generating and Matching Fund Loans) in fiscal year 1995 was $2.25 million for 17 projects (or an average of $132,400 per project). In the future, approximately $2 to 2.5 million per year can be expected to be available for loan funds.

3. Private Capital

Private funding is often available for certain airport improvements, including, most commonly, aircraft hangar construction. It is assumed that some of the future hangars and other FBO improvements at the Yolo County Airport will be constructed with private funds on property leased from the airport on a long-term basis. At the end of the lease period the ownership of the hangars could revert to the County or lessee, depending upon the terms of the airport's lease agreement.

4. Airport Revenues and County Funds

At Yolo County Airport, an enterprise fund is established to provide for general maintenance, improvements and other costs associated with the operation of a "non-commercial" airport. The fund is financed primarily through airport-generated revenues, the State annual grant and loans, Federal grants, and, when required, county contributions or loans.

B. CAPITAL IMPROVEMENTS PROGRAM

A summary of capital improvement costs is shown in Table 8-1. This exhibit describes the proposed investment in construction and expansion of facilities as called for in the Yolo County Airport Master Plan. For each of the three development stages or phases, it presents the estimated costs and projected timing of the improvements.

The total estimated costs of capital improvements are shown in 1995 dollars and in inflated dollars at the time (or year) construction is expected to occur, based on an assumed inflation rate of 2.4

Table 8-1
Summary of Costs
Capital Improvement Program
Yolo County Airport

	Capital Projects	1995 $ Total Cost	Inflated $ [a] Total Cost	% Funded w/ Federal/State Grants [b]	Cost Federal State Grant Share	Cost Local Share
STAGE I PROJECTS (1998-2002)						
A1	RWY 34 RPZ Easement	9,574	9,804	90%	8,824	980
A2	PAPI/VASI Installation	66,304	71,193	90%	64,074	7,119
A3	County Apron Expansion	595,328	639,318	90%	575,387	63,932
A4	T-Hangar Development	819,200	890,165	0%	-	890,165
A5	Rehabilitate Hardstand Taxilane	91,904	96,368	90%	86,731	9,637
A6	Hangar Development	(c)	(c)		(c)	(c)
A7	County Apron Expansion	382,336	391,512	90%	352,361	39,151
A8	Equip. Storage Area Fencing & Improvements	9,690	9,690	90%	8,721	969
A9	Helipad Site Development	50,220	51,425	90%	46,283	5,143
A10	Runway 16 RPZ Acquired in Fee	70,963	74,410	90%	66,969	7,441
A11	Future FBO Site Infrastructure (d,e)	117,760	127,961	90%	115,165	12,796
A12	Prestar Aviation Apron Expansion (e)	407,296	442,579	90%	398,321	44,258
A13	E.A.A. Apron Development	14,145	15,188	90%	13,669	1,519
A14	Woodland Aviation Apron Expansion (e)	416,256	447,014	90%	402,313	44,701
	SUBTOTAL -- STAGE 1 PROJECTS	3,050,976	3,266,629		2,138,818	1,127,811
STAGE II PROJECTS (2003-2007)						
B1	Terminal Building Development	485,600	608,358	0%	-	608,358
B2	Upgrade Perimeter Fencing	264,960	298,318	90%	268,487	29,832
B3	Instrument Runway Marking/HIRL Upgrade	161,280	190,406	90%	171,365	19,041
B4	County Apron Expansiuon	293,760	330,744	90%	297,670	33,074
B5	T-Hangar Development	614,400	725,491	0%	-	725,491
B6	Future FBO Sitre Infrastructure (N. Woodland Avn)	59,520	73,682	90%	66,314	7,368
B7	Slurry Seal Existing County Apron	11,904	13,403	90%	12,062	1,340
B8	Leasehold Site Infrastructure (N. of Prestar)	82,560	92,954	90%	83,659	9,295
B9	Leasehold Site Infrastructure (E Woodland Avn)	44,160	49,720	90%	44,748	4,972
B10	West Side Hangar Site Preparation/Development	189,798	218,823	90%	196,940	21,882
	SUBTOTAL -- STAGE II PROJECTS	2,207,942	2,601,900		1,141,245	1,460,654
STAGE III PROJECTS (2008-2015)						
C1	Infrastructure for Long-term Avn Dev (S. Woodland)	197,376	268,729	90%	241,856	26,873
C2	Resurface Runway	428,288	648,658	90%	583,792	64,866
C3	Resurface Apron Taxiway	149,057	236,718	90%	213,046	23,672
C4	Construction	792,448	1,166,832	90%	1,050,149	116,683
C5	MALS Approach Lighting	128,000	144,115	100%	144,115	-
	SUBTOTAL -- STAGE III PROJECTS	1,695,169	2,465,052		2,232,958	232,094
TOTAL MASTER PLAN PROJECTS		6,954,087	8,333,580		5,513,021	2,820,559

[a] Inflated $ costs are estimated costs at year of expected development, escalated at 2.4% per year, compounded.

[b] Federal and State grants are estimated at 90% of eligible project costs.

[c] Funded by private sources.

[d] Utilities only.

[e] Airport outlays recoverable through rent/lease structure.

percent [1], compounded; the development program is outlined in Appendix A. The inflated costs projected for each phase are divided into a public and private sector portion. Public sector investment is further divided into local share versus costs funded through State or Federal grants.

The capital improvements plan is presented in the three stages or phases consistent with those used throughout the master planning analyses. *It is important to remember that the real determinate of the specific timing of demand-related improvements (capacity oriented) is the actual demand/operations and/or based aircraft experienced. Therefore, the schedule presented does not commit the sponsor to provide such development until demand levels reach those projected in this study.*

C. REVENUES FROM AIRPORT ACTIVITIES

Revenues [1] are also generated by various activities at the airport. The sources of income are outlined below.

1. Rents and Concessions

The airport has four Fixed Base Operators (FBOs) [1] that provide income from ground leases, fuel flowage fees and percentage payments on sales. The airport also leases land to other lessees for non-aviation purposes.

Aviation-Related Ground Leases and Percentage of Sales. Salient features of the ground leases to the FBOs as well as the percentage payments on sales are depicted in Table 8-2.

Woodland Aviation has an option on an adjoining parcel (248,292 square feet) at the rate then in effect for the present parcel it now leases. In addition to the above, a small parcel is leased to the Experimental Aircraft Association for its hangar.

It may also be noted that all of the aviation-related ground leases have provisions for lease rate escalations based upon increases in the Consumer Price Index (CPI).

Non-Aviation Ground Leases. Features of non-aviation ground leases are also shown in Table 8-2. The Chamberlain Farms agricultural lease, on about 300 acres of land not being used by the airport, usually generates about $10,000 per year in lease revenue. This revenue source can vary considerably and the lease will eventually terminate when the land is needed for aviation purposes.

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[1] This is the average annual increase in Engineering News Record's ENR Building Cost Index over the past 10 years. For comparison, the -5-year average was 1.9%.

[2] Revenues from Yolo County General Fund contributions and Federal grants for specific projects are excluded.

[3] PreStar, Woodland Aviation, Yolo Aviation and Ingraham.

Table 8-2
SOURCES OF RENT AND CONCESSION REVENUES [1]

Lessee	Land Area and Rent	Escalation	Fuel Flowage	% of Sales	Lease Expiration Date and Options
PreStar	172,758 s.f. at $0.075/ s.f. / yr.	Annual CPI increase Starting July 1996	$0.015/gal. sold	1.25% gross over$500.000 excluding fuel sales	20 yrs.; expires 2009; option for additional 20yrs.
Woodland Aviation	409,464 s.f. at$0.06/s.f./yr. $0.06 / s.f. / yr.	Annual CPI increase each October	$0.02/gal. sold	N/A	40 yrs.; expires 2024; option for additional 40 yrs.
Yolo Aviation	Two parcels: 92,050.84 s.f. & 120,372.72 s.f. both at $0.034 / s.f.	CPI increase every third year starting August 1997	$0.015/gal. sold	0.5% for aircraft sales; parts sales & services; 2% for sub-rents	20 yrs.; expires 2014; option for . additional 20 yrs.
Ingraham	14,000 s.f. at $0.06/s.f./yr.	Annual CPI increase each January	N/A	0.5% for aircraft sales; 2% for sub-rents;parts sales; sales & services	10 yrs; expires 2004; option for additional 10 yrs.
Experimental Aircraft Association	14,400 s.f. at $0.07 / s.f. / yr.	Annual CPI increase each February	N/A	N/A	10 yrs.; expires 1999;option for. add'l.10 yrs.. Renegotiating for 20 yrs & option for additional 20 yrs.
Yolo Sports-mens Assoc.	2,678,940 s.f. at $0.002 / s.f. / yr.	None	N/A	N/A	30 yrs; expires 1998; no option for additional years
Chamberlain Farms	300 acres at $2,400/yr.or 25% of gross crop sales whichever is greater	None	N/A	25% gross crop sales or $2,400/yr. whichever is greater	3 yrs.; expires 1996; no option for additional yrs.Expect to renegotiate 3 yr.extension to 1999
West Plainfield FireDep't.	100,032.56 s.f.. at no cost	None	N/A	N/A	99 yrs.; expires 2064; no option for additional years
Through the-Fence	$240 annual access fee for revocable licence	None	N/A	N/A	10 yrs.; expires 2003; option to extend additional 10 years.

[1] Note : Revenues excluded from County -owned hangars and tie-downs

Source : Yolo County Airport

It may be noted that the Yolo Sportsmen's Association has an extremely favorable lease for its non-aviation recreational activities. The annual rent for the 61.5 acres leased is $0.002 cent per square foot (about $554/year) and there is no escalation rate. Moreover, the lease agreement provides for a rebate by the airport to the association for its annual Possessory Interest Tax Assessment (about $550/year). The net result is that for all practical purposes, there is no lease income from this leasehold. This 30-year lease expires in May, 1998 and there may be an opportunity for the airport to increase the rent at this time.

Another non-aviation lease that does not provide income is held by the West Plainfield Fire Department. However, the Fire Department: allows the airport to have free use of its meeting hall (Lillard Hall) for all airport meetings; provides annual brush clearing of the drainage channels on the airport; and, provides on-site emergency response for plane crashes, fires and personal injuries.

2. Fuel Flowage Fees

Fuel flowage fees (see Table 8-2) are derived from three FBOs. It may be noted, however, that these fees are based upon the amount of fuel sold. As such, it does not account for the fuel used by the FBOs for their own purposes. To account for this, some airports charge FBOs a fee based upon the number of gallons of fuel input or delivered to the FBO, not just for the gallons sold.

3. Aircraft Storage Fees

The airport owns 13 T-hangars. This includes 11 full T-hangars which rent for $160/month, and 2 one-half T-hangars which rent for $80/month each. It also has 9 apron tie-downs that it rents for $30/month to based aircraft, and $5/night to overnight transient aircraft. There is no provision in these rental agreements for price escalation.

4. Business Licenses and Permits

Revenue is also derived from other activities such as an annual license/permit for hot air balloons ($75/year), and a "through-the-fence" annual permit ($240/year) allowing access to the airport from a neighboring property. Crop dusters also pay an annual permit of $100 and load fees of $2/wet load and $1.50/dry load. The load fees, however, have been waived until the year 2003 to offset the cost of a loading pad constructed by the crop dusters.

5. Landing Fees

The airport also charges a hot air balloon launching/landing fee of $5.00. It does not impose a landing fee on engine-driven aircraft

6. State Aviation Grant

The airport also receives a $10,000 annual grant from the State of California Aviation Fund. This money is used for maintenance, operation and capital improvements at the airport.

7. Revenue Generation FY 1991/92 - FY 1994/95

Revenue generation during the Period FY 1991/92 through FY 1994/95 from the various sources is depicted in Table 8-3. To provide insight as to the reliability of this income stream, the various sources were categorized under the headings: "Predictable" (a reliable source and a relatively constant amount that could reasonably be expected each year); "Variable" (a reliable source but the amount of income derived therefrom can vary considerably); and "Non-Predictable" (sources which could end at almost any time).

It should be noted that the annual State grant from FY 1990/91 through FY 1993/94 was $5,000 per year. In reviewing the airport's financial statements, the amount shown from year-to-year varies due to differences in the period when the grant was received, accounting transfers, and the like. For purposes of illustration, the $5,000 per year grant was shown for the above-mentioned timeframe except for FY 1994/95 when the annual grant amount was increased to $10,000.

It should also be noted that of the various sources of income, the Predictable category accounted for roughly 80 percent of airport revenues. It would be highly desirable to increase this ratio as much as possible which could be done by having more rentable hangars and attracting more lessees.

D. AIRPORT OPERATING EXPENSES

Airport operating expenses include, salaries, services, supplies and long-term debt amortization. These are discussed below.

1. Salaries and Benefits

Salaries and benefits include personnel costs for the Airport Manager. Most other personnel support service costs are absorbed within other County departments.

2. Services and Supplies

This category includes liability insurance, allocated County services, utilities, operations, maintenance and all other services and supplies. These expenses do not include any allowance for depreciation.

3. Long-Term Debt and Interest

Long-term debt and interest includes three notes payable by the airport. The first note payable which has a balance of $80,000 is to the State of California for construction of hangars, and is scheduled for amortization in the year 2002. The second note payable with a balance of $387,208 is to the State of California Department of Commerce for construction of a water system at the airport and is scheduled for amortization in the year 2016. The third note payable, with a balance of $64,373, is to the State of California Department of Transportation, Division of Aeronautics,

Table 8-3
REVENUES FROM AIRPORT ACTIVITIES
FY1991/92 through FY1995/96

Revenues by Source	Actual					Budget
	FY1990/91	FY1991/92	FY1992/93	FY1993/94	FY1994/95 [1]	FY1995/96
Predictable						
Aircraft Storage Fees	21,100	16,595	22,540	24,302	25,514	24,840
R&C [2] (Ground leases)	62,414	27,682	55,100	52,215	45,198	50,940
Annual State Grants	5,000	5,000	5,000	5,000	10,000	10,000
Subtotal	88,514	49,277	82,640	81,517	80,712	85,780
Variable						
R&C (% Sales)	3,527	17,793	3,784	6,017	4,360	10,800
R&C (Fuel flowage)	307	4,358	991	1,131	1,493	1,550
R&C (Agricultural lease)	[3]	8,803	7,502	11,410	13,337	6,500
Subtotal	3,834	30,954	12,277	18,558	19,190	18,850
Non-Predictable						
Business Licenses/Permits		350	525	300	2,800	600
Landing Fees	1,420	1,836	4,366	173	782	450
Subtotal	1,420	2,186	4,891	473	3,582	1,050
TOTALS	93,768	82,417	99,808	100,548	103,484	105,680

[1] Draft audit results
[2] R&C = rents and concessions.
[3] Included in R&C (Ground leases)

Source : Yolo County Airport.

for the airport's share of a $695,000 grant for a master plan and taxiway. This note has a term of eight years requiring varying annual payments of $9,844 to $11,419 that began January 1, 1995.

4. Airport Operating Costs: FY 1990/91 to FY 1995/96

Historical operating expenses over the past five years and the FY 1995/96 budget are shown in Table 8-4. As may be noted, expenses have increased from $57,411 in FY 1990/91 to an estimated $144,886 in FY 1995/96. Moreover, expenses in recent years have exceeded revenues by 35%-39%, pointing out the need to increase the "Predictable" revenue base.

E. AIRPORT LEASE EVALUATION

As noted above, the airport has entered into a number of lease agreements. To provide a framework for this evaluation, the key features that should guide any lease arrangement, especially a lease of airport property, are outline below.

1. Key Lease Features

The key features to be considered are founded on certain basic principles. These are described as follows:

Basic Lease Principles. The basic principle underlying any real estate lease is that it should be a sound business arrangement in line with good real estate management practices. The lease terms should consider the short and long-term financial impact of the arrangement, public acceptance, physical appearance of any leasehold facility, and a continuing relationship with the other party. This is especially important with respect to leases with FBOs as the lease must make financial sense not only to the FBO but also to lenders who make loans for improvements and development of business.

With respect to airport property management, however, where the owner receives Federal grant assistance, there are other obligations wherein the owner is more than a passive landlord of specialized real estate. In this situation, the owner is obligated to comply with a number of assurances with respect to aeronautical use, maintenance and operations, use of airport property, and others necessary to preserve the rights and powers needed to perform the covenants in the agreement with the United States Government.

For the purposes of this analysis, the most pertinent guidelines set forth by the Federal Aviation Administration (FAA) require that:

- The owner operates the airport for the use and benefit of the public and makes it available to all types of aeronautical activity on fair and reasonable terms without unjust discrimination.

Table 8-4
AIRPORT OPERATING EXPENSES [1]
ACTUAL FY 1990/91 - FY 1994/95 and BUDGETED FOR FY 1995/96

Airport Expense	Actual					Budget
	FY90/91	FY91/92	FY92/93	FY93/94	FY94/95 [2]	FY95/96
Salaries & Benefits	16,414	5,565	28,212	52,556	54,837	58,320
Services & Supplies [3]	16,815	33,840	46,591	39,623	32,081	33,171
Long Term Debt & Interest [4]	24,182	28,642	45,632	47,630	53,189	53,395
TOTALS	57,411	67,687	120,435	139,809	140,107	144,886

Source : Yolo County Airport

[1] Excludes depreciation

[2] Draft audit results

[3] Includes maintenance and operations costs

[4] Note payable balance ($80,000) to State of California for construction of hangars (scheduled for amortization in the year 2002); a note payable balance ($387,205) to the State of California Department of Commerce for construction of a water system at the Airport (scheduled for amortization in the year 2016); and a note payable balance ($64,373) to the California Department of Transportation, Division of Aeronautics, which is being used to fund the Airport's share of the $695,000 grant for a master plan and a taxiway.

- The owner makes the facilities and services available at rates and charges that are fair and reasonable and applied without economic or any other type of discrimination.

- The owner operates the airport to be as financially self-sustaining as possible.

- There is no actual or proposed development of use of land and facilities contrary to an Airport Layout Plan (ALP) previously approved by the FAA.

The lease agreement does not relieve the owner of its obligations, rights and powers under its agreement with the Federal Government.

Rights or Privileges of Lessor and Lessee. The basic obligation of the public airport owner (lessor) is to make available to the public the aircraft landing and parking areas. However, the owner has the right to recover the cost of providing these facilities through fair and reasonable fees, rentals and other user charges. From the standpoint of the tenant (lessee) it is important that the terms of the lease be designed to give it sufficient latitude to operate it's business and survive financially. Airport lease agreements usually reflect a grant by the owner (lessor) to the tenant (lessee) the three basic rights or privileges for an appropriate monetary consideration:

- The right for the tenant to use the landing area and public airport facilities in common with others so authorized.

- The right to occupy as a tenant and to use exclusively certain designated premises on the airport.

- The commercial privilege or franchise right to offer goods and services to the public who use the airport.

Likewise, the right of the tenant (lessee) with respect to the establishment of the fees, rentals, etc. is that the rates, terms and conditions are non-discriminatory. However, it is the responsibility of the airport owner, in negotiating the privilege to offer these services and commodities at the airport, to retain sufficient control over the operation to guarantee that the patrons will be treated fairly. The owner may not have this control if, by contract or otherwise, it surrenders the right to approve rates, fees, and charges imposed for essential aeronautical services.

It should be noted that the obligation of the airport owner to ensure availability of services to the public on fair and reasonable terms is limited to aeronautical activities. There is no requirement in a grant agreement or deed with the Federal Government that the prices charged for non-aeronautical concessions be controlled.

It is also important to note that this obligation to make an airport available for the use and benefit of the public does not impose any requirement to permit access by aircraft from adjacent property. The existence of such a "through-the-fence" arrangement could place an encumbrance upon the airport property unless the airport owner requires the off-site property owner or occupant to conform in all respects to the requirements of an existing or proposed grant agreement.

From a safety standpoint, arrangements that permit aircraft to gain access to a public landing area from off-site properties could complicate the control of vehicular and aircraft traffic. Special safety operational requirements may need to be incorporated in the "through-the-fence" agreement. In fact, the FAA, as a general rule, recommends that airport owners refrain from entering into such agreements, but will approve them if sufficient safety restrictions are included.

The owner also has a right (with prior FAA approval) to lease airport property for non-aviation purposes until such time as it is needed for its primary aeronautical purpose. Such approval, however, does not release the property from any term, condition, or covenant of the applicable compliance agreement with the Federal Government. Any option to renew an interim use lease agreement should be conditioned on obtaining a new FAA determination that the property will not be needed for any aviation use during the proposed renewal period. Investment by the interim user is at its risk and is not a factor in considering renewal of a lease or use agreement.

Term of Lease. To conform with the realities of lending institution financing, the lease term should extend for a period long enough to permit amortization of loans made for physical improvements on the property and erection of hangars, buildings, and the like. Financing experience has shown that 15 years is the minimum term accepted by most lenders for major improvements. A 20-year lease, with options to extend, is preferable.

From the perspective of the lessor, a long-term lease for a key aviation service is desirable, so long as fair market rentals are being achieved.

Lease Rates and Charges. As noted above, the obligation to make an airport available for public use does not preclude the owner from recovering the cost of providing the facility or service through fair and reasonable fees, lease rates or other user charges which make the airport as financially self-sufficient as possible. However, each tenant (i.e., FBO) must be charged the same rates, fees and charges as all other FBOs making the same or similar uses of the airport or utilizing the same or similar facilities. In establishing these rates and charges; a variety of factors must be considered. For example, differences in the values of properties involved and the extent of common facilities usage must be considered; seldom will each user have properties of the same value nor will their use of the common facilities be the same. To justify noncomparable rates, the owner must show that the differences are substantial.

Another example would be if one operator rents hangar space and another builds its own facilities; this would provide justification for different rental and fee structures. These two operators would not be considered similar as to rates and charges even though they offer the same services to the public.

Also, if one FBO is situated in what is considered a prime location and another FBO is in a less advantageous area, there could logically be a differential in the fees and charges to reflect this advantage of location. This factor would also influence the rental value of the property.

In addition, even if two FBOs are both providing primary commercial services, they may have dissimilar requirements, i.e., space needs, building construction, or location. Therefore, different rates may be acceptable, although the rates must be equitable.

Lease Rate Adjustment. It is important to note that all leases, especially those with a term exceeding five years, should provide for periodic review of the rates and charges and adjustment (based upon an acceptable index) to reflect the then current values. This periodic lease review will facilitate parity of rates and charges between new FBO services coming on the airport and the existing operators. It will also assist in making the airport as financially self-sustaining as possible under the circumstances existing at the airport.

Leasing Aprons Constructed with Federal Assistance. As noted above, the owner has the responsibility for the management and operation of the airport and must assure it is operated in accordance with all aspects of the Federal grant assurances. As such, the owner can not enter into unconditional leasing of apron areas constructed with Federal grant assistance since it would impair its ability to comply with its obligations to the Federal Government.

Apron space or tie-downs on the apron can be leased by the owner to individual aircraft owners and/or to FBOs for space necessary to serve the needs of their aircraft in their business. Also, the apron area in the immediate vicinity of an FBO can be leased to the FBO to permit the exercise of his/her business over the public-use ramp area. However, the lease terms must not restrict the owner from carrying out its grant obligations and must ensure that the public will be served by the lessee in a manner consistent with the grant agreement.

A point worth mentioning is that the installation of portable hangars and sunshades on Federally-funded aprons is prohibited, except when specifically approved by the FAA. Such hangars and/or sunshades, if approved, must be designed for ready-removal (no foundation or footing); not cause damage to the apron and, meet other FAA criteria.

Insurance Requirements. It is normal that the lease require indemnity insurance holding the lessor harmless from all claims, risks, accidents, or injuries caused by the lessee or its employees acting on its behalf in the operation of the leasehold business.

The lease should also give the lessee and its customers the rights of ingress, egress, and of free access to the premises, as well as "peaceful possession and quiet enjoyment" thereof. There should also be an assurance that the lessor will continue to operate the airport as a public airport consistent with government regulations, and there will be no restrictions on normal operations which might apply to the proposed leasehold during the term of the lease.

Requirement to Make Improvements. In the case of leases with FBOs, the lease agreement should contain language that obligates the lessee to provide physical improvements and installations on the premises, including refurbishing existing structures and/or the erection of new structures and to do so within a certain time period.

Right of Prior Approval and Conformance to Design Criteria. The lease should also give the lessor the right of prior approval of all architectural/engineering plans and designs for improvements, as well as any contractor to be selected by the lessee to construct the improvements. Requirements relating to site improvements, exterior design, building height, paint schemes, signage, etc. should also be part of the lease agreement.

Maintenance and Repairs of Leasehold. The lease should specify which party is financially responsible for repairs and maintenance of the leased premises. In some cases, the lessor pays for structural repairs and specific major items and the lessee pays for maintenance needed because of ordinary wear and tear. If the lessee does not perform the required maintenance and repairs, the lessor should have the right to enter the premises to perform the necessary work at the lessee's expense.

Fire Loss. Most leases require the lessee to replace buildings or facilities destroyed by fire and to return them to the pre-damaged conditions so that the replacement is equivalent in value to the original facilities. Normally, the lease will require 75-80 percent fire and extended coverage and lessee liability coverage with insurance companies approved by the lessor. The lessor should also be named on the insurance certificates as an additional insured.

Ownership and Removal of Improvements After Termination. The lease should also specify in whom title to the various improvements will vest upon leasehold termination. If ownership of improvements do not revert to the lessor, then there should be the requirement for lessee removal of all or certain structures, fixtures or equipment on the site. Ordinarily, a stated time is given to the lessee to do this and vacate the premises. If the lessee fails to do so within the allotted time, the lease should allow the lessor to remove the lessee's property with liability to the lessee, or provide that such property will become the property of the lessor.

2. Evaluation of Existing Airport Leases

A review was made of the existing leases at Yolo County Airport. The findings with respect to the above noted guidelines are as follows:

- All FBO and private development aviation-related leases have or should have escalation clauses to adjust rates in the future. The adjustments are based upon changes in the Consumer Price Index (CPI).

- County-owned hangar and tie-down agreements do not have automatic rental rate adjustment clauses based upon a recognized index. Rather, the rates are adjusted from time-to-time by the Board of Supervisors based upon recommendation of Airport Management which considers charges at competing airports and other market factors.

- The Yolo Sportsmen's Association below market lease rate violates FAA requirements for market rate leases. This lease should be renegotiated to achieve fair market rents.

- The West Plainfield Fire Department lease at zero rent also violates FAA requirements. However, it may be possible to develop a lease arrangement wherein the cost of providing fire protection and emergency medical services and brush clearing/burning services equates to the value of a market rate lease. This possibility must be worked out with the FAA.

- Term of leases (for those with leasehold improvements) range from 10 years (EAA) to 99 years (West Plainfield Fire Department).

- All airport FBO and private development leases require adequate general liability and property insurance (full replacement) relative to risks of loss as well as verification of coverage. FBO leases also provide for the lessee to carry Workers Compensation insurance.

- The FBO leases specify responsibility for maintenance and operations relative to the leasehold.

- All FBO and private development leases have provisions relative to ownership and removal of improvements at time of lease termination.

- None of the FBO or private development leases have a requirement to make improvements during a certain timeframe, or give the County the right of prior approval of, or require adherence to specific site/building design criteria. These requirements should be included.

- County-owned hangar and tie-down leases provide for maintenance and repair by the owner and space clean-up by the lessee. They also require the lessee to provide: indemnification of the County for various occurrences; liability insurance ($300,000 minimum); and property damage ($100,000 minimum). This coverage is considered adequate. Verification of insurance coverage is also required.

- The "Through-the-Fence" lease contains appropriate restrictions and has been approved by the FAA.

3. Lease Rates and Charges at Competitive Airports

A survey of current rates and charges at selected general aviation airports in California was undertaken to evaluate the comparability with Yolo County Airport's rates and charges. A copy of the survey form is included in Appendix B.

A total of 36 airports were contacted, of which 14 responded. The survey results are summarized and compared with Yolo County Airport's rates and charges in Table 8-5. As may be noted, the airport's rates and charges generally fall at or below the average rate and charge for specific categories.

For instance, Yolo County rents for existing hangars ($160/month) are slightly below the average ($163), but rents for new hangars could average $190/month. Yolo County tie-down rents

Table 8-5
SUMMARY OF GENERAL AVIATION AIRPORT SURVEY RESPONSES

		# Responses	Range	Average	Yolo County Airport
Airport Activity (1995)					
Operations		13	16,000-232,200	71,000	60,000
Based Aircraft		12	34-564	187	70
FBO Revenues					
Ground Rent	$/sf/year	7	0.07 - 1.51	0.44	0.034 - 0.075
Hangar Rent	$/sf/year	4	0.16 - 0.72	0.33	--
Fuel Flowage	%/gallon sold	7	0.02 - 0.06	0.05	0.015 - 0.02
% Gross Sales		4	1% - 10%	4.0%	0.5% - 2.0%
Private Hangar Rent		2	0.017 - 0.40	0.17	--
Lease Escalation Clause					
CPI		6	adjusted every 1 - 5 years	N/A	Varies
Other		1	25% every 5 years	N/A	
Airport Owned Hangar Rentals					
Full T	$/month	13	40 - 318	163	160
New Full T	$/month	2	175 - 197	186	--
1/2 T	$/month	5	25 - 205	110	80
Small Rectangle	$/month	3	202 - 440	327	--
Large Rectangle	$/month	7	160 - 950	406	--
Waiting List	# aircraft	13	5 - 200	51	10
Airport Owned Tiedowns					
Monthly	$/month	11	22 - 85	42	30
Overnight	$/night	12	2 - 13	5.00	5.00
Landing Fees					
General Aviation Revenue Flights	$/1,000 lbs GLW	4	1 - 10	5.20	--
Airport Terminal Rents					
Office[1]	$/sf/month	5	0.70 - 2.00	1.11	--
	$/month	2	300 - 594	447	--

[1] Includes restaurant and gift shop
SOURCE: P&D survey, December 1995/January 1996.

($30/month) could be increased somewhat, but with only 9 existing apron tie-downs, the increase in revenue would not be significant. FBO ground leases, fuel flowage fees, and percent of sales charges are significantly lower than the average. Increases, however, are limited by the terms of the existing leases. For new leases, higher rates should be based upon a fair market real estate appraisal of the parcel being rented.

F. PRO FORMA CASH FLOW AND FUNDING REQUIREMENTS

Pro-forma cash flow analyses were prepared to evaluate the potential funding needed to implement the airport development program. This was done for three alternative programs.

1. Alternative 1: Base Case

The underlying assumptions were as follows:

Aviation Activity. Future aviation activity at the airport is assumed to occur in-line with the Enhanced Case aviation demand forecast, outlined in Section 3 of the Master Plan report. Under this forecast, annual aircraft operations are projected to increase from 60,000 in 1994 to almost 79,000 by 2005, the first ten years of the plan's twenty-year horizon. Based aircraft are projected to increase from 70 in 1994 to 106 in 2005.

Operating Revenues. Operating revenues are projected based upon the following assumptions:

- To generate additional aircraft storage fees, the airport will pursue the T-hangar and tiedown development program shown in Table 8-6. Existing T-hangars will rent for $160/month (in 1995 dollars); new T-hangars will rent for $190/month (in 1995 dollars). Existing and new tiedowns will rent for $30/month (in 1995 dollars). Monthly rents will increase in-line with inflation, assumed to be 3.4 percent per year, compounded (the average annual increase in the Consumer Price Index in the San Francisco Bay area between 1989 and 1994).

- Aviation and non-aviation ground lease revenues will increase over 1995 levels in-line with inflation, assumed to be 3.4 percent per year, compounded.

- The annual State grant will remain constant at $10,000 per year.

- Rents and concessions from percent of sales will increase in-line with projected increases in aircraft operations, adjusted for inflation, assumed to be 3.4 percent per year, compounded.

- Rents and concessions from fuel flowage will increase in-line with projected increases in aircraft operations, adjusted for inflation, assumed to be 3.4 percent per year, compounded.

Table 8-6
AIRPORT OWNED T - HANGAR AND TIEDOWN DEVELOPMENT PROGRAM

ITEMS		FY 95/96	FY 96/97	FY 97/98	FY 98/99	FY 99/00	FY 00/01	FY 01/02	FY 02/03	FY 03/04	FY 04/05	FY 05/06
T-Hangars												
	Current	13	13	13	13	13	33	53	53	63	73	83
	New					20	20		10	10	10	
	Total	13	13	13	13	33	53	53	63	73	83	83
	Existing	13	13	13	13	13	13	13	13	13	13	13
	New	0	0	0	0	20	40	40	50	60	70	70
Tiedowns												
	Current	10	10	10	10	21	22	23	24	24	25	26
	New				11	1	1	1	0	1	1	1
	Total	10	10	10	21	22	23	24	24	25	26	27
	Existing	10	10	10	10	10	10	10	10	10	10	10
	New	0	0	0	11	12	13	14	14	15	16	17

[1] Assumes future demand based on Enhanced Aviation Forecast.
Source: P&D Consultants, Inc.

- Business license/permit revenues will remain constant.

- Landing fees from balloon operations are assumed to remain constant at $450 per year.

Operating Expenses. It is not anticipated that the Master Plan projects will require substantial additional personnel or services and supplies. Therefore, these cost items were projected to increase in-line with inflation, assumed to be 3.4 percent per year, compounded (the average annual increase in the Consumer Price Index in the San Francisco Bay area between 1989 and 1994). Existing long-term debt and interest expenses were projected from financial statements provided by Yolo County Airport.

Capital Improvements. Capital improvements were assumed to occur per the schedule previously outlined in Section 7 of this report. The local share of the improvement program was assumed to be funded through current revenues and/or County contributions. **[1]**

Cash Flow and Funding Requirements. Using the cost and revenue assumptions outlined above, the Base Case Analysis yields a net funding requirement through FY 1998/99 (see Table 8-7). Thereafter, through FY 2005/06, the airport generates a net operating surplus. Local funding requirements to complete the capital improvement program total $1.78 million over the 10-year period.

2. Alternative 2: Enhanced Revenues

With this alternative, it was assumed that operating revenues were enhanced as follows:

- Non-aviation ground lease revenue from the 61.5 acre Yolo County Sportsmen's Club parcel will increase from $0.002/square foot/year to $0.02/square foot/year in FY 1999/2000. No additional income was assumed from the West Plainfield Fire Department. **[1]**

- A fuel input fee of $0.015/gallon delivered will replace the current fuel flowage fee of $0.015/gallon sold. Based on information provided by the Yolo County Airport, fuel sold represents an average of 37 percent of total fuel delivered. Therefore, fuel input fee revenues were increased to reflect the additional fuel subject to the fee.

All other costs and revenue assumptions are per the Base Case Analysis.

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[1] It should be noted that there are four programs (State Acquisition and Development Grants, Federal AIP Matching Grants, State Matching Fund Loans, and State low interest development loans discussed in Section 8) which may be available to assist with funding of the local share of the capital improvement program. However, due to the variable nature of funding under these programs, it was considered too speculative to assume the use of these sources. However, funding from these programs should be pursued and could offset some of the local share funding requirements.

[2] It was assumed that any lease income would be offset by the cost of services provided by the Fire Department.

TABLE 8-7
BASE CASE
PROFORMA CASH FLOW & FUNDING REQUIREMENTS
FY 1995/96 - FY 2005/06

Costs and Revenues	FY 95/96 [1]	FY 96/97	FY 97/98	FY 98/99	FY 99/00	FY 00/01	FY 01/02	FY 02/03	FY 03/04	FY 04/05	FY 05/06
OPERATING REVENUES											
Aircraft Storage Fees	24,840	29,531	30,535	35,951	89,710	147,083	152,524	186,522	223,126	262,004	271,415
R&C (Ground Leases)											
Aviation	40,386	46,929	48,525	50,175	51,880	53,644	55,468	57,354	59,304	61,321	63,406
Non-Aviation	17,054	17,054	17,054	17,634	18,233	18,853	19,494	20,157	20,842	21,551	22,284
Annual State Grant	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
R&C (% Sales)	10,800	11,498	12,232	13,002	13,810	14,659	15,597	16,582	17,616	18,702	19,841
R&C (Fuel Flowage)	1,550	1,650	1,756	1,866	1,982	2,104	2,238	2,380	2,528	2,684	2,847
Business Licenses/Permits	600	600	600	600	600	600	600	600	600	600	600
Landing Fees	450	450	450	450	450	450	450	450	450	450	450
Gross Operating Revenues	105,680	117,713	121,151	129,678	186,666	247,393	256,372	294,046	334,468	377,311	390,842
OPERATING EXPENSES [2]											
Salaries & Benefits	58,320	60,303	62,353	64,473	66,665	68,932	71,276	73,699	76,205	78,796	81,475
Services & Supplies	33,171	34,299	35,465	36,671	37,918	39,207	40,540	41,918	43,343	44,817	46,341
Long-Term Debt & Interest [3]	53,395	53,395	53,395	53,395	53,395	53,395	53,395	27,997	27,997	27,997	27,997
Gross Operating Expenses	144,886	147,997	151,213	154,539	157,978	161,534	165,210	143,614	147,545	151,610	155,813
NET OPERATING REVENUES	(39,206)	(30,284)	(30,062)	(24,861)	28,689	85,860	91,162	150,431	186,923	225,702	235,030
CAPITAL EXPENDITURES	72,464	45,274	43,596	530,940	507,031	78,514	258,001	260,826	247,588	307,940	307,786
FUNDING REQUIREMENTS											
ANNUAL	(111,670)	(75,558)	(73,658)	(555,801)	(478,342)	7,346	(166,839)	(110,395)	(60,665)	(82,238)	(72,756)
CUMULATIVE	(111,670)	(187,228)	(260,886)	(816,687)	(1,295,029)	(1,287,684)	(1,454,523)	(1,564,918)	(1,625,583)	(1,707,822)	(1,780,578)

[1] Current budget.
[2] Excludes depreciation.
[3] Includes all notes payable.

SOURCE: P&D Consultants, Inc.

Cash Flow and Funding Requirements. Using the cost and revenue assumptions outlined above, the Enhanced Revenue Analysis yields a net funding requirement through FY 1998/99 (see Table 8-8). Thereafter through FY 2005/06, the airport generates a net operating surplus. The revenue enhancements in this alternative reduce the local funding requirements to complete the capital improvement program to almost $1.33 million over the 10 year period.

3. Alternative 3: Enhanced Revenues and Hangar Financing

The assumptions underlying this alternative are as follows:

T-Hangar Development. Under this alternative, the T-hangar development program is assumed to be completely financed through the State Revenue Generating Loan Program. Revenues generated from facilities financed under this program are required to cover the amount of debt service incurred. Based on existing State loan terms, financing is assumed at 6.0 percent per annum, compounded annually, with a 15 year amortization period. As may be noted in Table 8-9, revenues from new T-hangar rentals are expected to cover the debt service and generate a surplus to the airport.

All other costs and revenue assumptions are per the Enhanced Revenue Analysis (Alternative 2).

Cash Flow and Funding Requirements. Using the cost and revenue assumptions outlined above, Alternative 3 yields a net funding requirement through FY 1999/2000 (see Table 8-10). Thereafter through FY 2005/06, the airport generates a net operating surplus. This alternative reduces local funding requirements to complete the capital improvement program to $696,000 over the 10 year period.

G. MINIMUM DEVELOPMENT PROGRAM

Pro-forma cash flow analyses were prepared for two additional alternative programs to evaluate the potential funding needs generated by a minimum airport development program, as follows:

1. Alternative 4: Base Case Minimum Development Program

The assumptions for this alternative are shown below.

Aviation Activity. The Enhanced Case Aviation Forecast assumed the full capital improvements program was completed at Yolo County Airport. Therefore, because this alternative envisions a minimal development program, future aviation activity at the airport is assumed to occur in-line with the Base Case Aviation forecast, outlined in Section 3 of the Master Plan report. Under this forecast, annual aircraft operations are projected to increase from 60,000 in 1994 to 69,300 by 2005. Based aircraft are projected to increase from 70 in 1994 to 91 in 2005.

Capital Improvements. Only revenue generating capital improvements are undertaken with this alternative. This includes the T-hangar development and County apron expansion, which also

Table 8-8
ENHANCED REVENUE ALTERNATIVE
PROFORMA CASH FLOW & FUNDING REQUIREMENTS
FY 1995/96 - FY 2005/06

Costs and Revenues	95/96 [1]	96/97	97/98	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06
OPERATING REVENUES											
Aircraft Storage Fees	24,840	29,531	30,535	35,951	89,710	147,083	152,524	186,522	223,126	262,004	271,415
R&C (Ground Leases)											
Aviation	40,386	46,929	48,525	50,175	51,880	53,644	55,468	57,354	59,304	61,321	63,406
Non-Aviation [4]	17,054	17,054	17,054	17,634	71,812	74,254	76,778	79,389	82,088	84,879	87,765
Annual State Grant	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
R&C (% Sales)	10,800	11,498	12,232	13,002	13,810	14,659	15,597	16,582	17,616	18,702	19,841
R&C (Fuel Input) [5]	1,550	4,456	4,740	5,038	5,352	5,680	6,044	6,426	6,826	7,247	7,688
Business Licenses/Permits	600	600	600	600	600	600	600	600	600	600	600
Landing Fees	450	450	450	450	450	450	450	450	450	450	450
Gross Operating Revenues	105,680	120,518	124,136	132,850	243,615	306,370	317,462	357,323	400,011	445,202	461,164
OPERATING EXPENSES [2]											
Salaries & Benefits	58,320	60,303	62,353	64,473	66,665	68,932	71,276	73,699	76,205	78,796	81,475
Services & Supplies	33,171	34,299	35,465	36,671	37,918	39,207	40,540	41,918	43,343	44,817	46,341
Long-Term Debt & Interest [3]	53,395	53,395	53,395	53,395	53,395	53,395	53,395	27,997	27,997	27,997	27,997
Gross Operating Expenses	144,886	147,997	151,213	154,539	157,978	161,534	165,210	143,614	147,545	151,610	155,813
NET OPERATING REVENUES	(39,206)	(27,478)	(27,077)	(21,689)	85,637	144,837	152,251	213,709	252,466	293,593	305,352
CAPITAL EXPENDITURES	72,464	45,274	43,596	530,940	507,031	78,514	258,001	260,826	247,588	307,940	307,786
FUNDING REQUIREMENTS											
ANNUAL	(111,670)	(72,752)	(70,673)	(552,629)	(421,394)	66,323	(105,750)	(47,117)	4,878	(14,347)	(2,434)
CUMULATIVE	(111,670)	(184,422)	(255,096)	(807,725)	(1,229,119)	(1,162,797)	(1,268,546)	(1,315,663)	(1,310,785)	(1,325,133)	(1,327,567)

[1] Current budget.

[2] Excludes depreciation.

[3] Includes all notes payable.

[4] Assumes market rate lease revenues from Yolo County Sportsmens Association (beginning in FY 1999/2000).

[5] Assumes imposition of fuel input fee beginning in FY 1996/97.

Source : P&D Consultants, Inc.

Table 8-9
POTENTIAL REVENUE GENERATION FROM NEW AIRPORT OWNED AND DEVELOPED T - HANGARS

ITEMS	FY 95/96 [1]	FY 96/97	FY 97/98	FY 98/99	FY 99/00	FY 00/01	FY 01/02	FY 02/03	FY 03/04	FY 04/05	FY 05/06
New T-Hangars											
Annual	0	0	0	0	20	20	0	10	10	10	0
Cumulative	0	0	0	0	20	40	40	50	60	70	70
Monthly Rate (current $) [1]	190	196	203	210	217	225	232	240	248	257	265
Gross New T-Hangar Rental Income		-	-	-	52,125	107,795	111,460	144,062	178,752	215,634	222,966
New T-Hangar Development Cost											
Current $	-	-		439,805	450,360		236,118	241,785	247,588		
Cumulative Debt	-	-	-	439,805	890,165	890,165	1,126,283	1,368,068	1,615,656	1,615,656	1,615,656
Loan Payment [2]	-	-	-	45,284	91,654	91,654	115,965	140,860	166,352	166,352	166,352
Net New T-Hangar Revenue (Gross Revenue - Loan Payment)											
Annual	-	-	-	(45,284)	(39,529)	16,141	(4,505)	3,202	12,399	49,282	56,613
Cumulative	-	-	-	(45,284)	(84,812)	(68,671)	(73,177)	(69,975)	(57,576)	(8,294)	48,319

Source : P&D Consultants, Inc.

[1] Assumes rental rates increase at 3.4% per annum, compounded.

[2] Assumes cumulative T-Hanagar development cost is financed with a State loan at 6.0% over 15 years, compounded annually.

TABLE 8-10
ENHANCED REVENUE + FINANCED HANGAR DEVELOPMENT ALTERNATIVE
PROFORMA CASH FLOW & FUNDING REQUIREMENTS
FY 1995/96 - FY 2005/06

Costs and Revenues	FY 95/96 [1]	FY 96/97	FY 97/98	FY 98/99	FY 99/00	FY 00/01	FY 01/02	FY 02/03	FY 03/04	FY 04/05	FY 05/06
OPERATING REVENUES											
Aircraft Storage Fees	24,840	29,531	30,535	35,951	89,710	147,083	152,524	186,522	223,126	262,004	271,415
R&C (Ground Leases)											
Aviation	40,386	46,929	48,525	50,175	51,880	53,644	55,468	57,354	59,304	61,321	63,406
Non-Aviation [4]	17,054	17,054	17,054	17,634	71,812	74,254	76,778	79,389	82,088	84,879	87,765
Annual State Grant	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
R&C (% Sales)	10,800	11,498	12,232	13,002	13,810	14,659	15,597	16,582	17,616	18,702	19,841
R&C (Fuel Input) [5]	1,550	4,456	4,740	5,038	5,352	5,680	6,044	6,426	6,826	7,247	7,688
Business Licenses/Permits	600	600	600	600	600	600	600	600	600	600	600
Landing Fees	450	450	450	450	450	450	450	450	450	450	450
Gross Operating Revenues	105,680	120,518	124,136	132,850	243,615	306,370	317,462	357,323	400,011	445,202	461,164
OPERATING EXPENSES [2]											
Salaries & Benefits	58,320	60,303	62,353	64,473	66,665	68,932	71,276	73,699	76,205	78,796	81,475
Services & Supplies	33,171	34,299	35,465	36,671	37,918	39,207	40,540	41,918	43,343	44,817	46,341
Long-Term Debt & Interest [3]											
Existing	53,395	53,395	53,395	53,395	53,395	53,395	53,395	27,997	27,997	27,997	27,997
T-Hangar Development [6]	-	-	-	45,284	91,654	91,654	115,965	140,860	166,352	166,352	166,352
Gross Operating Expenses	144,886	147,997	151,213	199,823	249,632	253,188	281,176	284,474	313,898	317,962	322,165
NET OPERATING REVENUES	(39,206)	(27,478)	(27,077)	(66,973)	(6,017)	53,183	36,286	72,849	86,114	127,240	138,999
CAPITAL EXPENDITURES [7]	72,464	45,274	43,596	91,135	56,671	78,514	21,883	19,041	-	307,940	307,786
FUNDING REQUIREMENTS											
ANNUAL	(111,670)	(72,752)	(70,673)	(158,108)	(62,688)	(25,331)	14,403	53,808	86,114	(180,700)	(168,787)
CUMULATIVE	(111,670)	(184,422)	(255,096)	(413,203)	(475,891)	(501,223)	(486,820)	(433,012)	(346,898)	(527,598)	(696,385)

[1] Current budget.
[2] Excludes depreciation.
[3] Includes all notes payable.
[4] Assumes market rate lease revenues from Yolo County Sportsmens Association (beginning in FY 1999/2000).
[5] Assumes imposition of fuel input fee beginning in FY 1996/97.
[6] Assumes T-Hangar development cost is financed with a State loan at 6.0% over 15 years, compounded annually.
[7] Excludes T-Hangar development cost.

SOURCE: P&D Consultants, Inc.

includes additional aircraft tiedowns. Due to the lower future aviation activity expected under this alternative, 10 fewer T-hangars and 3 fewer tiedowns are needed over the forecast period. Therefore, the cost for 10 T-hangars has been removed from the development program. However, it is not expected that the cost for the County apron expansion would be significantly lowered due to the lower demand for aircraft tiedowns.

As with Alternative 3, the T-hangar development program is assumed to be financed with a State loan, while the local share of the apron expansion is assumed to be funded through airport revenues or County contributions. All other cost and revenue assumptions are per the Base Case Analysis (Alternative 1).

Cash Flow and Funding Requirements. Using the cost and revenue assumptions outlined above, Alternative 4 yields a net funding requirement through FY 2001/02 (see Table 8-11). Thereafter through FY 2005/06, the airport generates a net operating surplus. Local funding requirements to complete the minimal capital improvement program total $212,000 over the 10 year period.

2. Alternative 5: Enhanced Revenue Minimum Development Program

For this alternative, the following were assumed.

Aviation Activity, Costs and Revenues. Future aviation activity and the capital improvements program at the airport are assumed to occur per Alternative 4. All other cost and revenue assumptions are per the Enhanced Revenue Analysis (Alternative 2).

Cash Flow and Funding Requirements. Using the cost and revenue assumptions outlined above, Alternative 5 yields a net funding requirement through FY 1999/2000 (see Table 8-12). Thereafter through FY 2005/06, the airport generates a net operating surplus. After accounting for local funding requirements to complete the minimum capital improvement program, the airport generates cumulative net revenues of over $238,000 over the 10 year period.

H. SUMMARY OF FUNDING REQUIREMENTS UNDER ALTERNATIVE REVENUE AND DEVELOPMENT PROGRAMS

The cumulative 10-year surplus or deficit generated by airport operations and the capital improvements program under each of the five alternatives evaluated in this report are shown in Table 8-13. As may be noted, net revenues range from a $1.78 million deficit under the Base Case Scenario (Alternative 1) to a $238,000 surplus under the Minimum Development Program/Enhanced Revenue Scenario (Alternative 5).

I. RECOMMENDED AIRPORT LEASING POLICIES

Based upon the above lease guidelines and analysis of airport leases, it is recommended that:

TABLE 8-11
MINIMAL DEVELOPMENT PROGRAM/BASE REVENUE CASE
PROFORMA CASH FLOW & FUNDING REQUIREMENTS
FY 1995/96 - FY 2005/06

Costs and Revenues	FY 95/96 [1]	FY 96/97	FY 97/98	FY 98/99	FY 99/00	FY 00/01	FY 01/02	FY 02/03	FY 03/04	FY 04/05	FY 05/06
OPERATING REVENUES											
Aircraft Storage Fees	24,840	29,531	30,535	35,155	88,887	146,232	151,204	185,612	221,715	229,253	237,551
R&C (Ground Leases)											
Aviation	40,386	46,929	48,525	50,175	51,880	53,644	55,468	57,354	59,304	61,321	63,406
Non-Aviation	17,054	17,054	17,054	17,634	18,233	18,853	19,494	20,157	20,842	21,551	22,284
Annual State Grant	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
R&C (% Sales)	10,800	11,327	11,878	12,453	13,053	13,680	14,365	15,081	15,829	16,610	17,427
R&C (Fuel Flowage)	1,550	1,626	1,705	1,787	1,873	1,963	2,062	2,164	2,272	2,384	2,501
Business Licenses/Permits	600	600	600	600	600	600	600	600	600	600	600
Landing Fees	450	450	450	450	450	450	450	450	450	450	450
Gross Operating Revenues	105,680	117,517	120,746	128,254	184,978	245,423	253,643	291,419	331,012	342,169	354,218
OPERATING EXPENSES [2]											
Salaries & Benefits	58,320	60,303	62,353	64,473	66,665	68,932	71,276	73,699	76,205	78,796	81,475
Services & Supplies	33,171	34,299	35,465	36,671	37,918	39,207	40,540	41,918	43,343	44,817	46,341
Long-Term Debt & Interest [3]											
Existing	53,395	53,395	53,395	53,395	53,395	53,395	53,395	27,997	27,997	27,997	27,997
T-Hangar Development [4]	-	-	-	45,284	91,654	91,654	115,965	140,860	140,860	140,860	140,860
Gross Operating Expenses	144,886	147,997	151,213	199,823	249,632	253,188	281,176	284,474	288,405	292,470	296,673
NET OPERATING REVENUES	(39,206)	(30,480)	(30,467)	(71,569)	(64,654)	(7,764)	(27,532)	6,945	42,607	49,699	57,545
CAPITAL EXPENDITURES [5]			15,606	31,961	16,364	33,074					
FUNDING REQUIREMENTS											
ANNUAL	(39,206)	(30,480)	(46,073)	(103,530)	(81,018)	(40,838)	(27,532)	6,945	42,607	49,699	57,545
CUMULATIVE	(39,206)	(69,686)	(115,758)	(219,288)	(300,306)	(341,145)	(368,677)	(361,732)	(319,125)	(269,426)	(211,880)

[1] Current budget.
[2] Excludes depreciation.
[3] Includes all notes.
[4] Assumes T-Hangar development cost is financed with a State loan at 6.0% over 15 years, compounded annually.
[5] Includes only local share of county apron expansion cost associated with T-Hangar development.

SOURCE: P&D Consultants, Inc.

TABLE 8-12
MINIMAL DEVELOPMENT PROGRAM/ENHANCED REVENUE CASE
PROFORMA CASH FLOW & FUNDING REQUIREMENTS
FY 1995/96 - FY 2005/06

Costs and Revenues	FY 95/96 [1]	FY 96/97	FY 97/98	FY 98/99	FY 99/00	FY 00/01	FY 01/02	FY 02/03	FY 03/04	FY 04/05	FY 05/06
OPERATING REVENUES											
Aircraft Storage Fees	24,840	29,531	30,535	35,155	88,887	146,232	151,204	185,612	221,715	229,253	237,551
R&C (Ground Leases)											
Aviation	40,386	46,929	48,525	50,175	51,880	53,644	55,468	57,354	59,304	61,321	63,406
Non-Aviation [4]	17,054	17,054	17,054	17,634	71,812	74,254	76,778	79,389	82,088	84,879	87,765
Annual State Grant	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
R&C (% Sales)	10,800	11,327	11,878	12,453	13,053	13,680	14,365	15,081	15,829	16,610	17,427
R&C (Fuel Input) [5]	1,550	4,389	4,603	4,825	5,058	5,301	5,566	5,844	6,134	6,436	6,753
Business Licenses/Permits	600	600	600	600	600	600	600	600	600	600	600
Landing Fees	450	450	450	450	450	450	450	450	450	450	450
Gross Operating Revenues	105,680	120,281	123,644	131,292	241,741	304,161	314,432	354,330	396,120	409,550	423,951
OPERATING EXPENSES [2]											
Salaries & Benefits	58,320	60,303	62,353	64,473	66,665	68,932	71,276	73,699	76,205	78,796	81,475
Services & Supplies	33,171	34,299	35,465	36,671	37,918	39,207	40,540	41,918	43,343	44,817	46,341
Long-Term Debt & Interest [3]											
Existing	53,395	53,395	53,395	53,395	53,395	53,395	53,395	27,997	27,997	27,997	27,997
T-Hangar Development [6]	-	-	-	45,284	91,654	91,654	115,965	140,860	140,860	140,860	140,860
Gross Operating Expenses	144,886	147,997	151,213	199,823	249,632	253,188	281,176	284,474	288,405	292,470	296,673
NET OPERATING REVENUES	(39,206)	(27,716)	(27,569)	(68,531)	(7,891)	50,974	33,257	69,856	107,715	117,080	127,278
CAPITAL EXPENDITURES [7]			15,606	31,961	16,364	33,074					
FUNDING REQUIREMENTS											
ANNUAL	(39,206)	(27,716)	(43,175)	(100,492)	(24,255)	17,900	33,257	69,856	107,715	117,080	127,278
CUMULATIVE	(39,206)	(66,922)	(110,097)	(210,588)	(234,843)	(216,943)	(183,687)	(113,831)	(6,116)	110,964	238,242

[1] Current budget.
[2] Excludes depreciation.
[3] Includes all notes.
[4] Assumes market rate lease revenues from Yolo County Sportsmens Association (beginning in FY 1999/2000).
[5] Assumes imposition of fuel input fee beginning in FY 1996/97.
[6] Assumes T-Hangar development cost is financed with a State loan at 6.0% over 15 years, compounded annually.
[7] Includes only local share of county apron expansion cost associated with T-Hangar development.

SOURCE: P&D Consultants, Inc.

TABLE 8-13
SUMMARY OF 10-YEAR CASH FLOW
ALTERNATIVE AIRPORT DEVELOPMENT PROGRAMS

Alternative	Cumulative 10-Year Surplus/(Deficit)
Base Case	(1,780,578)
Enhanced Revenue Alternative	(1,327,567)
Enhanced Revenue + Financed Hangar Development Alternative	(696,385)
Minimal Development Program/ Base Revenue Case	(211,880)
Minimal Development Program/ Enhanced Revenue Alternative	238,242

SOURCE: P&D Consultants, Inc.

- Airport leasing policies adhere to the basic lease principles and contain, at a minimum, the key features discussed earlier in this section. Particular attention should be given to compliance with the FAA guidelines and the terms, conditions, and covenants in the grant agreement with the Federal government.

- The provision in the County-owned hangar rental agreement that the rates will be adjusted periodically by the Board of Supervisors (and not automatically based upon an established index) be left as is. This would allow flexibility for Airport Management to meet competition and recover costs for more hangar development. Once existing rates are adjusted to current market rates, there should be an annual rate review with subsequent adjustments made to at least be in line with changes in the CPI.

J. RECOMMENDED PROPERTY MANAGEMENT/MANAGEMENT ACTION PLAN

Based upon the above revenues/expenses, funding requirements and lease analyses, it is recommended that the following property management/action plan be pursued.

- Increase "predictable" sources of revenue to the maximum extent possible. This would involve development of hangars and long-term leases of land to FBOs and private development.

- Conduct an aggressive, focused, professional marketing effort to lease the undeveloped land designated for future FBOs and private development. One market segment would be FBOs to provide additional aviation-related services for the increased activity projected at the airport.

  Another segment would be corporations that might want to be situated on an airport. These potential tenants are likely to be drawn by the locational advantages of the airport vis-à-vis their own specialized operational and market circumstances. The marketing effort should be undertaken on a regional or even national basis and not just confined to the local area. Assuming, for instance that only the 13.5 acres for future FBOs were leased for $0.07/square foot/year, the potential income generated would approach over $41,000/year.

- Have a real estate appraisal made to determine the fair market rental value of the various airport parcels. This appraisal would provide an unbiased value for each parcel based upon locational and other factors and be used in setting new rates. Moreover, it would serve to support non-discrimination in airport land lease rate policy. This should be done especially for those parcels yielding zero or below market rents (e.g., the Yolo Sportsmen's Association parcel). For instance, rents from this parcel, if assumed at just $0.02/square foot/year, could easily provide an additional $54,000/year.

- Charge a fuel input fee, rather than a fee on just the amount of fuel sold. As noted earlier, this could, at present fuel flowage rates, provide an additional $3,000 per year (in 1995 dollars). This fee should be increased to the market average as soon as possible.

- New hangars and tiedowns should be leased for $190/month and $30/month, respectively (in constant 1995 dollars). These increases would make the rates more in line with those of competing airports.

- Finance the local share of the T-hangar development program using the CAAP loan program. Current loan rates are very favorable (approximately 6 percent, compounded annually). Anticipated hangar lease rates should more than cover the debt service, thereby providing an additional "predictable" source of revenue to the airport.

Implementation of the above recommendations could provide at least an additional $100,000/year, excluding revenue from the new hangars (which must be pledged to cover hangar revenues and reduce hangar debt). Naturally, these additional amounts would contribute toward a larger share of "predictable" revenue sources for the Yolo County Airport, and help toward making the airport operation financially self-sustaining.

SECTION 9
ENVIRONMENTAL EVALUATION

SECTION 9.
ENVIRONMENTAL EVALUATION

Before the Yolo County Airport Master Plan can be adopted and implemented by the County, it is first subject to the environmental review criteria of the California Environmental Quality Act (CEQA). Similarly, the FAA must also make an environmental finding with respect to any anticipated Federal actions associated with the implementation of the Master Plan under provisions of the National Environmental Policy Act (NEPA).

APPENDIX A
ABBREVIATIONS AND GLOSSARY

ABBREVIATIONS AND GLOSSARY OF TERMS

"A"

A-WEIGHTED SOUND LEVEL - The sound pressure level which has been filtered or weighted to reduce the influence of low and high frequency (dBA).

AC - Advisory Circular published by the Federal Aviation Administration.

ADPM - Average Day of the Peak Month

AFB - Air Force Base

AIA - Annual Instrument Approaches

AICUZ - Air Installation Compatible Use Zones define areas of compatible land use around military airfields.

AIR CARRIER AIRCRAFT - Aircraft with more than 60 seats operated by an air carrier airline.

AIR CARRIER AIRLINE - An airline certificated in accordance with FAR Part 121 or 127 to conduct scheduled services on specified routes operating aircraft with more than 60 seats. These air carriers may also provide nonscheduled or charter services as a secondary operation. Four carrier groupings have been designated for statistical and financial data aggregation and analysis.

- o. MAJORS; Air carriers with annual operating revenues greater than $1 billion.
- o. NATIONALS: Air Carriers with annual operating revenues between $100 million and $1 billion.
- o. LARGE REGIONAL: Air carriers with annual operating revenues between $10 million and $99,999,999.
- o. MEDIUM REGIONALS: All carriers with annual operating revenues less than $10 million.

AIRCRAFT MIX - The relative percentage of operations conducted at an airport by each of four classes of aircraft differentiated by gross takeoff weight and number of engines.

AIR NAVIGATIONAL FACILITY (NAVAID) - Any facility used for guiding or controlling flight in the air or during the landing or takeoff of aircraft.

AIR ROUTE SURVEILLANCE RADAR (ARSR) - Long-range radar which increases the capability of air traffic control for handling heavy enroute traffic. An ARSR site is usually located at some distance from the - ARTCC it serves. Its range is approximately 200 nautical miles. Also called ATC Center Radar.

AIR TAXI/COMMUTER AIRCRAFT - Aircraft with 60 seats or less operated by a commuter carrier, air taxi operator, or air carrier.

AIR TAXI OPERATOR - An operator certificated in accordance with FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft. Generally operates small aircraft "for hire" for specific trips.

AIRPORT AVAILABLE FOR PUBLIC USE - An airport available for use by the public with or without a prior request.

AIRPORT ENVIRONS - The area surrounding an airport that is affected by airport operations.

AIRPORT LAYOUT PLAN (ALP) - The current and planned airport development portrayal, which may be part of an airport master plan.

AIRPORT MASTER PLAN (AMP) - A long term development plan for an airport, adopted by the airport proprietor.

AIRPORT NOISE COMPATIBILITY PROGRAM - A program developed in accordance with FAR Part 150, including measures proposed or taken by the airport operator to reduce existing incompatible land use and to prevent the introduction of additional incompatible land uses within the area.

AIRPORT REFERENCE CODE (ARC) - A system for classifying an airport's capability of accommodating types of aircraft according to their approach speed and wingspan. Aircraft approach speeds are identified by letter from " A " the slowest approach speed (< 90 knots) to " E " the highest approach speed (> 160 knots). Wingspans are classified by roman numerals from" I " the shortest wingspan at (< 49 feet) to the longest wingspan" VI " at (214 feet to 262 feet). Therefore, it can be determined from an airport's ARC which classes of aircraft that can be routinely accommodated.

AIRPORT SURVEILLANCE RADAR (ASR) - Radar providing position of aircraft by azimuth and range of data without elevation data. It is designed for a range of 50 miles. Also called ATC Terminal Radar.

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

AIRSPACE - The space lying above the earth or above a certain area of land or water which is necessary to conduct aeronautical operations.

ALERT AREA - Airspace which may contain a high volume of pilot training activities or unusual type of aerial activity.

ALP - Airport Layout Plan

ALSF-1 - Approach Light System with Sequence Flasher Lights.

AGL - Above Ground Level

ALS - Approach Light System

AMBIENT SOUND LEVELS - Ambient noise is the total noise associated with a given environment and usually comprises sounds from many different sources both near and far. Ambient noise is often defined in terms of the following statistical indicators:

L10 - the sound pressure level exceeded 10 percent of the time
L50 - the sound pressure level exceeded 50 percent of the time
L90 - the sound pressure level exceeded 90 percent of the time

ANCLUC - Airport Noise and Compatible Land Use Control plan; an FAA sponsored land use compatibility planning program preceding Part 150 Airport Noise Compatibility Program.

APPROACH CONTROL SERVICE - Air traffic control service provided by a terminal area traffic control facility for arriving and departing IFR aircraft and, on occasion, VFR aircraft.

APPROACH FIX - The point from or over which final approach (IFR) to an airport is executed.

APPROACH LIGHTING SYSTEM - Approach lighting systems (ALS) are configurations of lights positioned symmetrically along the extended runway threshold and extend towards the approach. An ALS augments the electronic navigational aids.

APPROACH SLOPE - Imaginary areas extending out and away from the approach ends of runways which are to be kept clear of obstructions.

APPROACH SURFACE - An element of the airport imaginary surfaces, longitudinally centered on the extended runway centerline, extending upward and outward from the end of the primary surface at a designated slope.

AREA NAVIGATION(RNAV) - A method of navigation that permits aircraft operations on any desired course within the coverage or stationed-reference navigation systems or within the limits of self-contained system capability.

ARFF - Airport Rescue and Fire Fighting.

ARTS-III - Automated Radar Terminal Service - Phase III. A terminal facility in the air traffic control system using air ground communications and radar intelligence to detect and display pertinent data such as flight identification, altitude and position of aircraft operating in the terminal area.

ASDE - Airport Surface Detection Equipment

ASV - Annual Service Volume - a reasonable estimate of the airfield's annual capacity.

ATCT - Airport Traffic Control Tower

ATC - Air Traffic Control

ATIS - Automatic Terminal Information Service

AVERAGE DAY PEAK MONTH (ADPM) ACTIVITY - Activity (passengers or aircraft operations) in the average day of the peak month of the activity. Average day activity is obtained by dividing the peak month activity by the number of days in the month. ADPM activity is used for planning airport requirements.

AVIGATION AND HAZARD EASEMENT - An easement which provides right of flight at any altitude above the approach surface, prevents any obstruction above the approach surface, provides a right to cause noise vibrations, prohibits the creation of electrical interferences, and grants right-of-way entry to remove trees or structures above the approach surface.

"B"

BASED AIRCRAFT - An aircraft permanently stationed at the airport, usually by some form of agreement between the aircraft owner and airport management.

BUSINESS JET - Any of a type of turbine powered aircraft carrying six or more passengers and weighing less than approximately 70,000 pounds gross takeoff weight.

"C"

CARGO - Originating and/or terminating.

CAT I - Category I Instrument Landing System. (Minimums: decision height of 200 feet; Runway visual range 1,800 feet).

CAT II - Category II Instrument Landing System. (Minimums: decision height of 100 feet; Runway visual range 1,200 feet).

CAT III - Category III Instrument Landing System. (Minimums: no decision height; Runway visual range of from 0 to 700 feet depending on type of CAT III facility).

CENTER'S AREA - The specified airspace within which an air route traffic control center provides air traffic control and advisory service.

CFR - Crash, Fire and Rescue (now called Airport Rescue and Fire Fighting (ARFF)

CIRCLING APPROACH - A maneuver initiated by the pilot to align the aircraft with a runway for landing when a straight-in instrument approach is not possible. This maneuver requires ATC clearance and that the pilot establish visual reference to the airport.

CL - Centerline

CLEARWAY - A defined rectangular area beyond the end of a runway cleared or suitable for use in lieu of runway to satisfy takeoff distance requirements.

CNEL - Community Noise Equivalent Level - a noise metric used in California to describe the overall noise environment of a given area from a variety of sources.

COMMERCIAL SERVICE AIRPORT - A public airport which received scheduled passenger service and enplanes annually 2,500 or more passengers.

COMMUTER CARRIER - An airline certificated in accordance with FAR Part 135 or 121 that operates aircraft with a maximum of 60 seats, and that provides at least five scheduled round trips per week between two or more points, or that carries mail.

CONICAL SURFACE - An imaginary surface extending upward and outward from the periphery of the horizontal surface at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

CONNECTION - A passenger who boards an aircraft directly after deplaning from another flight. On-line single carrier connections involve flights of the same carrier, while interline or off-line connections involve flights of two different carriers. This term can also be applied to freight shipments.

CONTINENTAL CONTROL AREA - This includes the airspace at and above 14,500 feet MSL of the 48 contiguous states, the District of Columbia, and Alaska, excluding the Alaskan peninsula west of longitude 160 degrees west. It does not include the airspace less than 1,500 feet above the surface of the earth nor most prohibited or restricted areas.

CONTROL AREAS - These consist of the airspace designated as VOR Federal Airways, additional Control Area Extensions but do not include the Continental Control Area. Control zones that do not underlie the continental control area have no upper limit. A control zone may include one or more airports and is normally a circular area with a radius of 5 statute miles and any extensions necessary to include instrument departure and arrival paths.

CONTROLLED AREA - Airspace within which some or all aircraft may be subject to air traffic control.

CONTROL TOWER - A central operations facility in the terminal air traffic control system consisting of a tower cab structure (including an associated IFR room if radar equipped) using air/ground communications and/or radar, visual signaling and other devices to provide safe and expeditious movement of terminal air traffic.

CONTROL ZONES - These are areas of controlled airspace which extend upward from the surface and terminate at the base of the continental control area. Control zones that do not underlie the continental control area have no upper limit. A control zone may include one or more airports and is normally a circular area with a radius of 5 statute miles of any extensions necessary to include instrument departure and arrival paths.

CONTROLLED AIRSPACE - Airspace designated as continental control area, control area, control zone or transition area within which some or all aircraft may be subject to air traffic control.

CROSSWIND RUNWAY - A runway aligned at an angle to the prevailing wind which allows use of an airport when crosswind conditions on the primary runway would otherwise restrict use.

CURFEW - A restriction placed upon all or certain classes of aircraft by time of day, for purposes of reducing or controlling airport noise.

"D"

DECISION HEIGHT (DH) - With respect to the operation of aircraft, this means the height at which a decision must be made, using an ILS or PAR instrument approach, to either continue the approach or to execute a missed approach.

DECLARED DISTANCES - The distances the airport owner declares available and suitable for satisfying the airplane's takeoff urn, takeoff distance, accelerate-stop distance, and landing distance requirements. The distances are:

- *Takeoff run available (TORA)* - the runway length declared available and suitable for the ground run of an airplane taking off.
- *Takeoff distance available (TODA)* - the TORA plus the length of any remaining runway and/or clearway beyond the far end of the TORA.
- *Accelerate-stop distance available (ASDA)* - the runway plus stopway length declared available and suitable for the acceleration and deceleration of an airplane aborting a takeoff; and
- *Landing distance available (LDA)* - the runway length declared available and suitable for a landing airplane.

DEMAND - The actual number of persons, aircraft or vehicles currently using a facility if that facility is operating at or below capacity or the number of persons, aircraft or vehicles who want to use the facility when the facility is operating above capacity.

DEPLANEMENT - Any passenger getting off an arriving aircraft at an airport. Can be both a terminating and connecting passenger. Also applies to freight shipments.

DISPLACED THRESHOLD - A threshold that is located at a point on the runway other than the designated beginning of the runway.

DISTANCE MEASURING EQUIPMENT (DME) - An electronic installation established with either a VOR or ILS to provide distance information from the facility to pilots by reception of electronic signals. It measures, in nautical miles, the distance of an aircraft from a NAVAID.

DNL (Ldn) - Ldn is based upon the Leq with the aircraft operations occurring during the period 10:00 p.m. to 7:00 a.m. weighted by a 10 dB penalty.

"E"

EA (Environmental Assessment) - A document prepared under the National Environmental Policy Act of 1969 to determine whether potential impacts appear to be significant. The completion of an EA often precedes the decision to prepare and EIS.

ENPLANEMENT - Any passenger boarding a departing aircraft at an airport. Can be both a local origin and a connecting passenger. Applies also to freight shipments.

ENROUTE - The route of flight from point of departure to point of destination, including intermediate stops (excludes local operations).

ENROUTE AIRSPACE - Controlled airspace above and/or adjacent to terminal airspace.

ENVIRONMENTAL IMPACT STATEMENT (EIS) - A document prepared under the National Environmental Policy Act of 1969 to describe the social, economic, and physical impacts of proposed federal projects or projects requiring federal money or approval.

EQUIVALENT SOUND LEVEL (LEQ) - The steady A-weighted sound level over a specified period that has the same acoustic energy as the fluctuating noise during that period.

ERG - Effective Runway Gradient

"F"

F&E - Facilities and Equipment Programming - FAA

FAR Part 36 - A regulation establishing noise certification standards for aircraft.

FAR Part 77 - Establishes standards for determining obstructions in navigable airspace, sets forth requirements for notice of proposed construction or alteration and provides for aeronautical studies of obstructions to air navigation.

FAR Part 150 (Federal Aviation Regulation Part 150, 14 CFR 150) - The regulation describing the requirements and procedures for conducting a voluntary aircraft noise and land use compatibility study.

FEDERAL AIRWAYS - See Low Altitude Airways.

FEDERAL AVIATION ADMINISTRATION (FAA) - The federal agency charged with regulating air commerce to promote its safety and development, encouraging and developing civil aviation, air traffic control, and air navigation and promoting the development of a national system of airports.

FEDERAL AVIATION REGULATIONS (FAR) - Regulations issued by the FAA to regulate air commerce; issued as separate "Parts," e.g., Part 77

FINAL APPROACH IFR - The flight plan of landing aircraft in the direction of landing along the extended runway centerline from the base leg to the runway.

FIXED BASE OPERATOR (FBO) - An airport service operation, normally consisting of fuel sales, aircraft rentals, charter aircraft sales and maintenance with a fixed base of operation at the airport.

FLEET MIX - The proportion of aircraft types or models expected to operate at an airport.

FLIGHT SERVICE STATION (FSS) - A facility operated by the FAA to provide flight assistance service.

"G"

GENERAL AVIATION (GA) - All segments of aviation except air carrier and military. Included are corporate, industrial, agricultural, public and emergency services, business, charter, personal and sport flying.

GLIDE SCOPE (GS) - The vertical guidance component of an Instrument Landing System (ILS).

"H"

HIGH ALTITUDE AIRWAYS - See Jet Routes.

HIRL - High Intensity Runway Lighting

HOLDING - A predetermined maneuver which keeps an aircraft within a specified airspace while awaiting further clearance.

HORIZONTAL SURFACE - An imaginary surface constituting a horizontal plane 150 feet above the airport elevation.

"I"

IMAGINARY SURFACE - An area established in relation to the airport and to each runway consistent with FAR Part 77 in which any object extending above these imaginary surfaces is, by definition, an obstruction.

INSTRUMENT APPROACH - 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.

INSTRUMENT FLIGHT RULES (IFR) - FAR rules that govern the procedures for conducting instrument flight (FAR Part 91).

INSTRUMENT LANDING SYSTEM (ILS) - A precision landing aid consisting of localizer (azimuth guidance), glide slope (vertical guidance), outer marker (final approach fix) and approach light system.

INSTRUMENT OPERATION - A landing or takeoff conducted while operating on an instrument flight plan.

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 established.

INTEGRATED NOISE MODEL (INM) - A computer-based airport noise exposure modelling program developed for the FAA.

ITINERANT OPERATIONS - All aircraft arrivals and departures other than local operations.

INTERNATIONAL OPERATIONS - Aircraft operations performed by air carriers engaged in scheduled international service.

"J"

JET ROUTES - A route designed to serve aircraft operating from 18,000 feet MSL up to and including flight level 450.

"L"

LAT - Latitude

LDA - Localizer Type Directional Aid

LDN - Day-Night Average Sound Level. The 24-hour average sound level, in decibels, from midnight to midnight, obtained after the addition of ten decibels to sound levels for periods between 10:00 p.m. and 7:00 a.m.

LENGTH OF HAUL - The non-stop airline route distance from a particular airport.

LEQ - Leq is the equivalent continuous sound level defined as the steady state sound pressure level dB(A) which, over a given period of time, has the same total energy as the actual fluctuating noise.

LEVEL OF SERVICE (LOS) - A standardized index of the relative service provided by street or intersection, ranging from A (extremely farmable) to E (oversaturation).

LIRL - Low Intensity Runway Lighting

LOAD FACTOR - Ratio of the number of passenger miles to the available seat miles flown by an airline representing the proportion of aircraft seating capacity that is actually sold and utilized. Load factors are also referred to in air cargo and can be determined by weight or volume.

LOC - Localizer (part of a ILS)

LOCAL OPERATION - Operations performed by aircraft which: (a) operate in the local traffic pattern or within the sight of the tower; (b) are known to be departing for, or arriving from, flight in local practice areas located within a 20-mile radius of the control tower, or (c) execute simulated instrument approaches or low passes at the airport.

LOM - Compass locator at an outer marker (part of an ILS). Also call COMLO.

LONG - Longitude

LOW ALTITUDE AIRWAYS - Air routes below 18,000 feet MSL. They are referred to as Federal Airways.

LRR - Long-Range Radar

"M"

MALS - Medium Intensity Approach Light System

MALSF - Medium Intensity Approach Light System with sequence flashing lights.

MALSR - MALS with Runway Alignment Indicator Lights (RAIL)

MARKER BEACON - An electronic navigation facility which transmits a fan or boneshaped radiation pattern. When received by compatible airborne equipment they indicate to the pilot that he is passing over the

facility. Beacons are used to advise pilots of their position during an ILS approach. Marker beacons are of three types: Outer Marker, Middle Marker, and Inner Marker.

MASTER PLAN - Long-range plan of airport development requirements.

MGW - Maximum Gross Weight

MILITARY OPERATION - An operation by military aircraft.

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

MIRL - Medium Intensity Runway Lighting

MISSED APPROACH - A prescribed procedure to be followed by aircraft that cannot complete an attempted landing at an airport.

MITL - Medium Intensity Taxiway Lighting

MLS - Microwave Landing System

MM - Middle Marker (part of an ILS)

MOA - Military Operations Area

MODE - A particular form or method of travel such as walk, auto, carpool, bus, rapid transit, etc.

MOVEMENT - Synonymous with the term operation, i.e., a takeoff or a landing.

MSL - Mean Sea Level

"N"

NARROWBODY AIRCRAFT - A commercial passenger jet having a single aisle and a maximum of three seats on each side of the aisle. Narrowbody aircraft include the B727, B737, B757, DC9, MD80, MD90 and A320.

NAS - NATIONAL AIRSPACE SYSTEM - The common system or air navigation and air traffic encompassing communications facilities, air navigation facilities, airways, controlled airspace, special use

airspace and flight procedures authorized by Federal Aviation Regulations for domestic and international aviation.

NAVAID - Any facility used for guiding or controlling flight in the air or during the landing or takeoff of aircraft.

NDB - NON-DIRECTIONAL BEACON - An electronic ground station transmitting in all directions in the L/MF frequency spectrum; provides azimuth guidance to aircraft equipped with direction finder receivers. These facilities are often established with ILS outer markers to provide transition guidance to the ILS system.

NEPA - National Environmental Policy Act

NM - Nautical Mile

NOISE ABATEMENT - A procedure for the operation of aircraft at an airport which minimizes the impact of noise on the environs of the airport.

NOISE CONTOUR - A noise impact boundary line connecting points on a map where the level of sound is the same.

NOISE EXPOSURE MAP (NEM) - A scaled, geographic depiction of an airport, its noise contours and surrounding area, as described in FAR Part 150.

NOISE LEVEL REDUCTION (NLR) - The amount of noise level reduction achieved through incorporation of noise attenuation (between outdoor and indoor levels) in the design and construction of a structure.

NON-PRECISION APPROACH - A standard instrument approach procedure in which no electronic glide slope is provided.

NPI - Non-Precision Instrument Runway

"O"

OAG - Official Airline Guide

OBSTRUCTION - Any structure, growth, or other object, including a mobile object, that exceeds a limiting height established by federal regulations or by a hazard zoning regulation.

OM - Outer Marker (part of an ILS)

OPERATING SPEED - The maximum average speed for a given set of roadway and traffic conditions.

OPERATION - An aircraft arrival at or departure from an airport.

ORIGIN AND DESTINATION PASSENGERS (O&D) - Those passengers--whether visitors or residents--whose trips begin or end in the region.

OUTER FIX - A point in the destination terminal area from which aircraft are cleared to the approach fix or final approach course.

"P"

PAPI - Precision Approach Path Indicator

PAR - Precision Approach Radar

PEAK HOUR ACTIVITY - Activity (passengers or aircraft operations) in the busiest hour of the average day peak month (ADPM).

PI - Precision Instrument Runway marking.

POSITIVE CONTROL AREA - Airspace wherein aircraft are required to be operated under Instrument Flight Rules.

PRECISION APPROACH - A standard instrument approach procedure in which an electronic glideslope/glidepath is provided; eg., ILS/MLS and PAR.

PRIMARY COMMERCIAL SERVICE AIRPORT - A commercial service airport which enplanes .01 percent or more of the total annual U.S. enplanements.

PRIMARY RUNWAY - The runway on which the majority of operations take place. On large, busy airports, there may be two or more parallel primary runways.

PRIMARY SURFACE - An area longitudinally centered on a runway with a width ranging from 250 to 1,000 feet and extending 200 feet beyond the end of a paved runway.

PROHIBITED AREA - Airspace of defined dimensions identified by an area on the surface of the earth within flight is prohibited.

"Q"

QUEUE - A line of pedestrians or vehicles waiting to be served.

"R"

RADAR SEPARATION - Radar spacing of aircraft in accordance with established minima.

RAIL - Runway Alignment Indicator Lights

RCAG - Remote Center Air/Ground Communications

REIL - Runway End Identification Lights

RELIEVER AIRPORT - An airport which, when certain criteria are met, relieves the aeronautical demand on a high density air carrier airport.

RESTRICTED AREAS - Airspace of defined dimensions identified by an area on the surface of the earth within which the flight of aircraft, while not wholly prohibited, is subject to restrictions.

RNAV - See Area Navigation.

ROTATING BEACON - A visual NAVAID displaying flashes of white and/or colored light used to indicate location of an airport.

RPZ - Runway Protection Zone (inner portion of runway approach zone; formerly called Clear Zone)

RUNWAY SAFETY AREA - An area symmetrical about the runway centerline and extending beyond the ends of the runway which shall be free of obstacles as specified.

RVR - Runway Visual Range

RVV - Runway Visibility Value

"S"

SALS - Short Approach Light System

SDF - Simplified Directional Facility landing aid providing final approach course.

SEGMENTED CIRCLE - An airport aid identifying the traffic pattern direction.

SEPARATION MINIMA - The minimum longitudinal, lateral, or vertical distances by which aircraft are spaced through the application of air traffic control procedures.

SOUND EXPOSURE LEVEL - That constant sound level which has the same amount of energy in one second as the original noise event.

SSALF - Simplified Short Approach Light System with Sequence Flashing lights.

SSALS - Simplified Short Approach Light System.

SSALR - Simplified Short Approach Light System with Runway Alignment Indicator Lights (RAIL)

STOPWAY - A defined rectangular surface beyond the end of a runway prepared or suitable for use in lieu of runway to support an airplane, without causing structural damage to the airplane, during an aborted takeoff.

STRAIGHT-IN APPROACH - A descent in an approved procedure in which the final approach course alignment and descent gradient permits authorization of straight-in landing minimums.

STOL - Short Takeoff and Landing

STOVL - Short Takeoff Vertical Landing

SYSTEM PLAN - A representative of the aviation facilities required to meet the immediate and future air transportation needs and to achieve the overall goals.

"T"

TACAN - Tactical Air Navigation

TDZ - Touchdown Zone

TERMINAL AIRSPACE - The controlled airspace normally associated with aircraft departure and arrival patterns to/from airports within a terminal system and between adjacent terminal systems in which tower enroute air traffic control service is provided.

TERMINAL CONTROL AREA (TCA) - This consists of controlled airspace extending upward from the surface or higher to specified altitudes within which all aircraft are subject to positive air traffic control procedures.

TERPS - Terminal Instrument Procedures

T-HANGAR - A T-shaped aircraft hangar which provides shelter for a single airplane.

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

TIME ABOVE - Time above indicates the time in minutes that a given dB(A) levels is exceeded during a 24-hour period.

TOUCH-AND-GO OPERATION - An operation in which the aircraft lands and begins takeoff roll without stopping.

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

TRANSIENT OPERATIONS - See Itinerant Operations.

TRANSITION SURFACE - An element of the imaginary surfaces extending outward at right angles to the runway centerline and from the sides of the primary and approach surfaces to where they intersect the horizontal and conical surfaces.

TRANSITIONAL AIRSPACE (TRANSITION AREA) - Areas designated to contain IFR operations in controlled airspace during portions of the terminal operations and while transitioning between the terminal and enroute environment.

TVOR - Terminal Very High Frequency Omnirange Station

"U"

UHF - Ultra High Frequency

UNCONTROLLED AIRSPACE - That portion of the airspace that has not been designated as continental control area, control area, control zone, terminal control area or transition area and within which ATC has neither the authority nor the responsibility for exercising control over air traffic.

UNICOM - Radio communications station which provides pilots with pertinent airport information (winds, weather, etc.) at specific airports.

UTILITY RUNWAY - A runway intended to be used by propeller driven aircraft of 12,500 pounds maximum gross weight or less.

"V"

VASI - Visual Approach Slope Indicator providing visual glide path.

VASI-2 - Two Box Visual Approach Slope Indicator

VASI-4 - Four Box Visual Approach Slope Indicator

VECTOR - A heading issued to an aircraft to provide navigational guidance by radar.

VFR - Visual Flight Rules that govern flight procedures in good weather.

VFR AIRCRAFT - An aircraft conducting flight in accordance with Visual Flight Rules.

VHF - Very High Frequency

VISUAL APPROACH RUNWAY - A runway intended for visual approaches only.

VOR - Very High Frequency Omnirange Station. A ground-based radio (electronic) navigation aid transmitting radials in all directions in the VHF frequency spectrum; provides azimuth guidance to pilots by reception of electronic signals.

VORTAC - Co-located VOR and TACAN.

V/STOL - Vertical/Short Takeoff and Landing

VTOL - Vertical Takeoff and Landing (includes, but is not limited to, helicopters).

"W"

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

WIND CONE (WIND SOCK) - Conical wind directional indicator.

WIND TEE - A visual device used to advise pilots about wind direction at an airport.

APPENDIX B
SAMPLE SURVEY FORM

GENERAL AVIATION AIRPORT SURVEY

Name of Airport _____ Date: _____

Location _____ Survey by: _____

Airport Contact: Name: _____
Title _____
-Telephone # _____

Would you like a copy of the survey results? YES NO

I. Airport Activity

Year	Annual Operations	Based Aircraft: Single Engine	Multi Engine	Jet	Total
1995					
1994					
1993					
1992					
1991					

II. Fixed Based Operations

Rents/Fuel		Average Rate		Annual Fees Paid to Airport
FBO Ground Rental			($/sq ft/yr)	$
FBO Hanger Rental			($/sq ft/yr)	$
FBO Tie-Down	Monthly		($/acft/mo)	$
	Overnight		($/acft/night)	$
FBO Fuel Flowage			($/gal sold)	$
FBO Fuel Input			($/gal delivered)	$

FBO Sales Minimum/% of Sales Fees

Type of Goods/ Services	Minimum ($)	% Sales Over Minimum	% of Total Sales

Annual Sales Fee Revenues $ _____

Escalation

CPI	Other (specify)	How Often Adjusted

GENERAL AVIATION AIRPORT SURVEY

III. Airport Owned Operations

Hangars	Full Ts	1/2 Ts	Single Engine	Twin Engine
Number of Airport Hangars				
Average Airport Hanger Rental Rate ($/mo)				
Annual Airport Hangar Revenue ($)				
Airport Hangar Waiting List (# Hangars)				

Other		Average Rate		Annual Fees Paid to Airport
Airport Tie-Down	Monthly		($/acft/mo)	$
	Overnight		($/acft/night)	$
Airport Terminal Building				
	Counter space		($/sq ft/yr)	$
	Office space		($/sq ft/yr)	$
	Other (specify)		($/sq ft/yr)	$
Landing Fees for General Aviation Revenue Flights			($/1000 lbs GLW)	$

IV. Other Airport Rents Revenues

Other Rents

Activity	Land Area (sq ft)	Land Rent ($/sq ft/yr)	Aprt Bldg Area (sq ft)	Bldg Rent ($/sq ft/yr)	When Started (year)

Other Activity

Activity	Basis of Charge ($/activity)	Annual Revenue ($/yr)	Lease or Permit Involved? (specify)	When Started (year)