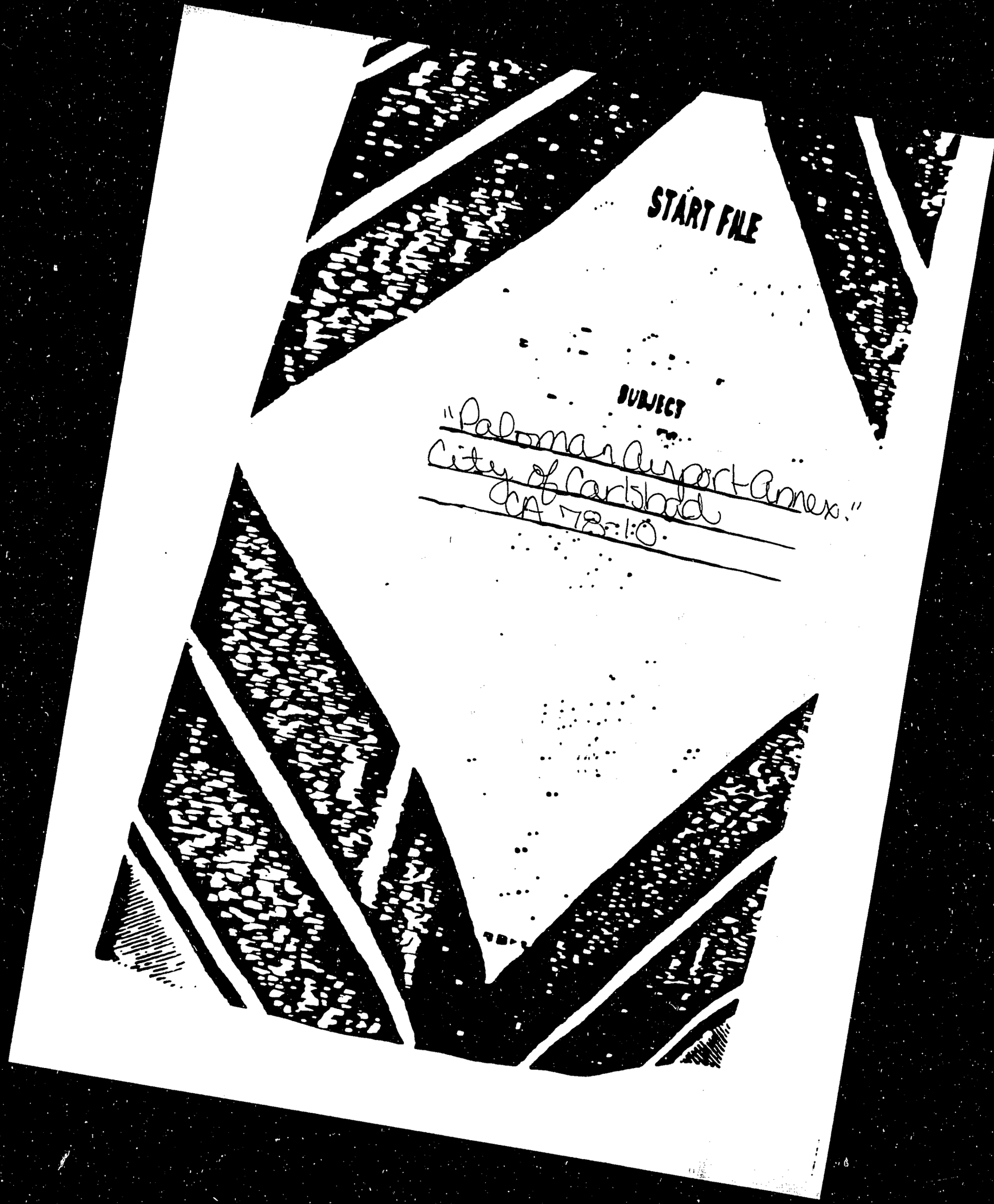
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CA 78-10

CORRECTION

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COUNTY OF SAN DIEGO

Department of General Services

Central Records Service

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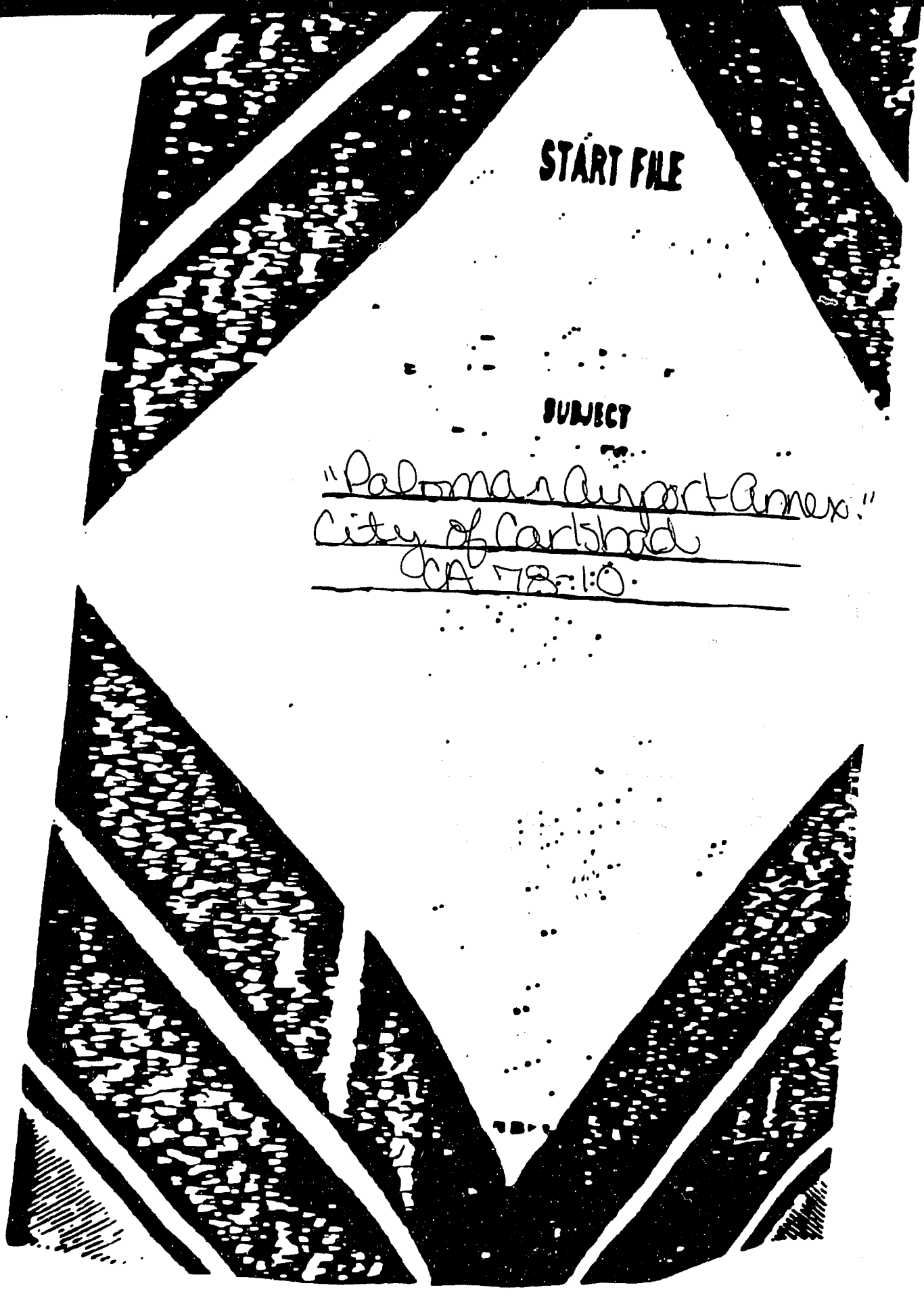
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Attachment 'B'

PALOMAR AIRPORT MASTER PLAN

Prepared for

SAN DIEGO COUNTY

Contract No. 7277-1300-E

January 1, 1975

By

WILLIAM L. PEREIRA ASSOCIATES

Corona del Mar, California 92625

This report was financed in part through an Airport Master Planning Grant from the Department of Transportation, Federal Aviation Administration.

ACKNOWLEDGEMENTS

William L. Pereira Associates wish to acknowledge the participation and cooperation of the following members of the San Diego County, Department of Public Works staff:

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This report represents the result of a Master Plan Study for Palomar Airport conducted by William L. Pereira Associates in compliance with Contract No. 7277-1300-E for the County of San Diego, Public Works Agency, Department of General Services. The study consisted of work included in Planning Grant Project No. 73-1A-06-0036-01, which was accomplished

in accordance with a Grant Agreement between the County of San Diego and the United States under the Airport and Airway Development Act of 1970, and the regulations of the Federal Aviation Administration, Contract No. DOT-FA73WE-2191.

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CORRECTION

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ASSIGNMENT AND SCOPE OF WORK

ASSIGNMENT AND SCOPE OF WORK

The Department of General Services, Public Works Agency of the County of San Diego awarded a contract, dated April 10, 1973 to William L. Pereira Associates to develop a Master Plan for Palomar Airport in accordance with an FAA Master Planning Grant.

The Department received its authorization from the Board of Supervisors by resolution, dated February 27, 1973. The resolution was prepared in response to recommendations by the Public Works Administrator.

The "recommendations are proposed to initiate the long awaited and much needed airport master planning study which will help to give direction to County plans and coordinate them with those of the surrounding communities."

Within this context, the scope of work was to include the following:

- Accumulate, analyze and assess data at regional and local levels which would influence future development of the Palomar property. Parameters to be analyzed included general aviation,

demographic trends, urban structure, transportation networks, present and proposed land uses, existing airport facilities, airspace, navaids, demand forecasts, aircraft mix, aircraft operations, and other data necessary to evaluate planning and development concepts.

- Selection of a site for a second runway would result from evaluation of airspace requirements, environmental factors, community growth, airport access, availability of utilities, land costs and engineering factors which affect the site development costs. Consideration of reconstruction of the existing runway to alleviate the changing gradient and vertical curves which resulted from original terrain constraints.
- Development of an Airport Layout Plan, Land Use Plan, Terminal Area Plan and Airport Access Plan. All elements of the plans would be examined to determine that they accurately

reflect FAA standards, etc. Adjustments would be made where necessary to satisfy comprehensive planning objectives.

- Perform a multidisciplinary study to determine the environmental and economic feasibility of the proposed development program.
- Examine and provide development schedules, cost estimates, feasibility studies, and methods of financing for the programs recommended.

EXECUTIVE SUMMARY

The rapid growth in the number of general aviation aircraft during the past decade is a direct manifestation of changing technology, culture and lifestyles. If the general aviation system is to remain effective and still be in harmony with man and his environment, future systems must respond in unique ways to opportunities. Palomar is particularly susceptible to this type of planning because of its location in rapidly growing North San Diego County.

The mission of Palomar is to provide a wide range of general aviation services in the North County area. This mission must provide compatible and attractive aviation facilities which respond to community needs and which generate the necessary revenues to operate and develop the airport.

Unrestricted demand projections indicate that 500,000 annual operations are anticipated to occur at Palomar by 1990. This figure suggests a 250 percent increase in aircraft operations during the study period. If these projections are correct, a new (east-west) runway should be built to satisfy demand.

After thorough analysis of seven alternatives for a second runway, it appeared that Alternative 5 best answered the future needs for Palomar Airport. It was discovered that the necessary land to accomplish construction in this alternative configuration was not available. The project, therefore, was stopped until land acquisition possibilities were resolved. The available land became the "fix" as to what could be done and the County directed a solution which is shown as Alternative 7 (the selected configuration).

A layout plan was then developed based on the above property constraint which meets FAA criteria and which maximizes the airport's capacity in the chosen configuration. It proposes the following improvements -

Runways

- Extend runway 6R/24L to a landing length of 5,100 feet and fill low area to effective gradient of 0.18% to meet FAA basic transport runway criteria.
- Construct parallel runway 6L/24R to a landing length of 3,600 feet, to meet general utility runway criteria.

Taxiways

- Construct a parallel taxiway north of runway 6L/24R.

- Extend the south parallel taxiway to connect the extended runway.
- Construct taxiways connecting both runways.

Lighting

- Install MIRL system on 6L/24R, associated taxiways, and taxiway connectors.
- Install centerline lights on reconstructed 6R/24L.

Approach Aids

- Install a precision instrument approach system and MALSR approach light system on runway 24L (now underway).
- Install REIL end identifier system on runway 24R.
- Install VASI on runway 24R.

Support Facilities

- Provide airport fire and crash facilities.
- Provide additional FBO leasehold areas.

Land

- Acquire necessary clear zones.
- Acquire land located north and west of the existing airport boundary to provide for construction

of runway 6L/24R and to provide buffering from the community with architecturally controlled FBOs.

- Acquire an avigation easement on the hilltop land approximately one mile east of the airport to protect the instrument approach surface to runway 24L.

Site Development

- Provide required grading, drainage, utilities, and service roads.

Roads

- Provide an airport perimeter road in conjunction with service roads to the FBO space.
- Provide additional entrance roads north and south.
- Relocate the existing service road to allow unobstructed taxiway access to FBO space.

The Land Use Plan defines the aviation oriented activities which include fixed base operators (FBO), itinerant parking, control tower, helicopter pads, and airport administration facilities. These activities are located adjacent to the taxiways to insure convenient access to all runways. The non-aviation oriented activity is located adjacent to the airport entrance.

Revenues and costs have been estimated to determine cash flow and financial requirements. The development cost requirement is approximately $2,600,000 at its peak annual position in 1974-1975 and it is recommended that since this expenditure has already been funded any future financing should be obtained from the general fund and from airport revenue.

OVERVIEW

Prior to formulating conclusions and recommendations for the development of a Master Plan for the Palomar property, general aviation trends and lifestyles were examined to determine the proper planning context. With these trends in mind, information was collected to discover the interactions inherent in the regional and local urban structure. The significant interactions which will influence the development of the Palomar property were identified and their impacts examined. The information was utilized to define the mission of Palomar Airport within a regional and local context and within the property constraints imposed by neighboring development.

General Aviation

Increases in discretionary income and leisure time weighed against lower air fares along with more speed and comfort in air travel, have resulted in phenomenal aviation growth. This growth is generally associated with airline traffic which increased at an average annual rate of 21 percent from 1930 to 1970; however, General Aviation has an even more remarkable record.

The Department of Transportation's Air Traffic Control Advisory Committee noted in 1970 that 84 percent of all aircraft operating in the U.S. in 1968 were general aviation aircraft. This figure is expected to increase to 95 percent by 1995. FAA projections released in December 1974 indicate that the general aviation fleet will increase from 153,000 in 1974 to 275,000 in 1986. Production which was up to 14,700 units in 1974, is expected to reach 15,000 in 1975 and then level off at about 13,000 per year. The report notes that the continued strength of light aircraft sales during a time of unfavorable economic conditions may be due to a shift in short-haul transportation costs in favor of General Aviation.

For the most part, the development of Commercial and General Aviation aircraft in the past has been largely dependent upon military research and technology. The growing importance of civil aircraft in recent years has encouraged development, however, which is more responsive to civil needs. Greater effort must be expended on the problems confronting commercial, business, and private aviation in the future. However, it is anticipated that

technology will respond in a variety of ways which will insure the continued growth of aviation because of its importance as a means of transportation. (Ref. 7)

Noise

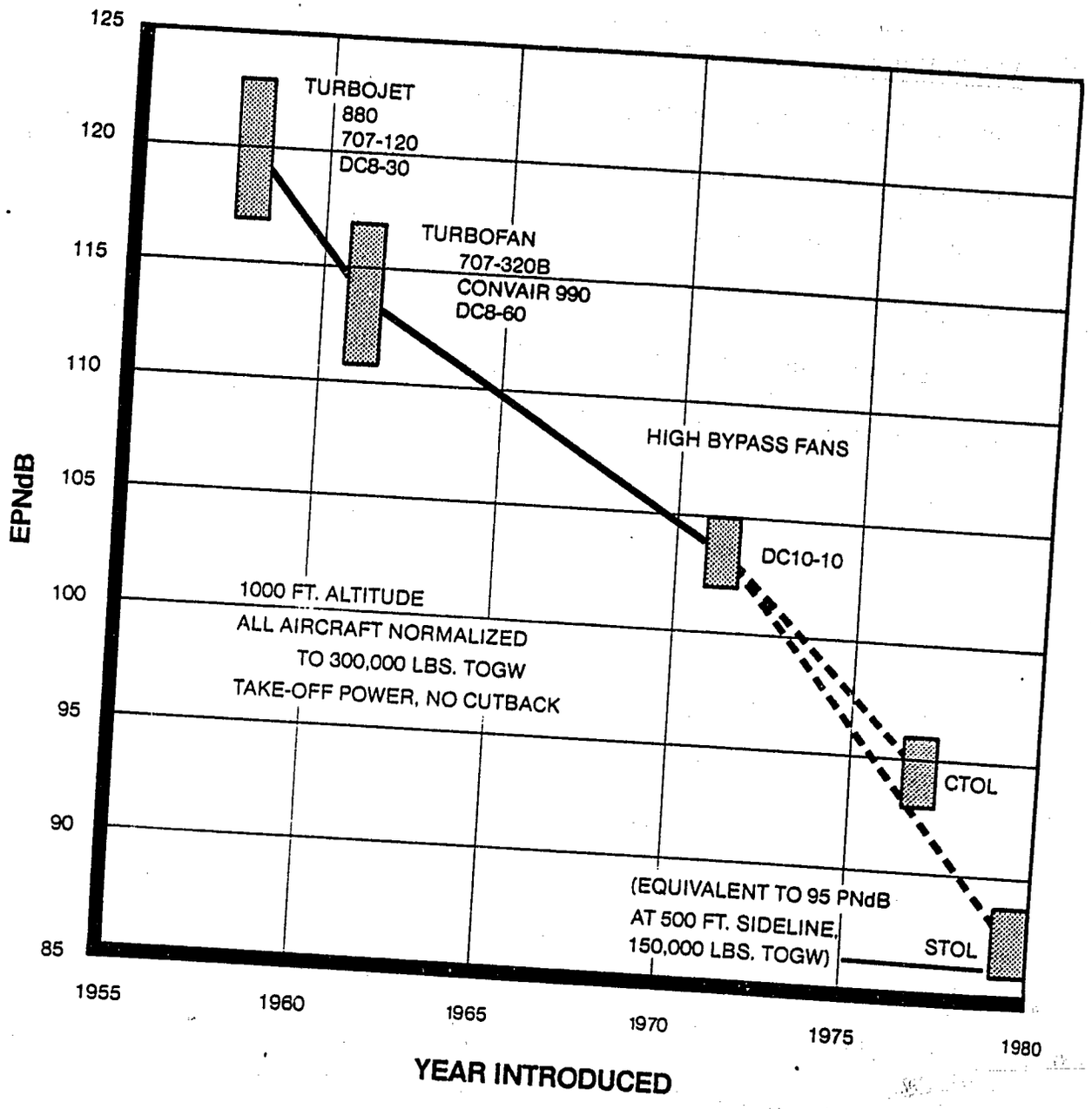
Significant changes are already taking place. A summation of the proceedings of the June 1971 AIAA/FAA conference on "Air Transportation and Society" states that the most immediate environmental problem facing air transportation is noise. The aviation industry, aware of the problem, has taken this requirement into consideration in the development of new aircraft. As a result, a significant reduction of jet aircraft noise has already been achieved and experimental research projects demonstrate that further noise reduction is anticipated (illustrated in Figure I. 1).

The AIAA/FAA conference summary states that CTOL "quiet engine" aircraft with a noise level of 95 EPNdB will be operational by 1977 and STOL "quiet engine" aircraft with a noise level of 87 EPNdB will be operational by 1980. These levels are considered to be equivalent to the background noise emitted from other

sources at airport locations. If these projections are correct, "quiet aircraft" will be in operation after 1980. It is essential that research and development of "quiet engine" aircraft be continued to achieve this goal. The present legislative goals of FAA appear to bear out these projections.

The technology to develop quieter jet air carrier aircraft has been applied to general aviation aircraft such as the Cessna Citation, the re-engined Lockheed JetStar, and the Learjet 35. It is expected that the research in jet noise will provide knowledge of ways to improve piston engine noise also. These developments are important in the sense that noise from business jets and a large increase in piston engine operations will constitute the major impact on land located in the immediate vicinity of Palomar. (Ref. Appendix D)

In addition to quieting the engine, other alternatives are now being considered to reduce noise impact on the community by: (1) steeper departure and approach paths, (2) establishment of less sensitive approach routes, (3) soundproofing of building structures, and (4) the establishment of compatible land uses in the immediate airport vicinity.



SOURCE: AIAA/FAA, AIR TRANSPORTATION & SOCIETY

Aircraft Noise Trend - Jets

Figure I.1

Air Pollution

Less than one percent of all pollutants in the atmosphere are directly attributed to aircraft emissions. However, pollution attributed to aircraft is greater at airports because of the large concentrations of aircraft and the fact that idle and taxi operations produce far more pollutants than cruise operations. The AIAA/FAA conference summary cited previously indicates that, "At airports . . . it is estimated that the amount of pollution caused by aircraft is approximately equivalent to that contributed by ground vehicles".

Recently, federal, state and local government pressure has resulted in the virtual elimination of visible smoke and the reduction of other aircraft emissions. The amount of the reduction varies with the kind of pollutant.

With respect to aircraft emissions, new EPA Standards limit emissions of smoke, carbon monoxide, hydrocarbons, and nitrogen oxide for all civil aircraft with only limited exceptions - helicopters and radial engines. All new turbine engines manufactured after January 1, 1979 are covered by the new standards.

All new turbine engines for general commercial use certified after January 1, 1981, will be required to meet even more stringent emission standards. All aircraft piston engines produced after December 31, 1979, will also have to meet the new standards. The 1979 standards for all Turbine engines with less than 8,000-lb thrust represent reductions of 80 percent for hydrocarbons, 60 percent for carbon monoxide, and 20 percent for nitrogen oxides.

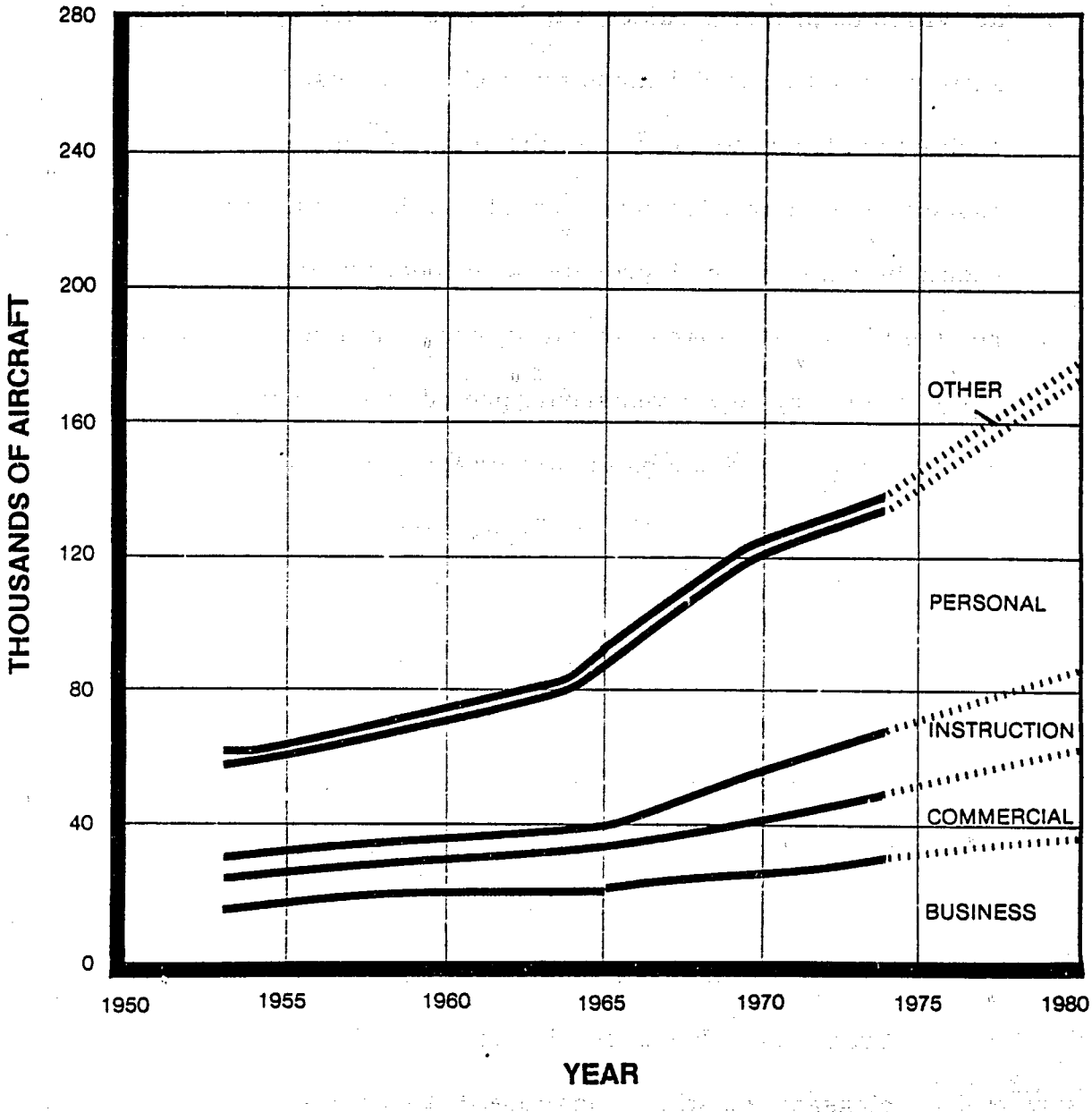
The 1979 standards for larger jet engines represent reductions of 70 percent for hydrocarbons, 60 percent for carbon monoxide, and 50 percent for nitrogen oxides. Lesser reductions are called for in piston-engine standards. The 1979 standards also apply to the auxiliary power units aboard aircraft.

Engines of over 8,000-lb thrust will have to meet the 1981 standards, which represent further reductions from the 1979 standards of 50 percent for hydrocarbons and 30 percent for carbon-monoxide (no change in nitrogen oxides).

MISSION OF PALOMAR

The mission of Palomar is to provide general aviation services to residents of north San Diego County. In addition to improving and expanding existing facilities, new and compatible facilities which are consistent with existing and proposed development in the airport vicinity, should be located on the Palomar property.

In addition to the typical industrial and commercial activities which require proximity to general aviation facilities, an examination of the significant aspects of emerging affluence suggests an expanding role for general aviation airports. Figure I.2 indicates that the number of general aviation aircraft could increase to 260,000 by 1980, but more important, over 50 percent of all general aviation aircraft will be used for personal and pleasure purposes. If leisure becomes a dominant force in people's lives as trends indicate, development of Palomar should provide users with access to a wider variety of recreational related support activities. Leisure activities are compatible with airport development in the sense that they occupy areas which separate airport activity from adjacent land uses. The provision of leisure



SOURCE: FAA

General Aviation Aircraft by Use

Figure I.2

activities on property adjacent to Palomar would not only help satisfy the anticipated demand for such activities, but would also enable the airport to counteract the negative image too often associated with aviation development. A development policy should be pursued which provides additional aviation facilities related to runway capacity to satisfy local area needs. Specifically, the policy objectives should provide the means to:

- Control land use on the airport property,
- Insure that the activities located on land in the immediate vicinity are compatible with the functional requirements of the airport,
- Control development of the airport property by balancing airside and groundside capacity,
- Satisfy aviation and aviation related uses within the boundaries of acceptable noise and pollution emission standards,
- Create an environment that is physically pleasant and stimulating (one that contains a functionally and economically viable mixture of land uses which can mutually benefit from their association with each other), and

- Create an environment which is responsive to shifts in market demand, changing values, lifestyles and technology.

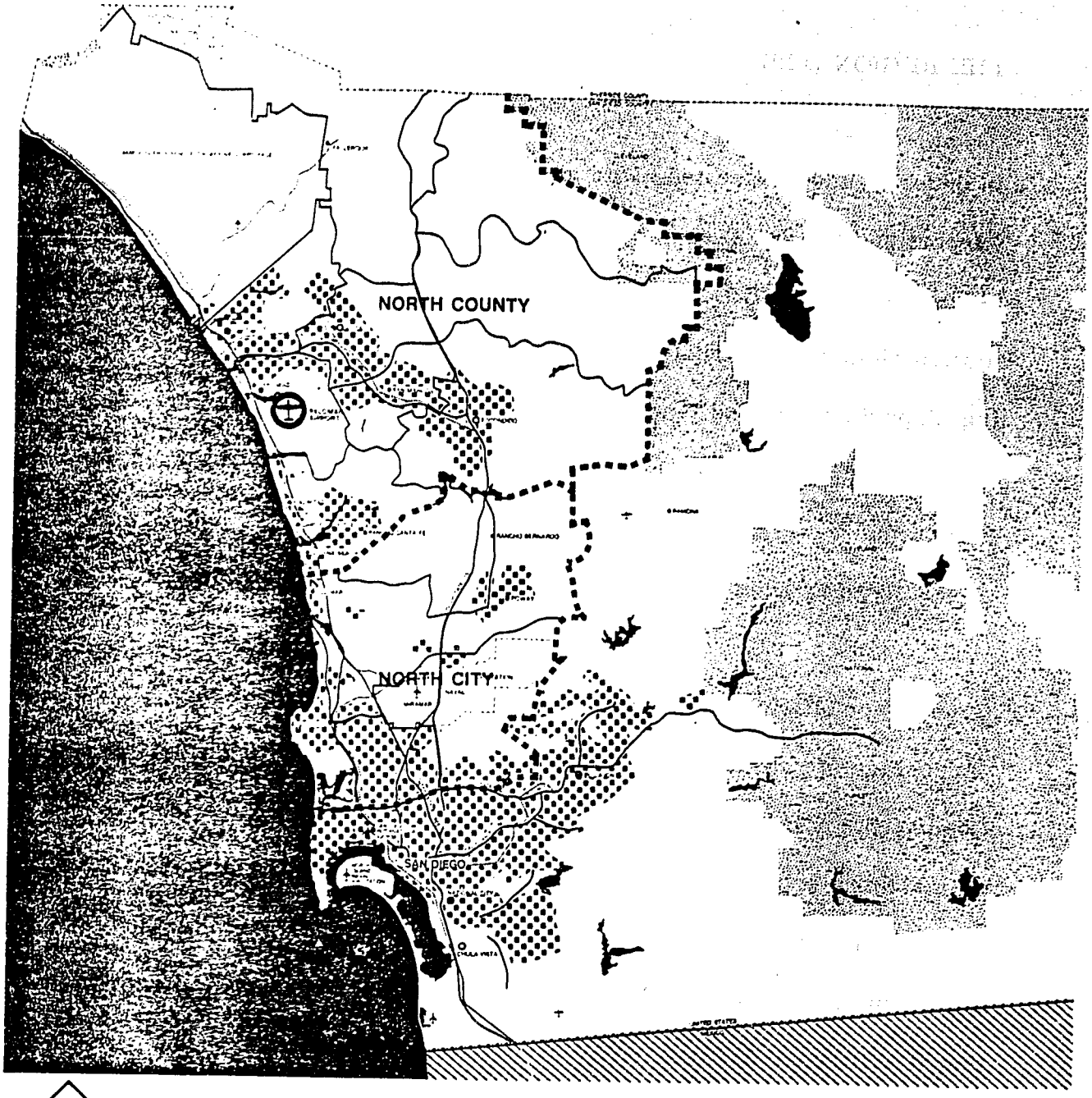
Attaining these objectives will result in an aviation facility that provides service, employment and income to the airport and facilities to make the airport attractive as a destination and a community center. Palomar Airport can and should be both an asset and a good neighbor to the community.

THE REGION (129)

In order to understand the basic relationship between Palomar Airport and the San Diego region, several key factors were reviewed (Figure II. 1). They included population growth and distribution, the regional transportation network with its resulting airport access and land use.

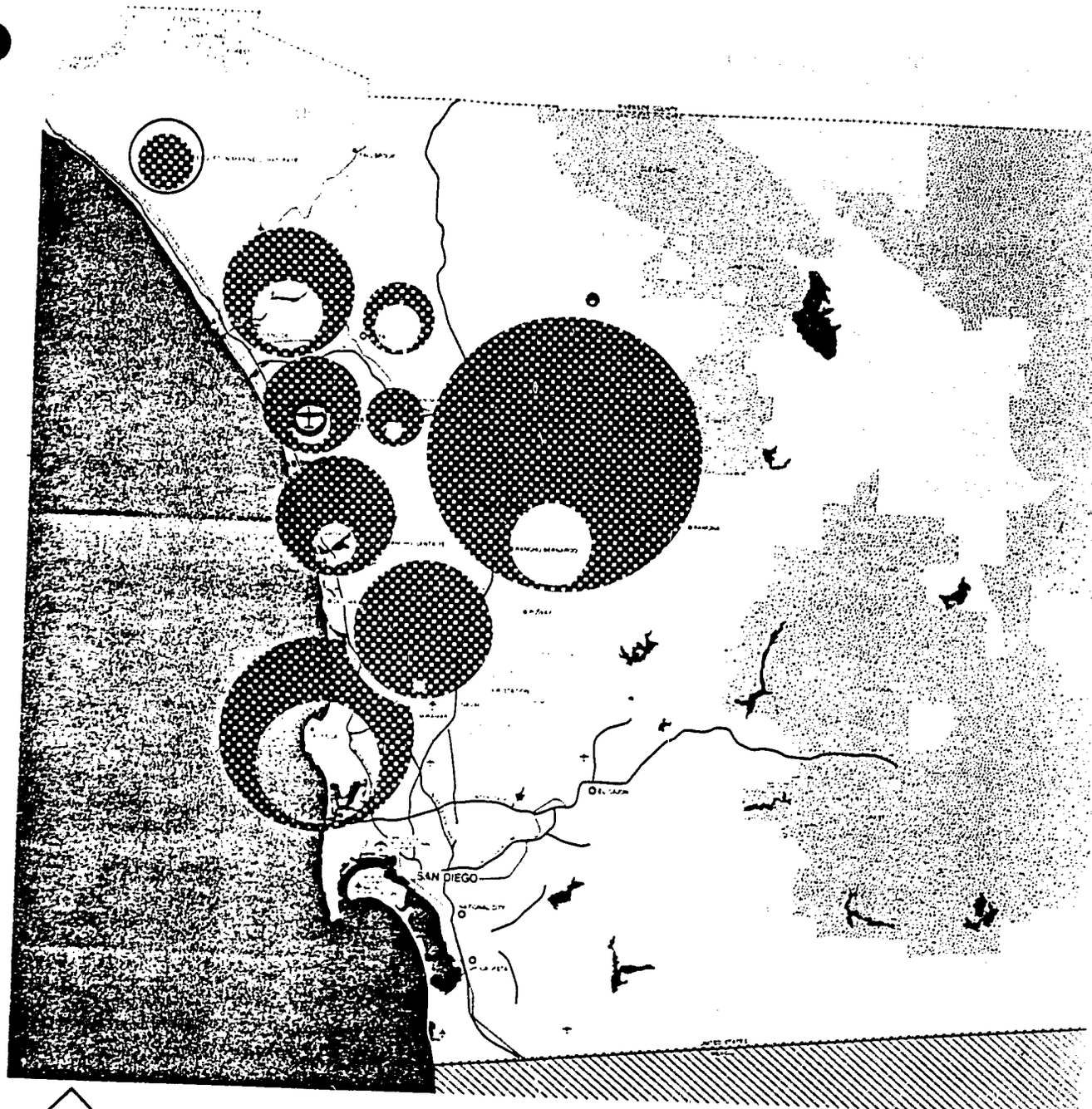
Population

Generally, San Diego County has grown in population faster than other counties in California. Over the past thirty years, the County's population has more than quadrupled. The greatest percentage of growth has occurred in the southern part of the County, but a significant population increase has taken place in the northern areas as well. This growth has resulted in a total County population of about 1.5 million people. It is expected that the County's population will continue to grow and forecasts indicate that it will reach 2.3 million by 1990. A high percentage of this new growth will take place in the northern portions of the County.



Regional Context

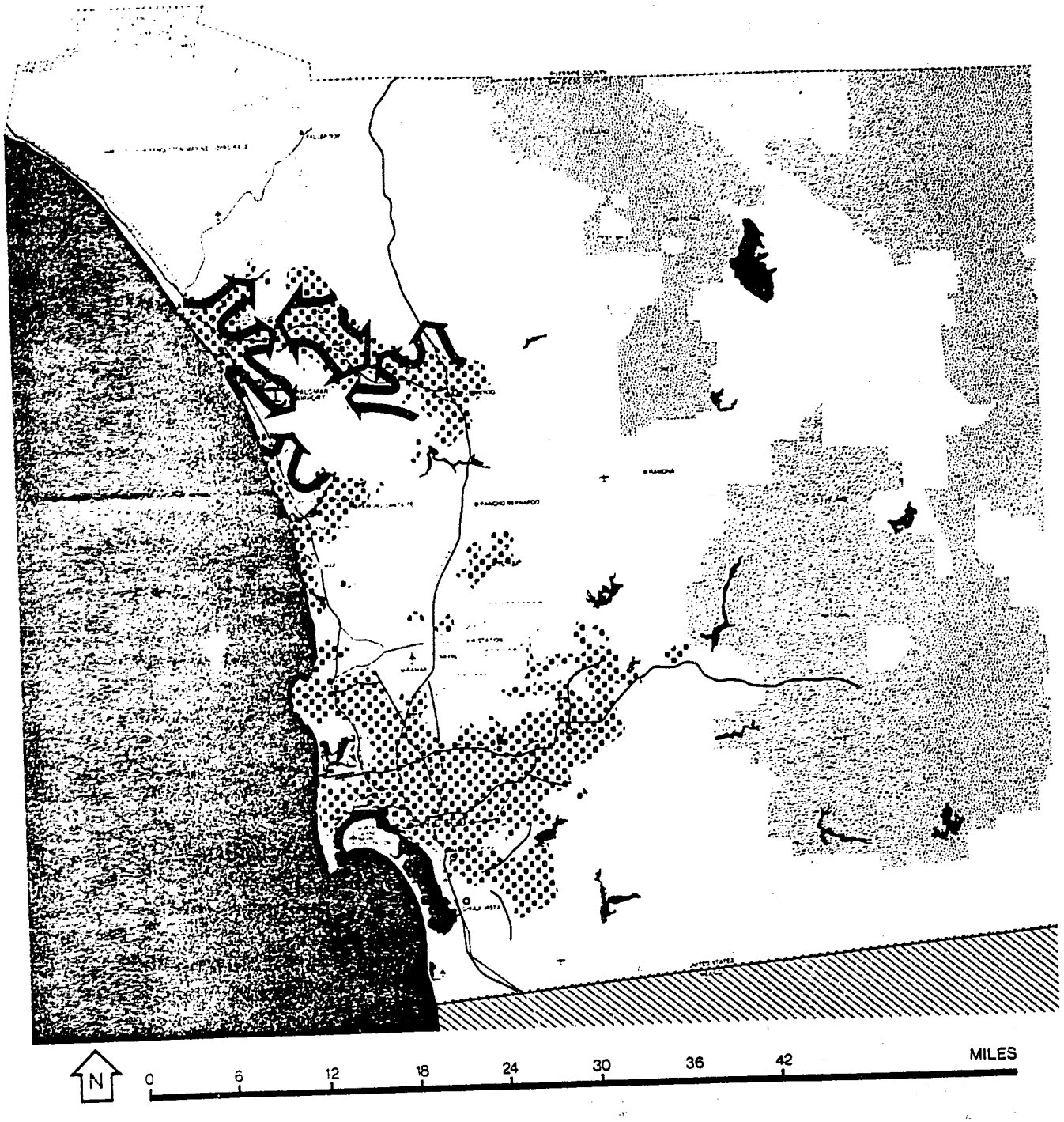
Figure II.1



Population Trends

Figure II.2

Figure II. 2 illustrates the growth trends for the selected statistical areas in the northern portion of the County. In addition to the major statistical areas in the North County, several were included from the North City subregional area. They were included because it was found that some of the airport users come from these other areas. It is clear that this substantial population growth will be impacting the character of and demand for general aviation facilities at Palomar. Therefore, it is important to note the nature of this growth in terms of its distribution and relationship to the area of the airport. Figure II. 3 , North County Growth Directions, diagrammatically illustrates the geographic location of the existing urbanized areas in San Diego County and the anticipated direction of growth. In reviewing the alternative proposed population distribution patterns for the northern portion of the County, as postulated by the San Diego Comprehensive Planning Organization in their regional development alternatives, it is clear that a continuing increase of urbanization will occur east from Vista and west from Escondido along California Highway 78. In addition, Carlsbad's rapid increase in population will be accommodated in an eastern and southeastern direction toward the Palomar facility.



North County Growth Directions

Figure II.3

The combined impact of increasing population growth and population distribution adjacent to the Palomar Airport fortifies the need to expand this already busy, general aviation facility.

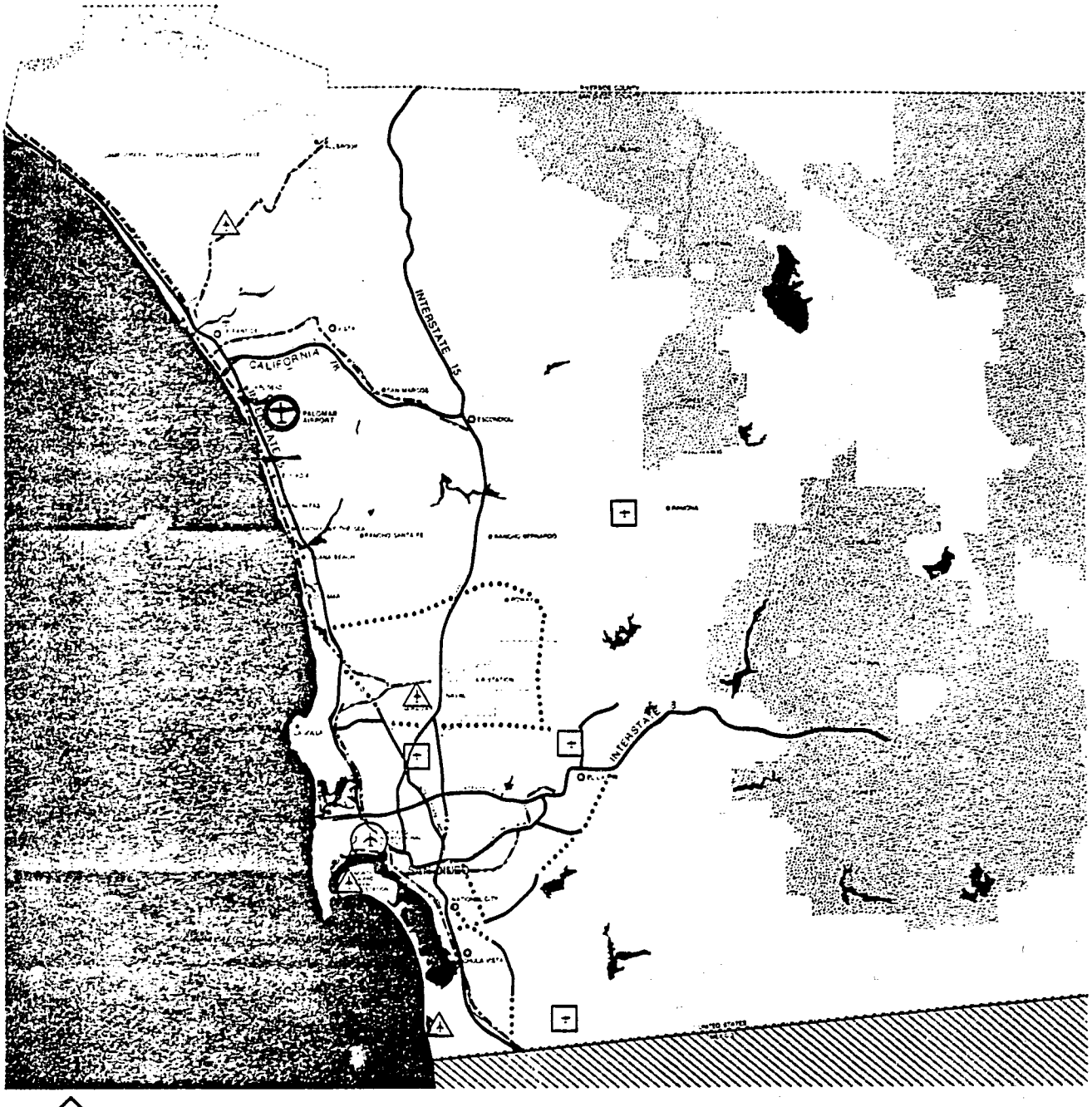
Networks

In close proximity to Palomar are three major freeways which provide the site with good access to most of San Diego County and to the southern portions of Orange and Riverside Counties. This network is illustrated by Figures II. 4 and 5.

The San Diego Freeway (Interstate Highway 5) is approximately 3.5 miles west of the site. This freeway heads north and south adjacent to the many coastal communities from Los Angeles in the north to San Diego in the south.

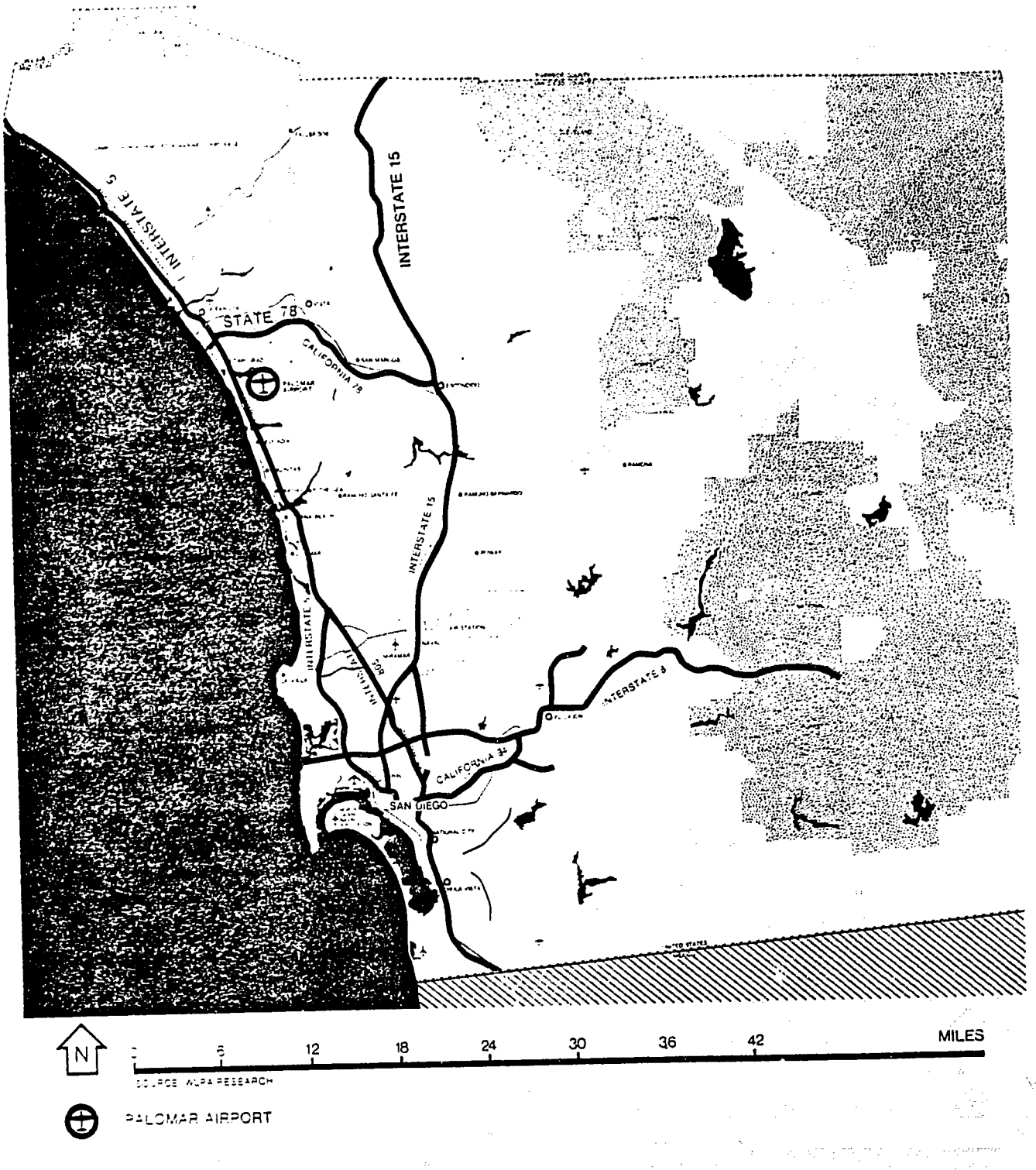
Interstate Highway 15 is about ten miles east of the site and also runs in a north-south direction. To the north it connects many inland communities including San Bernardino and Riverside and to the south serves Escondido and San Diego.

State Highway 78 is north and east of the airport and connects Oceanside, Carlsbad, Vista, San Marcos and Escondido; at Escondido it intersects with Interstate 15. Palomar Airport Road, the main access to the airport, connects with Highway 78 at San Marcos and with Interstate 5 at the coast.



Transportation Networks

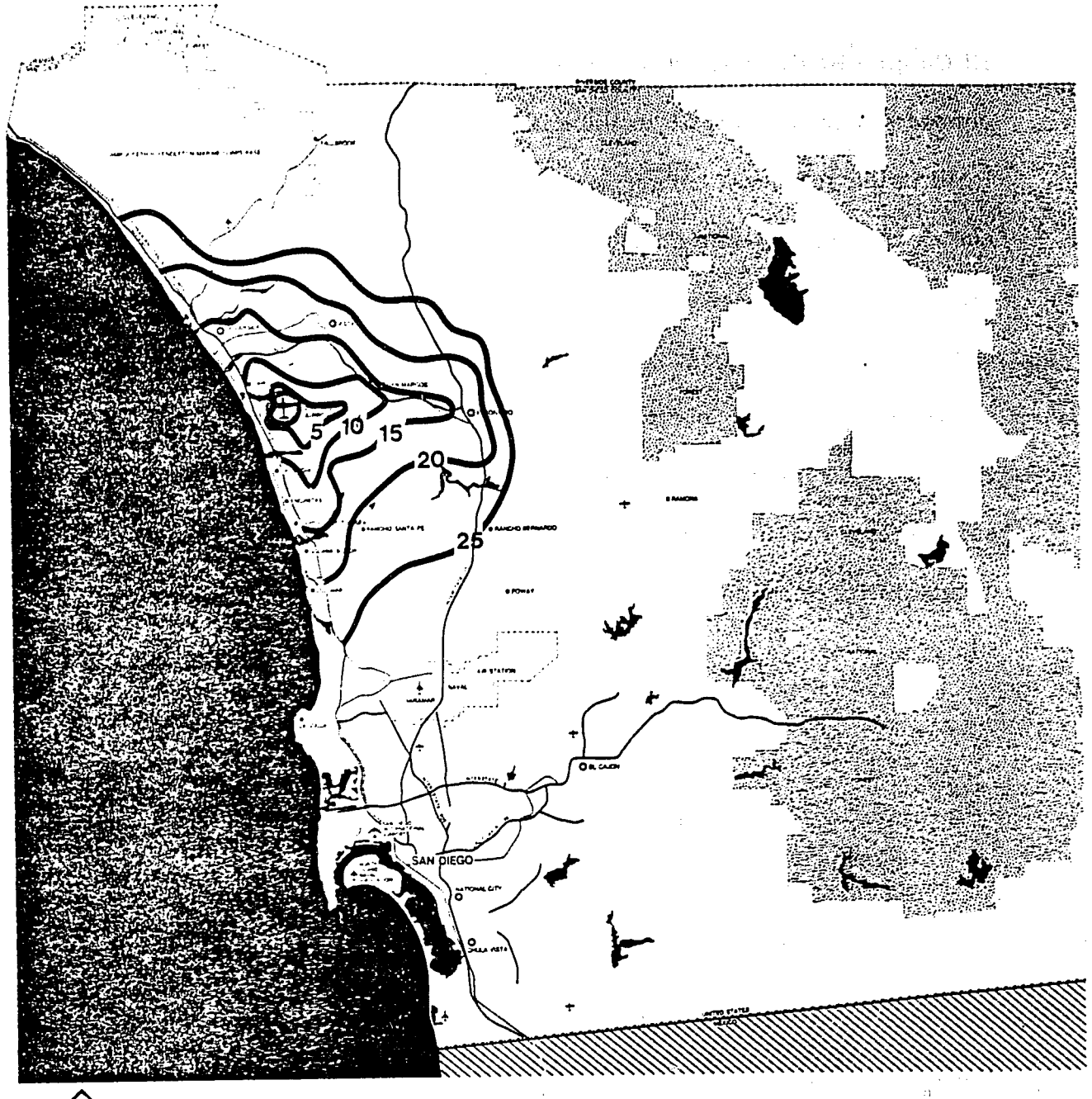
Figure II.4



Regional Access

Figure 11.5

El Camino Real, which is located adjacent to the airport on the east, connects with Highway 78 to the north and intersects Palomar Airport Road in the southeast corner of the airport property. Figure II. 6 shows the driving time characteristics of the present network. The diagram generally reflects that a great percentage of the present urbanized area and forecast population growth is readily accessible to the airport. The County has planned air carrier service at other fields in the region and therefore Palomar will be developed primarily as a general aviation facility. This is consistent with the Airport's accessibility to major residential and business population densities within the County.



1974 Travel Time Radius From/To Palomar

Figure II.6

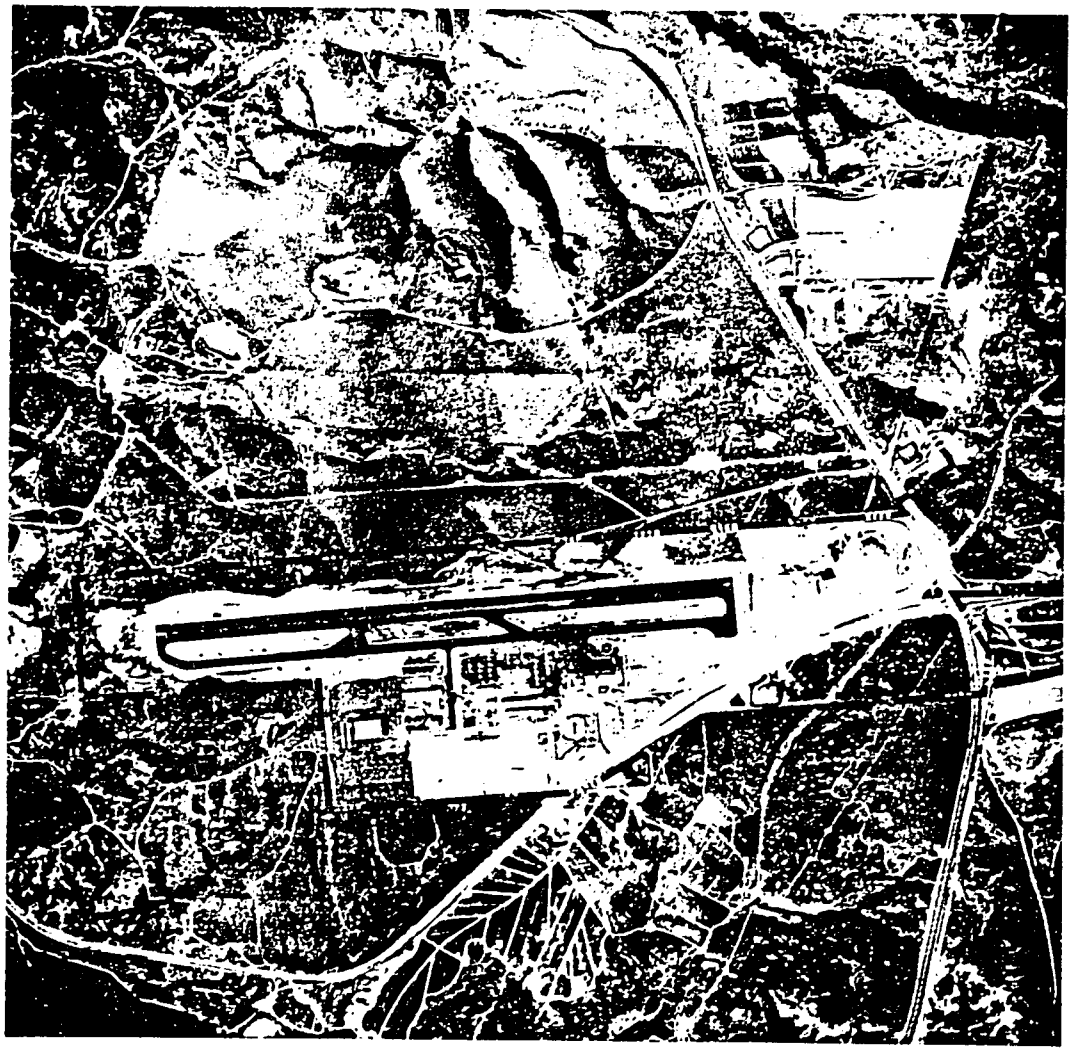
Land Use

The existing, generalized zoning surrounding the Palomar Airport is shown in Figure II.7, Zoning Diagram. The map was developed from a combination of sources including the City of Carlsbad and the County of San Diego. In studying the source documents and the generalized zoning diagram, it appears that the Airport does not conflict with the surrounding land uses. To the north of the Airport, commercial and manufacturing uses are dominant with some rural residential density of approximately one dwelling unit per acre, to the northwest. Compatible uses are found to the east of the facility. Directly adjacent to the south the area is predominantly agriculture, but to the southeast and southwest the area is zoned for residential uses. On the west side of the facility, agriculture has been designated, but further west of this agricultural zone there are residential uses planned. This is generally considered undesirable, but the residential zone appears to be at a sufficient distance from the Airport facility to be considered acceptable.

The local land use pattern is generally compatible with the Airport, but it should be continually reviewed in concert with the airport planning effort so that potential conflicts can be carefully considered and fully mitigated in support of the Airport/ Community plans.

Zoning Diagram

Figure II.7



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SOURCE: SAN DIEGO COUNTY AIRPORTS DIVISION

AIRPORT BOUNDARY

Palomar Airport — 1973

Figure II.8

THE AIRPORT (129)

Palomar Airport is a general aviation airport designated as a "General Utility" facility by the FAA. It is located 3.5 miles from the Pacific Ocean, 43 miles southeast from Orange County Airport and 35 miles northeast from San Diego Lindbergh. It lies 9.2 miles southeast of Oceanside and 4.3 miles southeast of the Carlsbad civic center and is contiguous on two sides with the corporate limits of the City of Carlsbad. (See Figure II.8)

In addition to its utility in the finished assembly of Hughes helicopters, the airport serves as the major general aviation facility for North San Diego County. It is constructed on a series of leveled hills and sanitary land-filled gullies. The terrain is typical of the surrounding countryside with the land to the west sloping downward to the ocean. There is a hill about one mile to the east which affects the approach slope angle to Runway 24. A half mile from the southwest corner of the field there is a 92' radio tower that is a recognized hazard although not in conflict with FAA Part 77 standards. Approximately 2000' from the end of Runway 6 there are several San Diego Gas and Electric Company high-tension

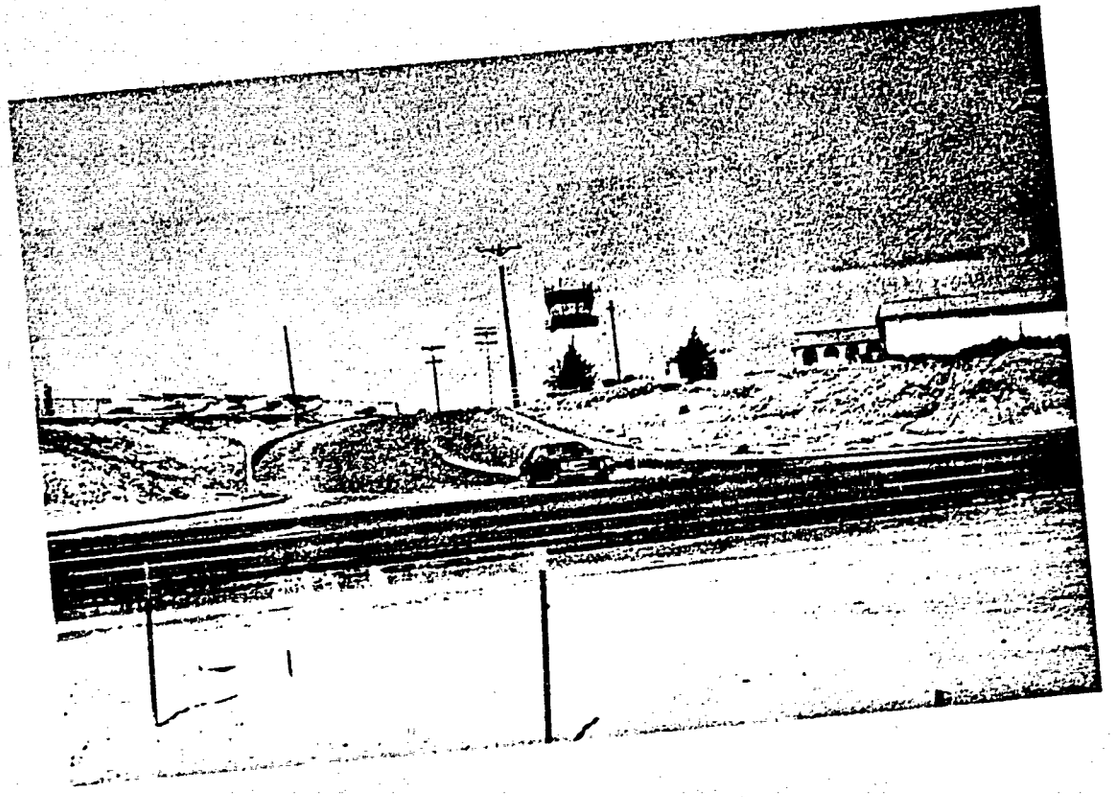


Figure II.9

Palomar Airport Entrance

power lines. They do not penetrate the approach surfaces, but they are difficult to see when restricted visibility prevails and are therefore marked.

The airport is bounded by privately owned large land holdings on the north and west, by Palomar Airport Road on the south and by the El Camino Real on the east.

History

The 255 acre site was acquired in 1958 as a replacement for Del Mar Airport which had been owned and operated by San Diego County since 1947. Del Mar was closed in order to provide right-of-way for Interstate Highway 5 and the County was reimbursed by the State Division of Highways.

Proceeds from the Del Mar sale, coupled with Federal Aid Airport Funds and County money, provided the first stage development of the airport.

Initially, the airport opened on March 20, 1959, with a 3,700' x 100' runway, the necessary taxiway, apron and other facilities for day VFR operation.

On July 15, 1959, Bonanza Air Lines inaugurated scheduled passenger service with an IFR approach approved September 4, 1959. The service was discontinued on April 30, 1960, however, their influence was felt by installation of a lighting system and proposed runway extension which in fact took place in 1961.

The present airport configuration is the result of that 1961 expansion of the runway to 4,700' x 150' and widening of the taxiway to 75'. The control tower was placed in operation March 26, 1973.

The original investment for the airport was $409,000 and the 1961 expansion was $503,000, which raised the total to $912,000. (Table 1.)

Although commuter type airlines have served Palomar from time-to-time, the precarious financial position of these operators, coupled with the lack of an economical short haul airplane, have not provided the airport with service for any substantial period of time. The recent financial success of Golden West Airlines shows this trend to be going the other direction. Historical airport operation statistics are shown in Tables 2., 3. and 4.

TABLE 1.

PALOMAR AIRPORT

1st and 2nd Stage Development Costs, and Comparative Costs to Duplicate the Same Development Based on July 1970 Prices

1st Stage 1957
2nd Stage 1961

	INITIAL COST			1970 COST (Approx.)		
	1st Stage	2nd Stage	Total	1st Stage	2nd Stage	Total
Land	$170,154	$ -0-	$170,154	$1,275,000 (3)	$ -0-	$1,275,000
Construction*	205,940 (1)	457,662	663,602	358,000 (2)	733,400	1,091,400
Engineering#	32,817	45,042	77,859	43,000	88,000	131,000
TOTALS	$408,911	$502,704	$911,615	$1,676,000	$821,400	$2,497,400

* Construction costs include underground and overhead utilities.
# Includes construction staking and inspection.

(1) Includes $17,205 for Administration Building complete.
(2) Includes $49,000 for Administration Building complete.
(3) 255 acres at $5,000/acre.

Source: Airport Manager, Palomar Airport

TABLE 2

BASED AIRCRAFT - TOTAL OPERATIONS ANNUAL

Calendar Year	Number Aircraft	Number Operations
1963	60	41,000
1964	60	45,000
1965	75	54,000
1966	100	106,000
1967	118	161,000
1968	178 *	178,000 *
1969	237	185,000
1970	242	198,000
1971	182 **	205,000 **
1972	187	182,000
1973	191	201,000

* Hughes Tool Co. expansion
** Hughes Tool Co. cut-back

TABLE 3

1973 OPERATIONS BREAKDOWN

Local Operations percent of total	74%
Local Operations	149,000
Itinerant Operations	52,000
Practical Annual Capacity - Single R/W	235,000
Instrument Operations	13,750

TABLE 4.

Airport Operations Budget 1972-73

Salaries and Wages	$ 99,434	
Service & Supplies	48,000	
Fixed Assets	692	
Total Operations	$148,126	
Direct Revenue		
Rents, Concessions, Fees & Misc.	$ 40,800	
Direct Cost of Operation		($107,326)
Indirect Revenue		
In Lieu Rentals	$ 7,100	
Taxes Generated from Aircraft, Possessory Interest and Sales	140,957	
	$148,057	
Profit of the Airport		$ 40,731

As of January 10, 1973

Annual Sales Tax (all leases reporting)	$ 50,137
Annual Payroll at Palomar Airport	$2,162,977

Existing Conditions

Figure II.10

Facilities

The airport facilities are described in a listing found in the June 6, 1974 issue of "Airman's Information Manual, Part 3", published by the Federal Aviation Administration.

The airport is an IFR facility located four (4) nautical miles southeast of the City of Carlsbad. Its field elevation is 328' MSL.

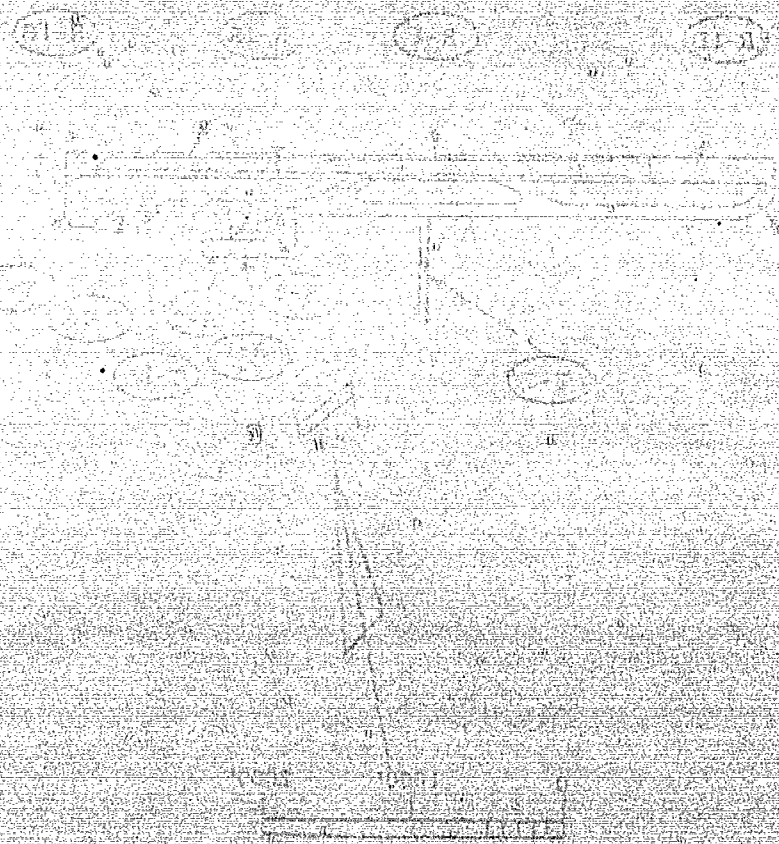
Because of the characteristics of the terrain, Runway 6/24 has a noticeable swale in the middle of its length which causes an optical illusion of shortened length when on final approach. Runway 24 is programmed for an ILS in 1975 and a MALSR approach lighting system was installed in 1974.

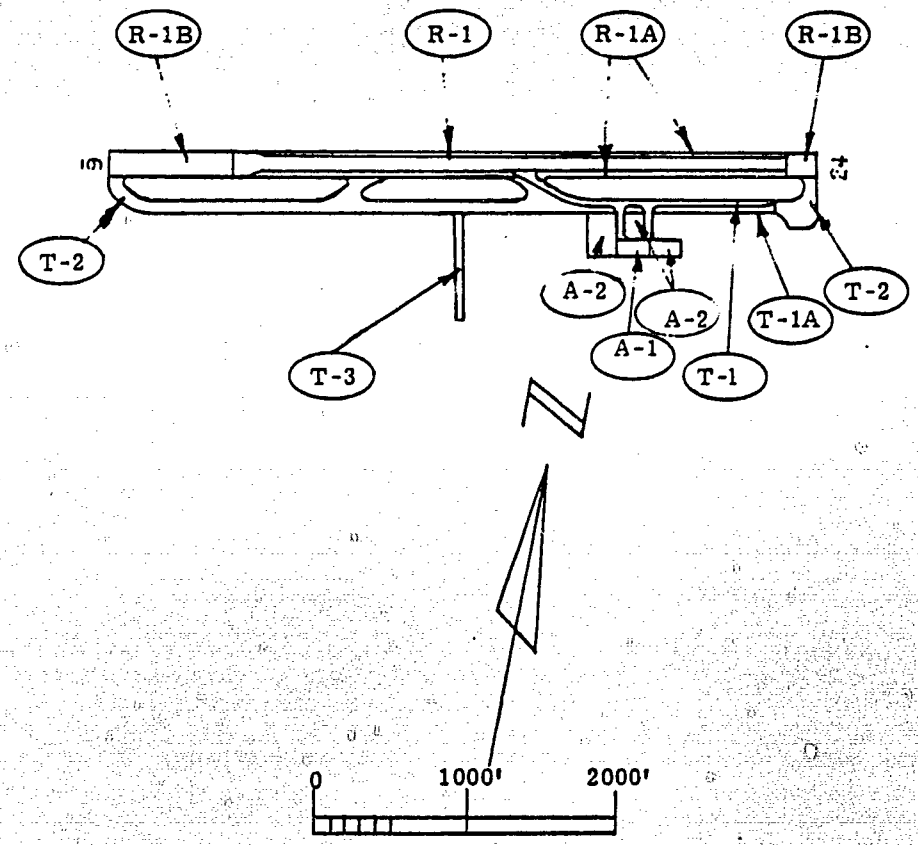
Currently the IFR approach utilizes the Oceanside VOR which results in aircraft flying over the Carlsbad area. This will be revised with installation of the ILS.

Runway 6/24 is 4,700' long. The pavement strengths are rated for runway weight bearing capacity for aircraft described as follows:

Single wheel type landing gear	-	60,000#
Dual wheel type landing gear	-	90,000#
Dual tandem type landing gear	-	140,000#

Pavement evaluation is based on the FAA classifications and reports which are shown in Figure II. 11 and II. 12. The forms relate the area on the airport to an evaluation of its pavement composition.





SCALE: 1" = 1,000'	DATE: 3-17-70	R-RUNWAY, T-TAXIWAY, A-APRON	SITE: 1376.1
CITY: Carlsbad	AIRPORT: PALOMAR	STATE: Calif.	SHEET 2 OF 2

WE Form 5335-1(12-71)(Obsoletes previous edition)

Figure II.11

FEDERAL AVIATION ADMINISTRATION PAVEMENT STRENGTH SURVEY AIRPORTS DIV.-WESTERN REGION

PRECIP. 10.93" | FROST: None | DRAIN: Poor | R-RUNWAY, T-TAXIWAY, A-APRON | SITE: 1376.1

DATE: 3/18/70 | CITY: Carlsbad | AIRPORT: Palomar | STATE: Calif. | SHEET 1 OF 2

DATE OF INSPECTION: 3/17/70 | INSPECTED BY: C. M. Davidson

IDENT.	SOIL CLASS	SUB-G CLASS	SOURCE OF SOILS DATA	SUB-BASE	BASE	SUR-FACE	OVER-LAY	EQUIV. PAVE. THICK. S.B.	EQUIV. PAVE. THICK. BASE	EQUIV. PAVE. THICK. SURF.	GROSS LOAD (M) S	GROSS LOAD (M) D	GROSS LOAD (M) DT	BUILT UNDER	YEAR	REMARKS
R-1	E-8	F6	1773	-----	DG 9"	P-216 2"	3"AC	9"	6"	3"AC	50	70	100	FAAP -01	1959	Non-Critical
R-1A	E-8	F6	1773	5"	6"	3"AC		8½"	6"	3"AC	50	70	100	FAAP -03	1961	Non-Critical
R-1B	E-6	F4	1773	7"	7"	3"AC		7"	7"	3"AC	65	90	140	FAAP -03	1961	Critical
T-1	E-8	E6	1773	-----	DG 9"	P-216 2"	3"AC	6"	6"	3"AC	38	60	75	FAAP -01	1959	
T-1A	E-8	E6	1773	5"	6"	3"AC		5"	6"	3"AC	30	45	65	FAAP -03	1961	
T-2	E-6	F4	1773	7"	7"	3"AC		7"	7"	3"AC	65	90	140	FAAP -03	1961	
T-3	E-6	F4	County	-----	CR 4"	2"AC			5½"	1"AC	(Est) 5			County	1966	
A-1	E-8	F6	1773	-----	DG 9"	P-216 2"	3"AC	6"	6"	3"AC	38	48	75	FAAP -01	1959	
A-2	E-8	F6	1773	7"	7"	3"AC		8½"	6"	3"AC	45	60	90	FAAP -03	1961	

WE Form 5335-1(12-71)(Obsoletes previous edition)

Figure II.12

Airfield lighting includes a Rotating Beacon and:

Medium Intensity Runway Lighting - Runway 6/24

Visual Approach Slope Indicator - Runway 24
(With Threshold Crossing at 47' and a Runway reference point at 1,000')

Services available include:

Storage, major airframe and major power plant repairs

Fuel 80/87 av. gas, 100/130 av. gas, and kerosene, freeze point -40°F

Oxygen - high and low pressure

FAA operated control tower communicating at 118.6 and 120.15 mhz in the air and 121.8 mhz on the ground and operating between 7:00 a.m. and 11:00 p.m.

Radar services, including approach and departure control, and Radar Advisory Service for VFR aircraft

Unicom on frequency 123.0 mhz

The approach minimums for the airport are 700' ceiling and one (1) mile visibility.

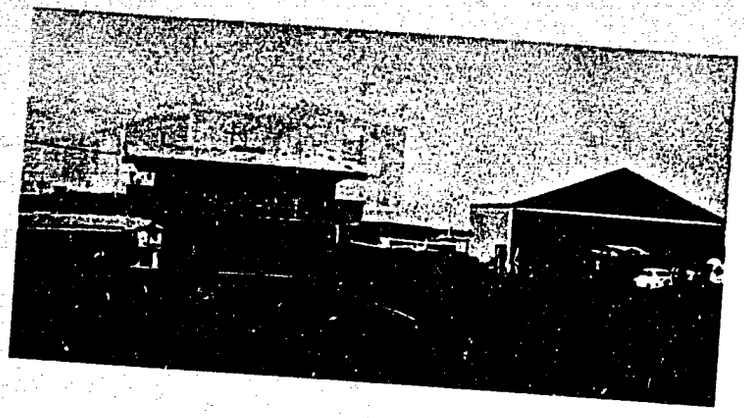
General aviation is currently housed in the area south of the runway and consists of five fixed base operators as follows:

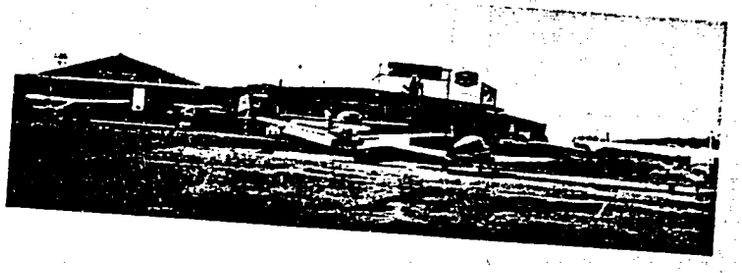
South Coast Flying Service

Garnair, Inc.

New Palomar Air Service

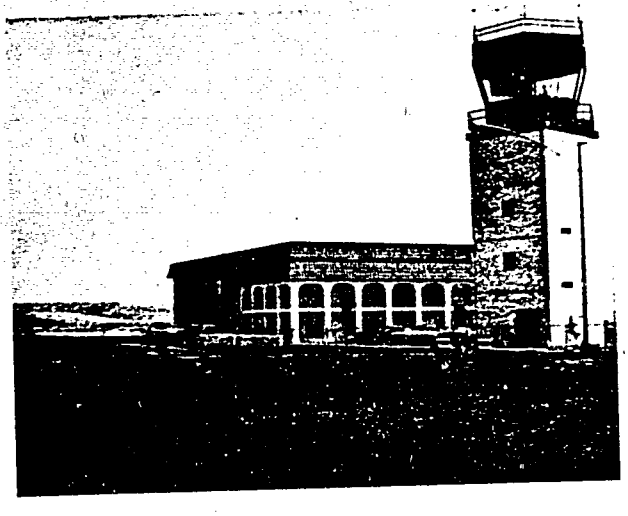
Flight Trails





Existing FBO

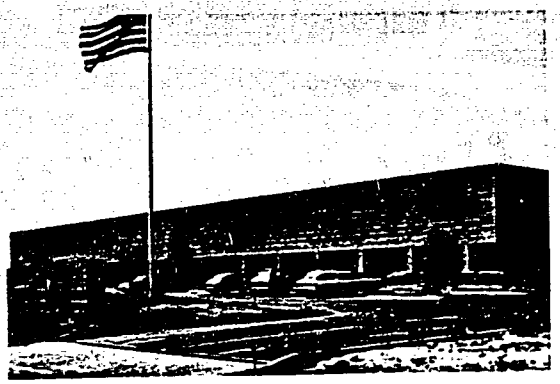
Figure II-13



Existing FBO

Figure II.14

ON AIRPORT



OFF AIRPORT

Existing Industrial

Figure II.15

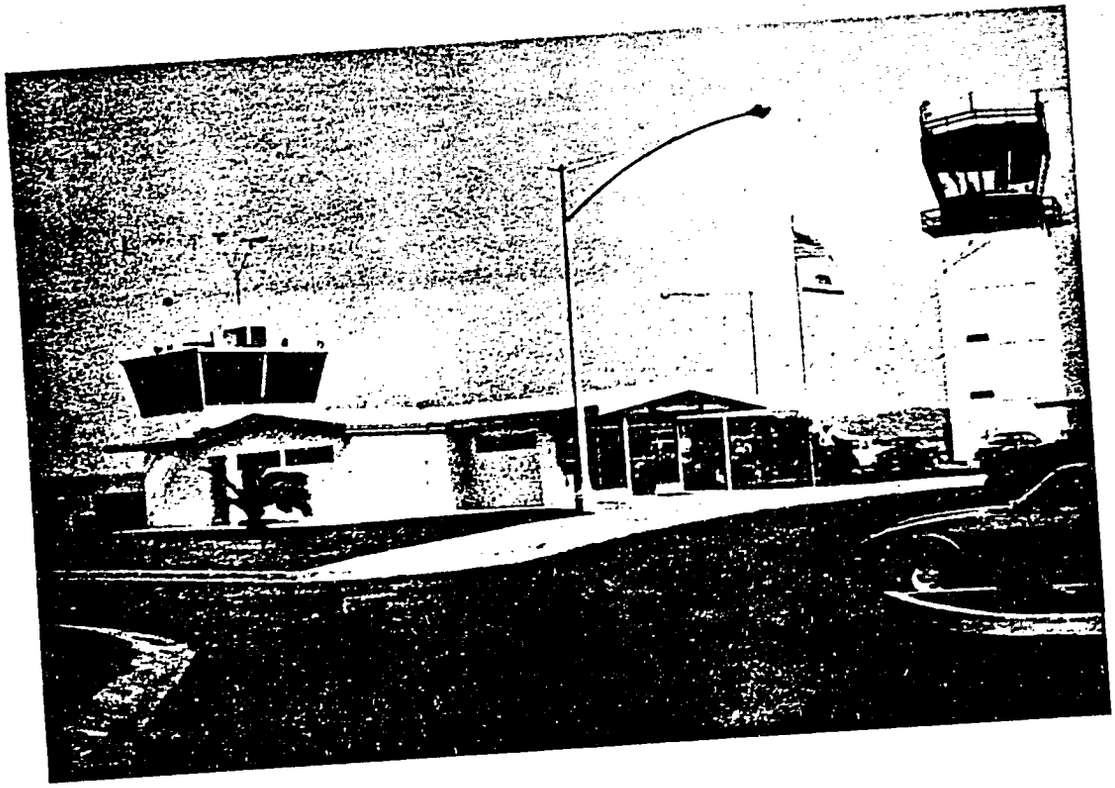


Figure II.16

Administration Building

Aircraft Mobil Homes

North County Aviation

Transient facilities are available on the ramp at the administration building as well as at the FBO's.

The airport fueling systems consist of eight underground tanks each with 10,000 gallon capacity resulting in total airport capacity of 80,000 gallons. There are three fuel companies presently represented on the airport.

Aircraft fueling is normally from underground tank-to-truck-to-aircraft. Pit-type fueling exists, however, at two of the FBO's. The administration building also serves as the terminal facility.

Ground Access

Palomar is strategically located as a result of being served by two major roads; El Camino Real running north and south and Palomar Airport Road running east and west. (Figure II. 17).

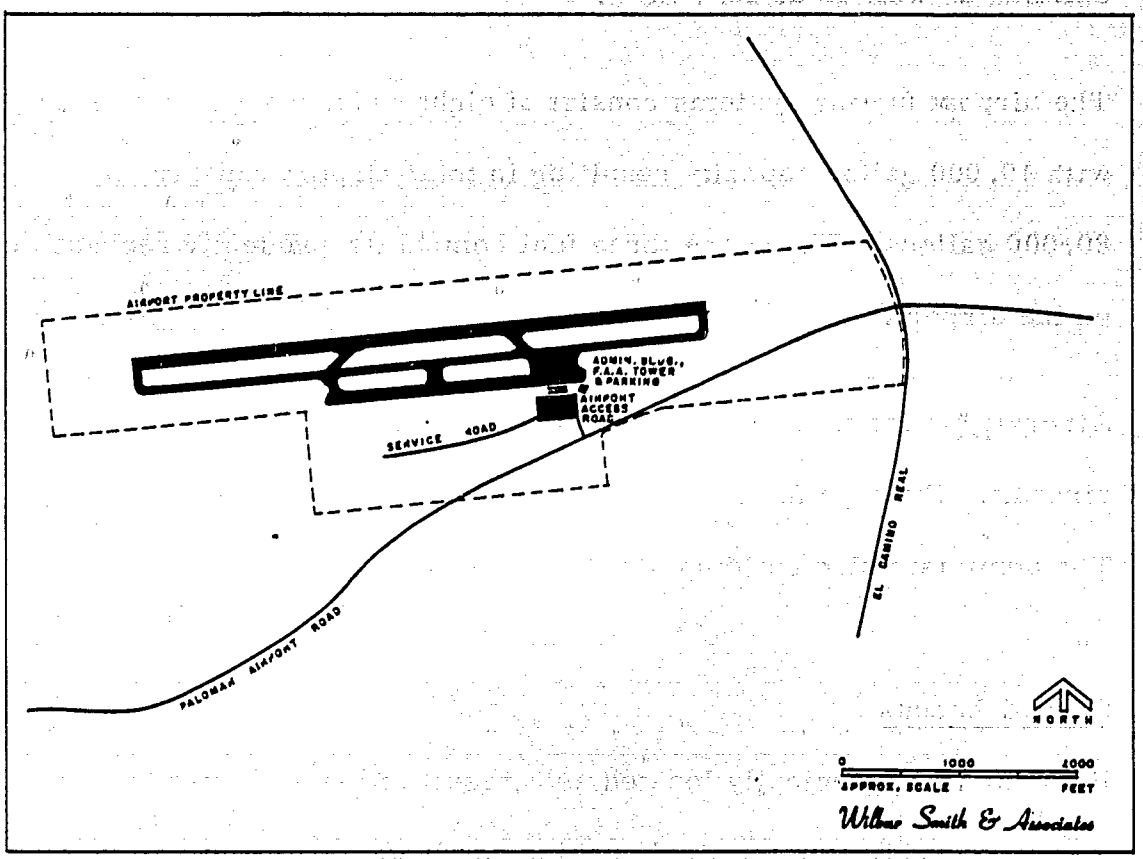
Airport Property

An "Exhibit A" description of property owned and controlled by the County is found in Figure II. 18.

Utilities

Schematic locations of utilities now existing on the airport property are found in Figures II. 19 and II. 20.

LOCAL ACCESS NETWORK – PALOMAR AIRPORT



Access Roads

Figure II.17

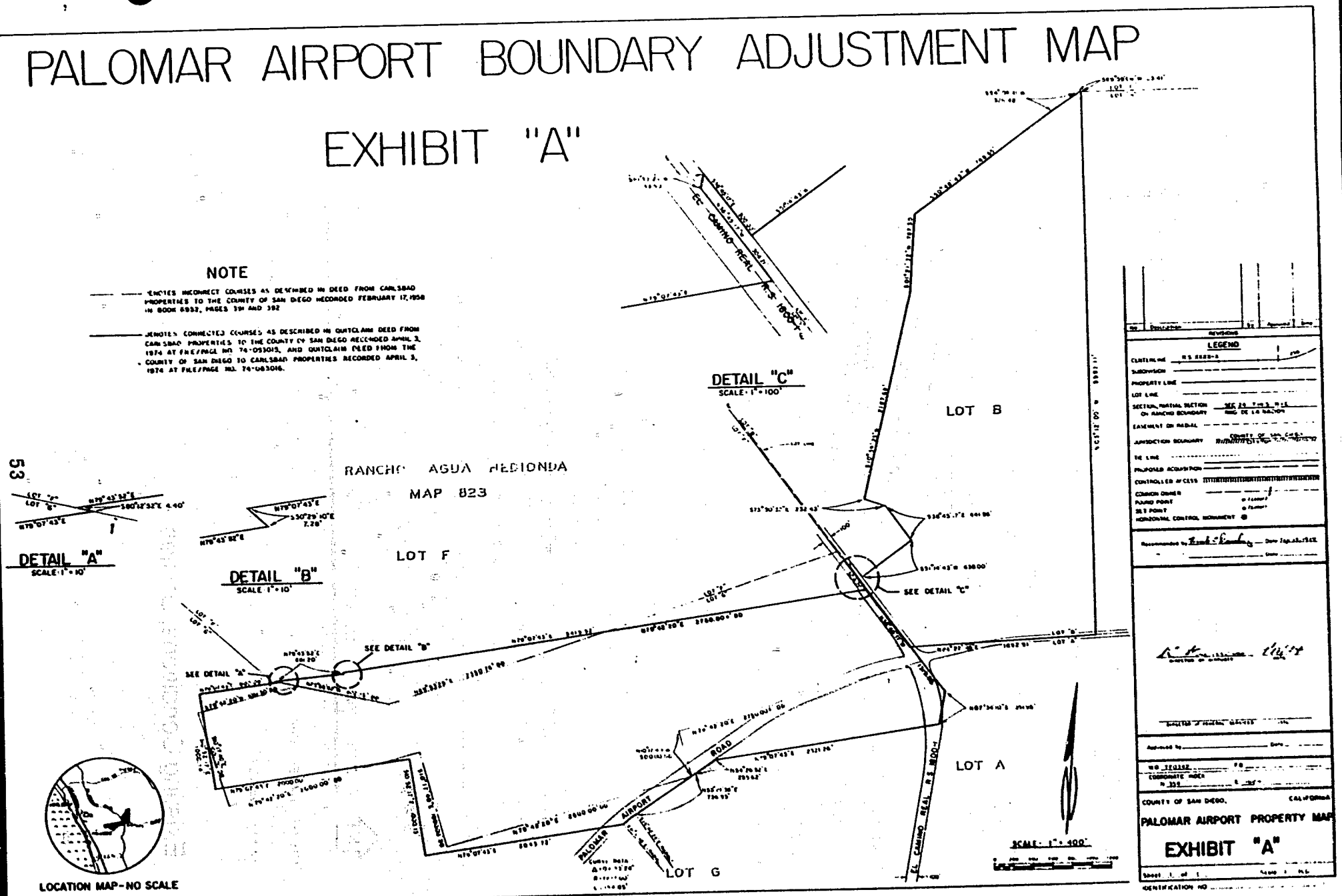
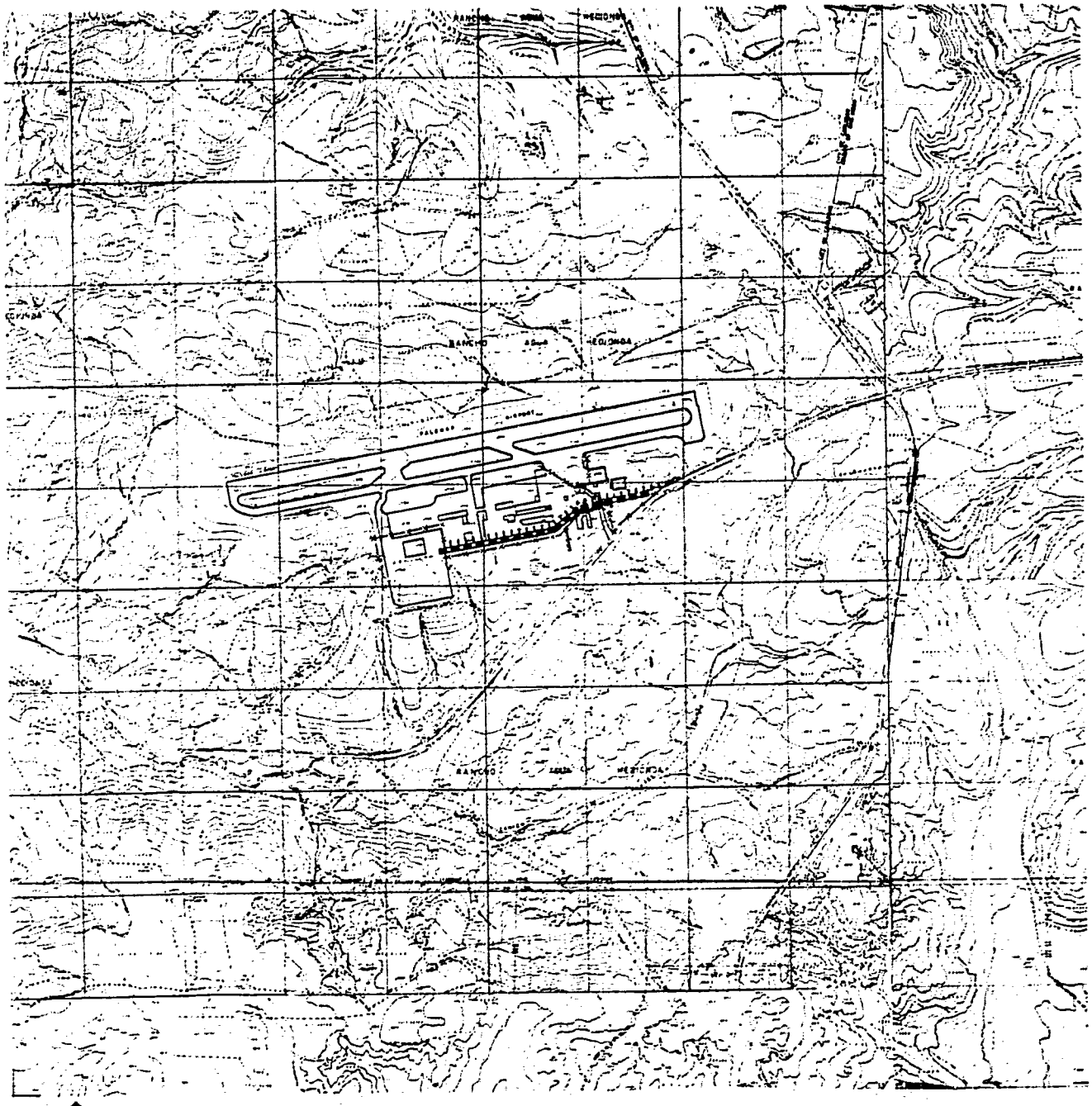

PALOMAR AIRPORT BOUNDARY ADJUSTMENT MAP
EXHIBIT "A"
NOTE
XXXX DENOTES INCORRECT COURSES AS DESCRIBED IN DEED FROM CARLSBAD PROPERTIES TO THE COUNTY OF SAN DIEGO RECORDED FEBRUARY 17, 1958 IN BOOK 6932, PAGES 391 AND 392
XXXX DENOTES CORRECTED COURSES AS DESCRIBED IN QUITCLAIM DEED FROM CARLSBAD PROPERTIES TO THE COUNTY OF SAN DIEGO RECORDED APRIL 3, 1974 AT FILE/PAGE NO. 74-058015, AND QUITCLAIM DEED FROM THE COUNTY OF SAN DIEGO TO CARLSBAD PROPERTIES RECORDED APRIL 3, 1974 AT FILE/PAGE NO. 74-083016.
DETAIL "A"
SCALE 1" = 10'
DETAIL "B"
SCALE 1" = 10'
DETAIL "C"
SCALE 1" = 100'
RANCHO AGUA HEDIONDA
MAP 823
LOT B
LOT F
LOT A
LOT G
SEE DETAIL "A"
SEE DETAIL "B"
SEE DETAIL "C"
EL CAMINO REAL R.S. 1800'
PALOMAR AIRPORT ROAD
LOCATION MAP-NO SCALE
SCALE 1" = 400'
LEGEND
COUNTY OF SAN DIEGO, CALIFORNIA
PALOMAR AIRPORT PROPERTY MAP
EXHIBIT "A"

Figure II.18

Existing Conditions, Utilities

Figure II.19



N

0 500 1000 2000 5000 FEET

SOURCE: COUNTY AIRPORTS DIVISION

ELECTRIC

GAS

TELEPHONE

Existing Conditions, Utilities

Figure II.20

Airspace

The present instrument landing procedures at Palomar utilize the Oceanside VOR as shown on Figure II. 21.

There is also an RNAV procedure shown in Figure II. 22.

The overall area procedures are shown in Figure II. 23 as they presently operate. The revisions are also shown (under the shading) which are anticipated when the ILS is installed on Runway 24L.

The ILS and a nondirectional beacon are programmed for installation by September, 1975, at which time the following procedures are proposed to work the airport into the airspace system.

Although the ILS will then become the primary approach procedure, it is expected that both the VOR and RNAV approaches will be retained for backup when the ILS is inoperative or for aircraft that are not equipped for Localizer/Glideslope reception.

Implementing the ILS procedures will relieve the present congestion at the Oceanside VOR since it will not be necessary for the procedures to commence at that point. Inbound traffic from the east will be turned onto the localizer at either Bond Intersection or the NDB either directly or from a holding pattern at 5,000' or above. Traffic inbound from the west and north will proceed to Vista Intersection

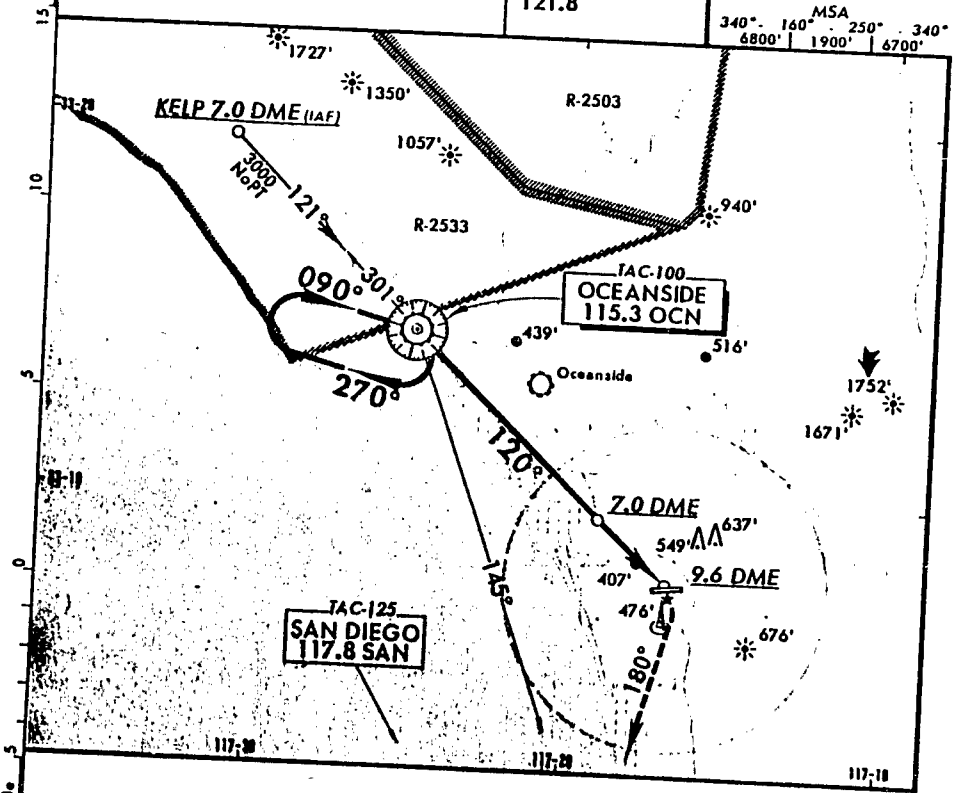
Jeppesen Approach Chart NOV 9-73 (13-2)

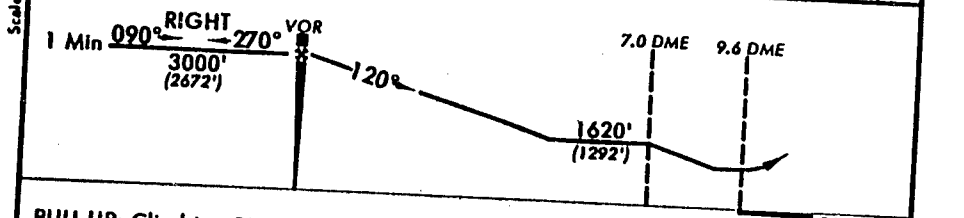
PALOMAR Tower 118.6 120.15 (OP NOT CONT)
When Control Zone not effective & without approved weather service, use Miramar NAS altimeter setting.
SAN DIEGO Approach (R) & Departure (R) 132.2
Ground 121.8

Apt. Elev 328'
Var 15°E
Class BVORTAC

CARLSBAD, CALIF.
PALOMAR
VOR DME-B
VOR 115.3 OCN

MSA 340°-160° 6800' | 160°-250° 1900' | 250°-340° 6700'





PULL UP: Climbing RIGHT turn to 3000 feet, heading 180° to intercept outbound OCN VOR R-145 direct SAN VOR, or as directed.

	CIRCLE-TO-LAND	
	Control Zone Effective or With Approved Weather Service MDA	With Miramar NAS Altimeter Setting MDA
A	840'(512')-1	920'(592')-1
B	940'(612')-1	1020'(692')-1
C	940'(612')-1½	1020'(692')-1½
D & J Eng Jet	1040'(712')-2	1100'(772')-2

Gnd speed-Kts	60	80	100	120	140	160

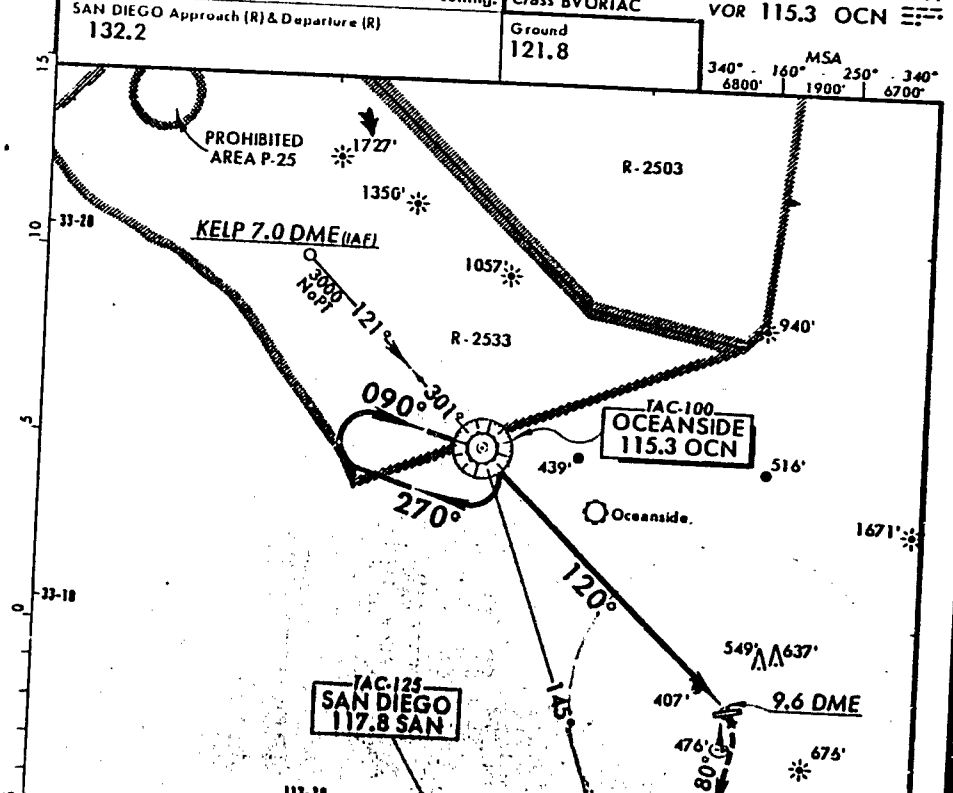
Jeppesen Approach Chart NOV 9-73 (13-1)

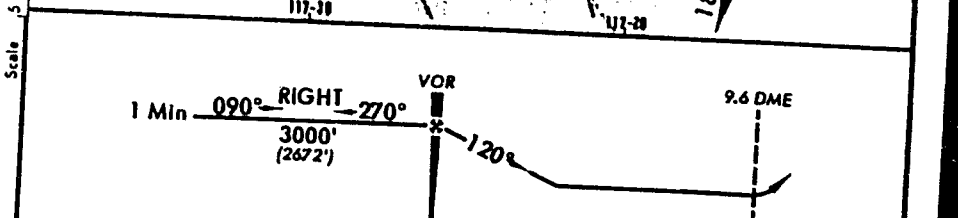
PALOMAR Tower 118.6 120.15 (OP NOT CONT)
When Control Zone not effective & without approved weather service, use Miramar NAS altimeter setting.
SAN DIEGO Approach (R) & Departure (R) 132.2
Ground 121.8

Apt. Elev 328'
Var 15°E
Class BVORTAC

CARLSBAD, CALIF.
PALOMAR
VOR-A
VOR 115.3 OCN

MSA 340°-160° 6800' | 160°-250° 1900' | 250°-340° 6700'



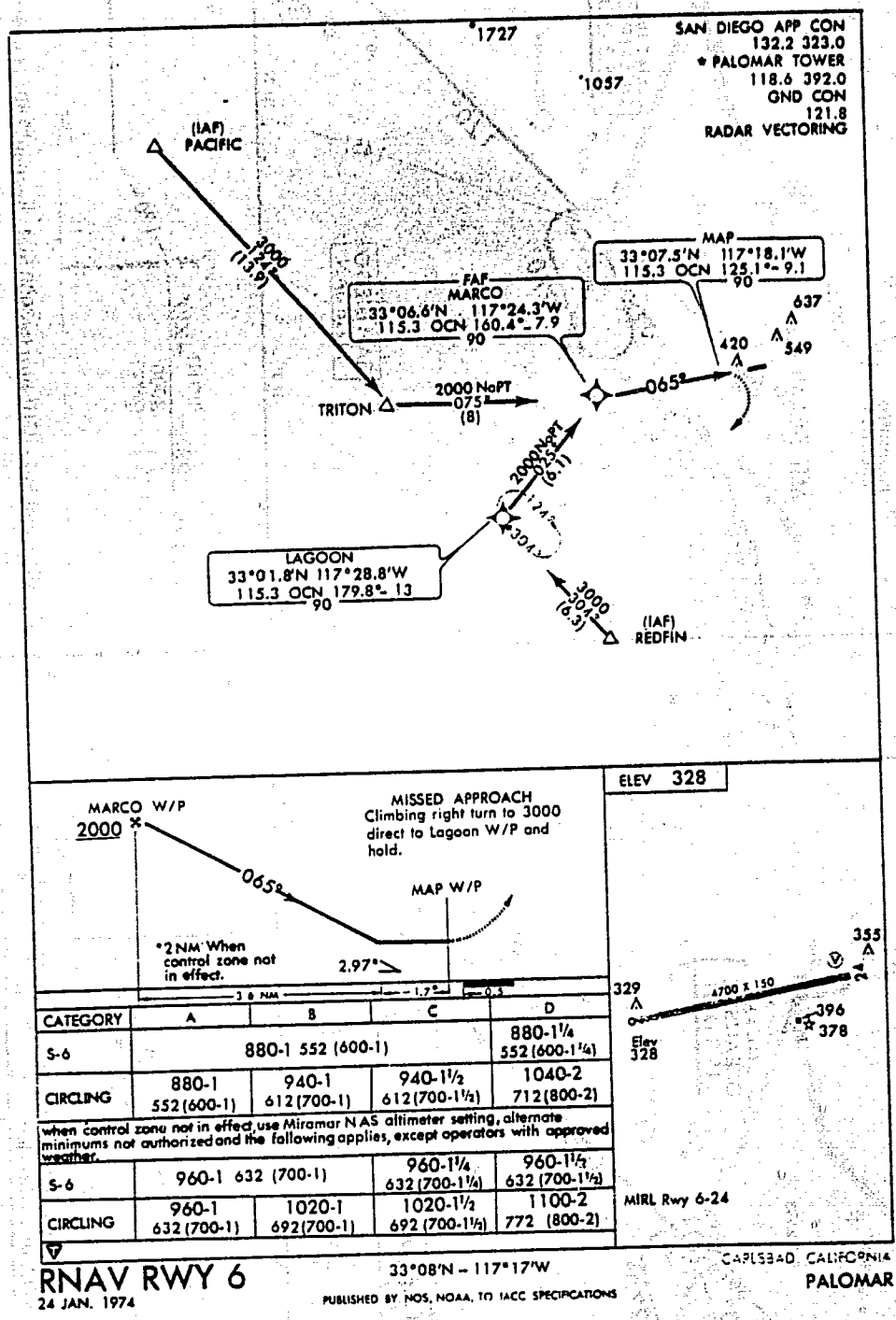


PULL UP: Climbing RIGHT turn to 3000 feet, heading 180° to intercept outbound OCN VOR R-145 direct SAN VOR, or as directed.

	CIRCLE-TO-LAND	
	Control Zone Effective or With Approved Weather Service MDA	With Miramar NAS Altimeter Setting MDA
A	980'(652')-1	1060'(732')-1
B	980'(652')-1½	1060'(732')-1½
C	1040'(712')-2	1100'(772')-2
D & J Eng Jet		

Gnd speed-Kts	60	80	100	120	140	160

Figure 11.21



CATEGORY	A	B	C	D
S-6	880-1 552 (600-1)			880-1¼ 552 (600-1¼)
CIRCLING	880-1 552 (600-1)	940-1 612 (700-1)	940-1½ 612 (700-1½)	1040-2 712 (800-2)

when control zone not in effect, use Miramar NAS altimeter setting, alternate minimums not authorized and the following applies, except operators with approved weather.

S-6	960-1 632 (700-1)		960-1¼ 632 (700-1¼)	960-1½ 632 (700-1½)
CIRCLING	960-1 632 (700-1)	1020-1 692 (700-1)	1020-1½ 692 (700-1½)	1100-2 772 (800-2)

RNAV RWY 6

24 JAN. 1974

33°08'N – 117°17'W

PUBLISHED BY NOS, NOAA, TO IACC SPECIFICATIONS

CARLSBAD, CALIFORNIA

PALOMAR

Figure II.22

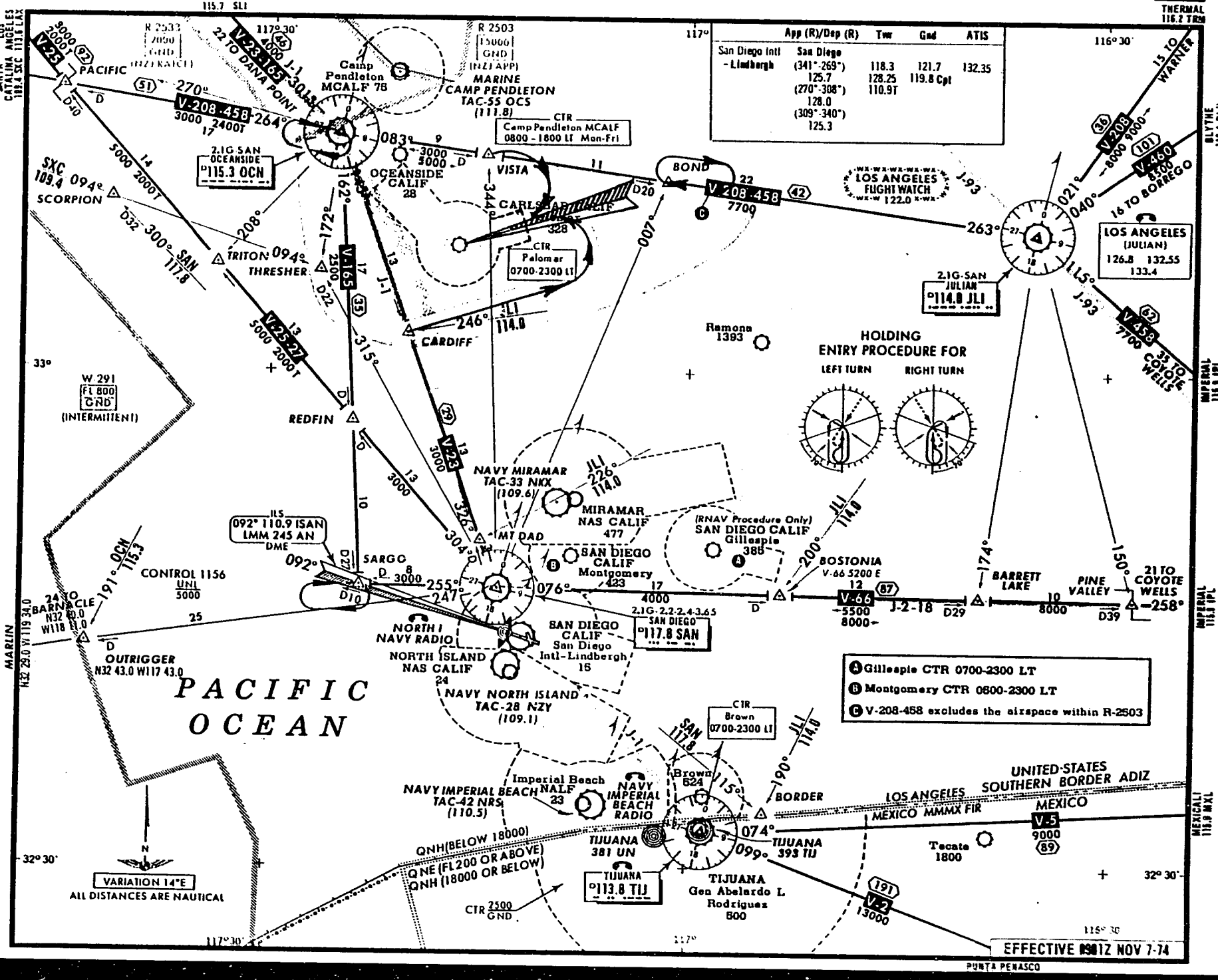

App (R)/Dep (R) Twr Gnd ATIS
San Diego Intl - Lindbergh
San Diego (341°-269°) 125.7 (270°-308°) 128.0 (309°-340°) 125.3
118.3 128.25 110.9T
121.7 119.8 Cpt
132.35
PACIFIC
SCORPION
TRITON
THRESHER
REDFIN
CARDIFF
VISTA
OCEANSIDE CALIF
Camp Pendleton MCALF 76
MARINE CAMP PENDLETON TAC-55 OCS (111.8)
CTR Camp Pendleton MCALF 0800-1800 LT Mon-Fri
CTR Palomar 0700-2300 LT
BOND
LOS ANGELES FLIGHT WATCH
LOS ANGELES (JULIAN)
HOLDING ENTRY PROCEDURE FOR
LEFT TURN
RIGHT TURN
Ramona 1393
NAVY MIRAMAR TAC-33 NKX (109.6)
MIRAMAR NAS CALIF 477
SAN DIEGO CALIF Montgomery 423
SAN DIEGO CALIF Gillespie 388
(RNAV Procedure Only)
SAN DIEGO CALIF San Diego Intl-Lindbergh 16
BOSTONIA
BARRETT LAKE
PINE VALLEY
SARGO
CONTROL 1156 UNL 5000
OUTRIGGER N32 43.0 W117 43.0
BARN N32 28.0 W118 24.0
NORTH ISLAND NAS CALIF
NAVY NORTH ISLAND TAC-28 NZY (109.1)
NORTH I NAVY RADIO
NAVY IMPERIAL BEACH TAC-42 NRS (110.5)
Imperial Beach NALF 23
NAVY IMPERIAL BEACH RADIO
Brown 624
CTR Brown 0700-2300 LT
TIJUANA 381 UN
TIJUANA 393 TIJ
TIJUANA Gen Abelardo L Rodriguez 500
Tecate 1800
BORDER
LOS ANGELES MEXICO MMMX FIR
UNITED STATES SOUTHERN BORDER ADIZ
MEXICO
W 291 FL 800 GND (INTERMITTENT)
ILS 092° 110.9 ISAN LMM 245 AN DME
2.1G SAN OCEANSIDE 115.3 OCN
2.1G SAN JULIAN 114.0 JLI
2.1G SAN DIEGO 117.8 SAN
A Gillespie CTR 0700-2300 LT
B Montgomery CTR 0600-2300 LT
C V-208-458 excludes the airspace within R-2503
VARIATION 14°E
ALL DISTANCES ARE NAUTICAL
QNH(BELOW 18000)
QNE (FL200 OR ABOVE)
QNH (18000 OR BELOW)
CTR 2500 GND
1" = 7.5 NM STATUTE NAUTICAL
PACIFIC OCEAN
EFFECTIVE 0901Z NOV 7-74

Figure 11.23

and will then be radar vectored onto the localizer. Cardiff Intersection will be used as the initial fix for radar vector to the ILS for inbound traffic from the south.

The ILS installation does not include back-course capability; hence, the VOR approaches will be used for landings when necessary on Runway 6R.

These new procedures are particularly helpful to the community compatibility since the present procedures force aircraft to traverse the distance from the Oceanside VOR to the airport without the aid of altitude information which results in more noise than is expected with the ILS procedure. The modified Airport Data Sheet shown in Figure II. 24 reflects the changes resulting from the new runway and the addition of the ILS and other navigational aids.

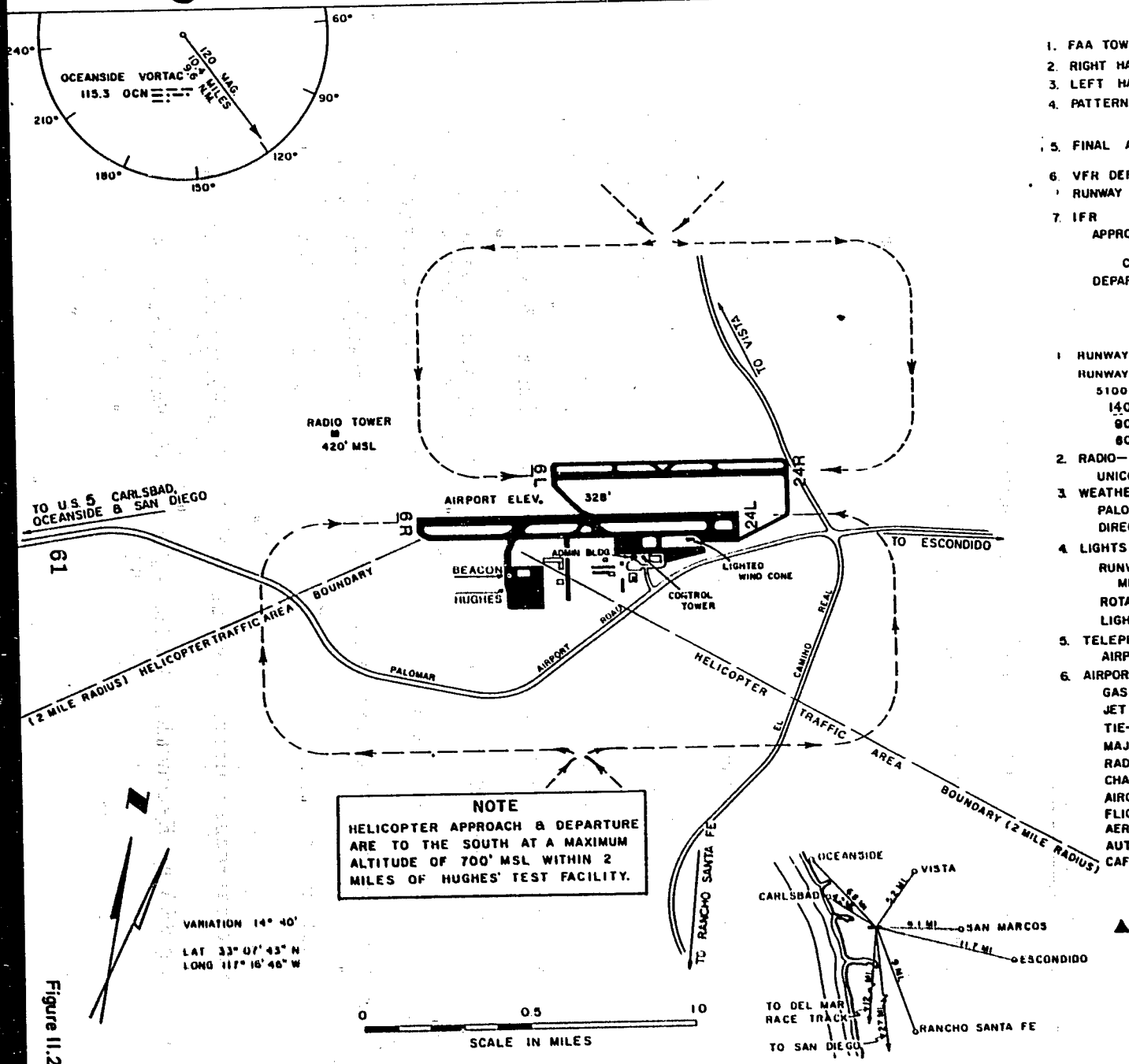


Figure 11.24

PALOMAR TRAFFIC PATTERNS

1. FAA TOWER CONTROLLED AIRPORT FROM 0700 AM TO 1100 PM
2. RIGHT HAND PATTERN FOR RUNWAY 24R & 6R
3. LEFT HAND PATTERN FOR RUNWAY 6L & 24L
4. PATTERN ALTITUDES 1000' MSL - RECIPROCATING AIRCRAFT
   1500' MSL - JET AIRCRAFT
5. FINAL APPROACH TO BE STRAIGHT IN FOR LAST 1000 FT.
6. VFR DEPARTURES – STRAIGHT OUT UNTIL CLEAR OF END OF RUNWAY AND 700' MSL., EXCEPT JETS CLEAR OF COASTLINE.
7. IFR
   APPROACH – ILS RUNWAY 24L (PRECISION)
   – VIA 120° RADIAL OCN VORTAC (NON PRECISION)
   CALL SAN DIEGO APPROACH CONTROL 132.2 MHZ
   DEPARTURE – CALL PALOMAR GROUND CONTROL 121.8 MHZ
   OR UNICOM 123.0 MHZ

FACILITIES

1. RUNWAY 6L/24R ··· 3600 FT. LONG, 75 FT. WIDE ·· 12,500 LBS. GROSS WEIGHT
   RUNWAY 6R/24L
   5100 FT. LONG, 150 FT. WIDE, DESIGNED FOR:
   140,000 LBS. GROSS AIRCRAFT WEIGHT WITH DUAL TANDEM WHEEL GEAR.
   90,000 LBS. GROSS AIRCRAFT WEIGHT WITH DUAL WHEEL GEAR.
   60,000 LBS. GROSS AIRCRAFT WEIGHT WITH SINGLE WHEEL GEAR.
2. RADIO – CONTROL TOWER 118.6 MHZ GROUND CONTROL 121.8 MHZ
   UNICOM 123.0 MHZ 24 HOURS
3. WEATHER–FLIGHT PLANS
   PALOMAR AIRPORT ("CRQ" SEQUENCE CODE)
   DIRECT PHONE LINE TO F.A.A. FLIGHT SERVICE STATION, SAN DIEGO.
4. LIGHTS
   RUNWAYS 6R/24L-6L/24R AND TAXIWAYS
   MEDIUM INTENSITY, SUNSET TO SUNRISE, STROBES-24L.
   ROTATING BEACON
   LIGHTED WIND CONE
5. TELEPHONE
   AIRPORT OFFICE 729-7155 CONTROL TOWER 729-4969
6. AIRPORT SERVICE
   GAS (80–87, 100–130 OCTANE) & OIL.
   JET FUEL (F 30)
   TIE-DOWN & HANGAR STORAGE
   MAJOR AIRCRAFT & ENGINE REPAIR
   RADIO SALES & SERVICE
   CHARTER SERVICE
   AIRCRAFT RENTAL
   FLIGHT & GROUND SCHOOLS
   AERIAL CROP DUSTING
   AUTOMOBILE RENTAL
   CAFE

▲ Revised pursuant to Master Plan

SAN DIEGO COUNTY CALIFORNIA
DEPARTMENT OF PUBLIC WORKS

PALOMAR AIRPORT DATA SHEET

MANAGER, LOVELL HURLBUT NOV 1974

FORECAST OF DEMAND (130)

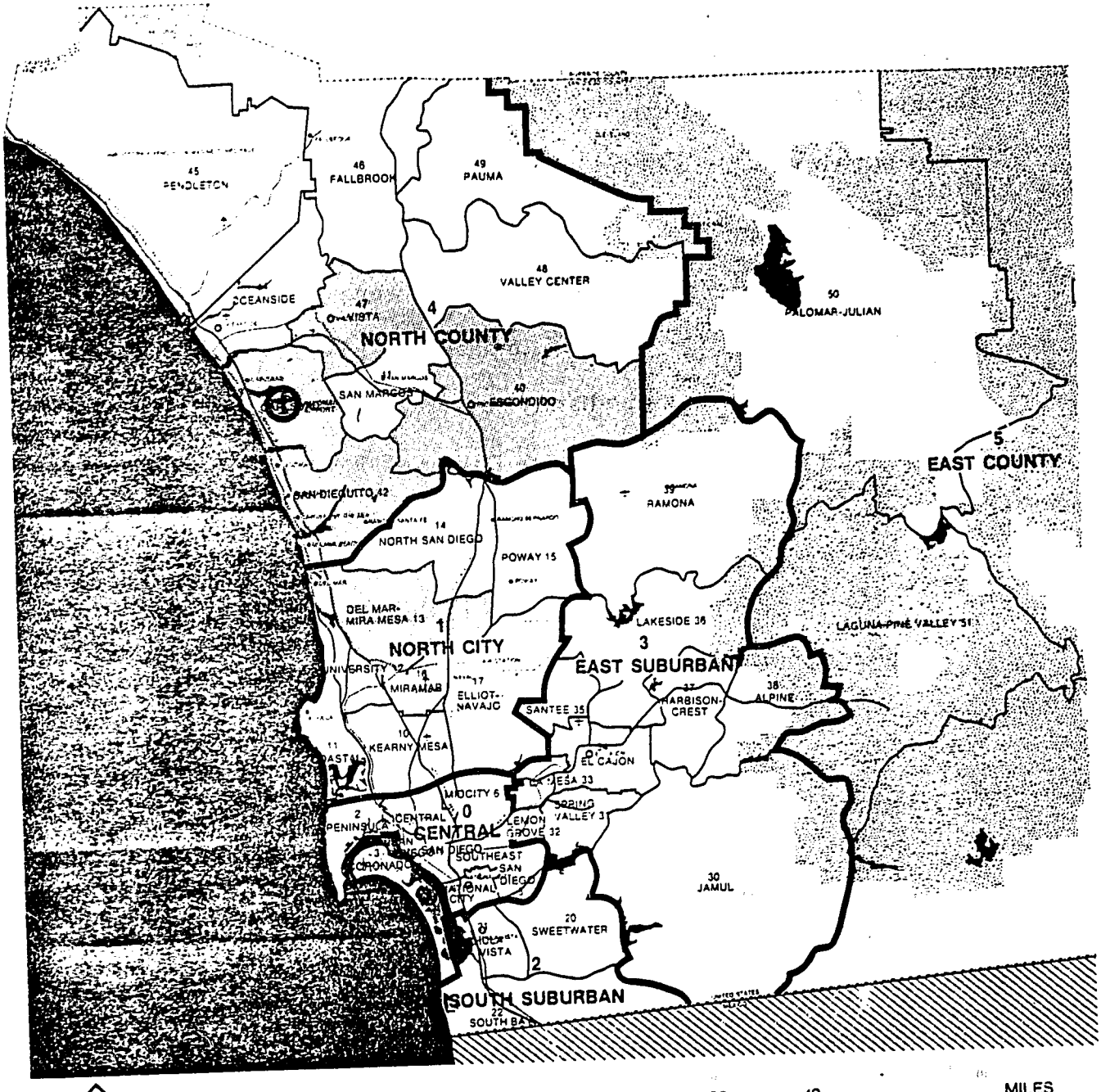
The demand forecasts in the following paragraphs are based on current activity and available demographic data reflecting the anticipated growth in the area. Data reflecting trends throughout San Diego County were obtained from the Comprehensive Planning Organization (CPO).

Based Aircraft

A careful inventory of aircraft presently based at Palomar Airport was conducted to establish an accurate base from which to project future demand. From contacts with fixed based operators and discussions with County officials, it was determined that approximately 191 aircraft were located at Palomar in the 1973 base year. This count included 31 helicopters located at the Hughes facility.

The inventory list was examined and each aircraft was assigned to a Sub-regional Area. These SRA's are comprised of groups of 1970 census tracts which are aggregated in terms of community boundaries. The SRA's were chosen as the forecasting denominator because they are currently used for county population forecasts and are of appropriate size to provide a meaningful regional general aviation forecast.

Palomar-based aircraft owners were found to reside in the following SRA's: Escondido, Del Mar-Mira Mesa, San Marcos, San



Subregional Areas

Figure II.25

Dieguito, Oceanside, Carlsbad, Coastal, Vista, Valley Center and Pendleton. In addition, several based aircraft owners reside in one of five SRA's in San Diego City. These aircraft were combined and forecast as a single San Diego group. Based aircraft owners residing outside of San Diego County were also forecasted separately. As would be expected, most of the based aircraft owners reside in SRA's immediately surrounding the Palomar Airport. Particularly important are Del Mar-Mira Mesa, Escondido, San Dieguito, Vista and Carlsbad. (See Figure II. 25)

Based on the number of aircraft owners residing in each SRA and the current population of the SRA, a factor for the number of aircraft per 1,000 population was calculated for each designated SRA.

Utilizing the countywide population forecast contained in the first SANPAT Interim Report and the county general aviation forecast (Alternate B) contained in the fourth SANPAT Interim Report, a second set of factors, based on the number of aircraft per 1,000 population, was obtained for San Diego County for the years 1973, 1975, 1980 and 1990.

Table 5

GENERAL AVIATION AIRCRAFT
BASED IN SAN DIEGO COUNTY

	1972	1973	1975	1980	1990
Population (000) [1]	1470	1502	1570	1791	2253
San Diego County Based A/C	1300	1352	1412	1736	2849

1. SANPAT Interim Report 1, Volume 3

Compiled by: Mitchell Research Associates

The computed resulting percentage increase in the number of county aircraft per 1,000 population, for each of the years indicated, was applied to the factors developed earlier for each of the designated SRA's. Upon the completion of this step, factors were obtained that could be utilized to determine the number of based aircraft per 1,000 population for each SRA for the years 1975, 1980 and 1990. These factors were then applied to the CPO population forecasts for each SRA to obtain the projected number of Palomar based aircraft owned by residents of the SRA's for the years 1975, 1980, and 1990. (See Table 6)

Eleven of the owners identified their place of residence as being in either Riverside, Orange or Los Angeles Counties. These aircraft were forecast to increase during the study period as a direct function of the population increase anticipated in each county and related to

the San Diego County increase in aircraft per 1,000 population. It was assumed that the demand for FBO aircraft utilized for instruction, rental and charter would increase proportionally with based aircraft and the increased airport activity. Consequently, the number of FBO aircraft and helicopters were forecast to increase during the study period by the same percentage as private based aircraft at Palomar. The total number of private aircraft, FBO aircraft and helicopters forecast to be based at Palomar during the study period is shown in Figure II.26.

Table 6

GENERAL AVIATION AIRCRAFT
BASED AT PALOMAR AIRPORT

Owner Residence	Aircraft/1000 Population				Based Aircraft			
	1973	1975	1980	1990	1973	1975	1980	1990
Escondido	.51	.53	.66	1.05	29	32	45	95
Del Mar -M. M.	2.04	2.11	2.62	4.17	9	10	12	20
San Marcos	.31	.33	.40	.64	3	4	8	24
San Dieguito	.55	.571	.708	1.128	17	19	28	61
Oceanside	.23	.24	.29	.47	11	12	16	31
Carlsbad	.57	.59	.73	1.17	12	13	28	94
Coastal	.19	.20	.25	.39	5	5	7	12
Vista	.43	.45	.56	.88	14	15	20	39
Valley Center	.27	.28	.34	.55	1	1	2	6
Pendleton	.03	.03	.04	.06	1	1	1	2
San Diego	.01	.02	.02	.03	6	6	9	18
Outside San Diego Co.	.001	.001	.001	.002	11	13	17	31
FBO					41	45	66	149
Helicopters					31	31	31	31
TOTAL					191	207	290	613

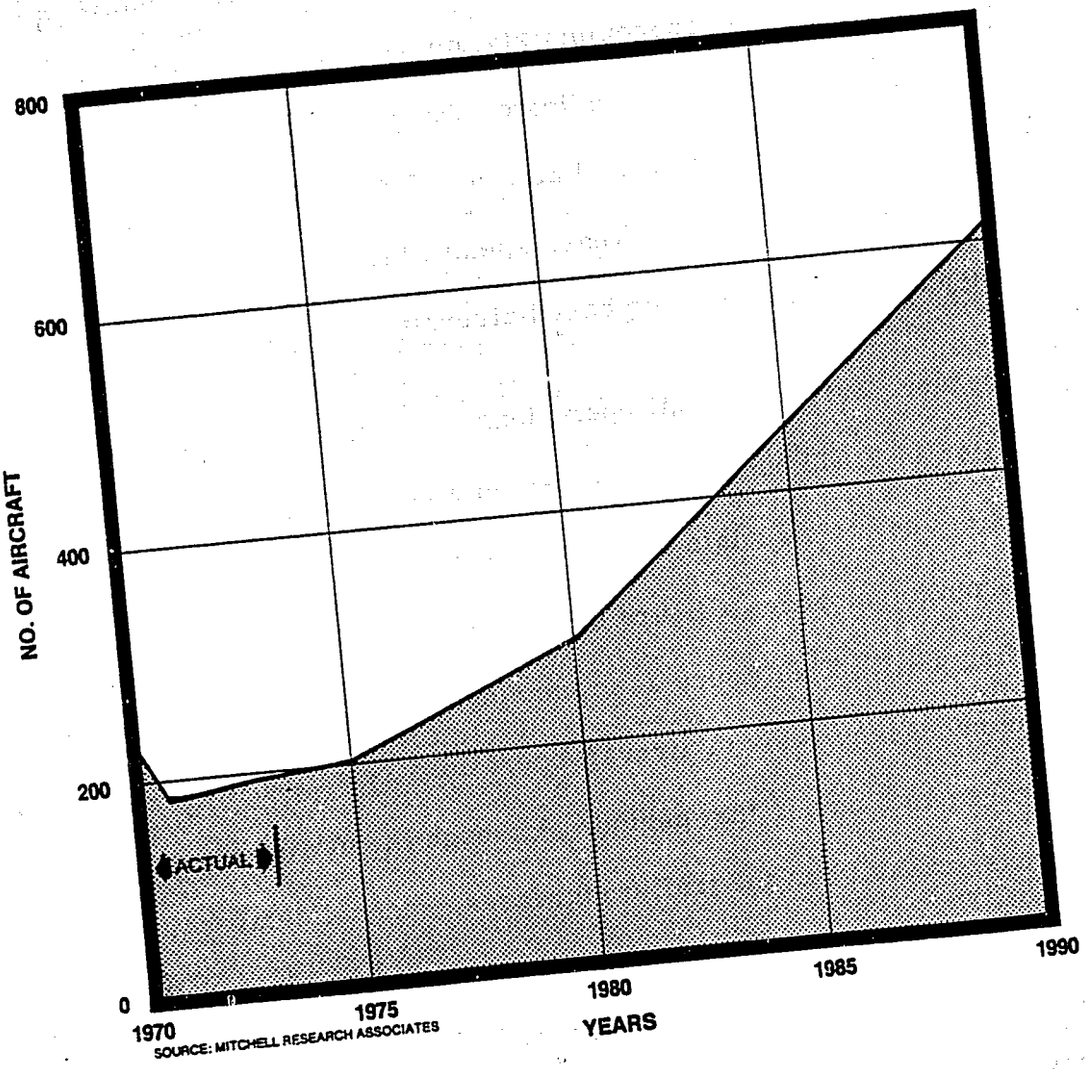


Figure II.26

Demand Forecast Based Aircraft

Annual Operations

The fourth SANPAT Interim Report indicates that the number of annual general aviation operations per based aircraft in San Diego County has remained approximately the same during years 1971 and 1972. The report also indicates that the countywide number of annual operations per based aircraft was at 960 in 1972. They forecast an increase in the years ahead which will ultimately reach 1,000 annual operations per based aircraft by 1990.

There were 201,000 annual operations at Palomar in 1973 which resulted in 1,052 operations per based aircraft in that year. This basis is used to calculate operations demand until 1980, at which time for planning purposes a figure of 890 operations per based aircraft is being used. This figure as a planning tool is being reduced due to the necessary delay to aircraft operations resulting from airfield improvements during that period. Although the new runway will increase capacity as the traffic increases, general delays will cause a further reduction in the 1990 time frame to approximately 650 operations per based aircraft. Figure II. 27 illustrates four different projections of the total number of annual operations forecast to occur at Palomar during the study period.

Aircraft Mix

The current and projected aircraft operations mix is indicated in Table 7. The figures are based on discussions with FAA tower personnel and field observations at Palomar. Future projections assume that the required facilities to support the demand will be made available. It should be noted that business jet traffic represents a very low portion of the total.

Table 7

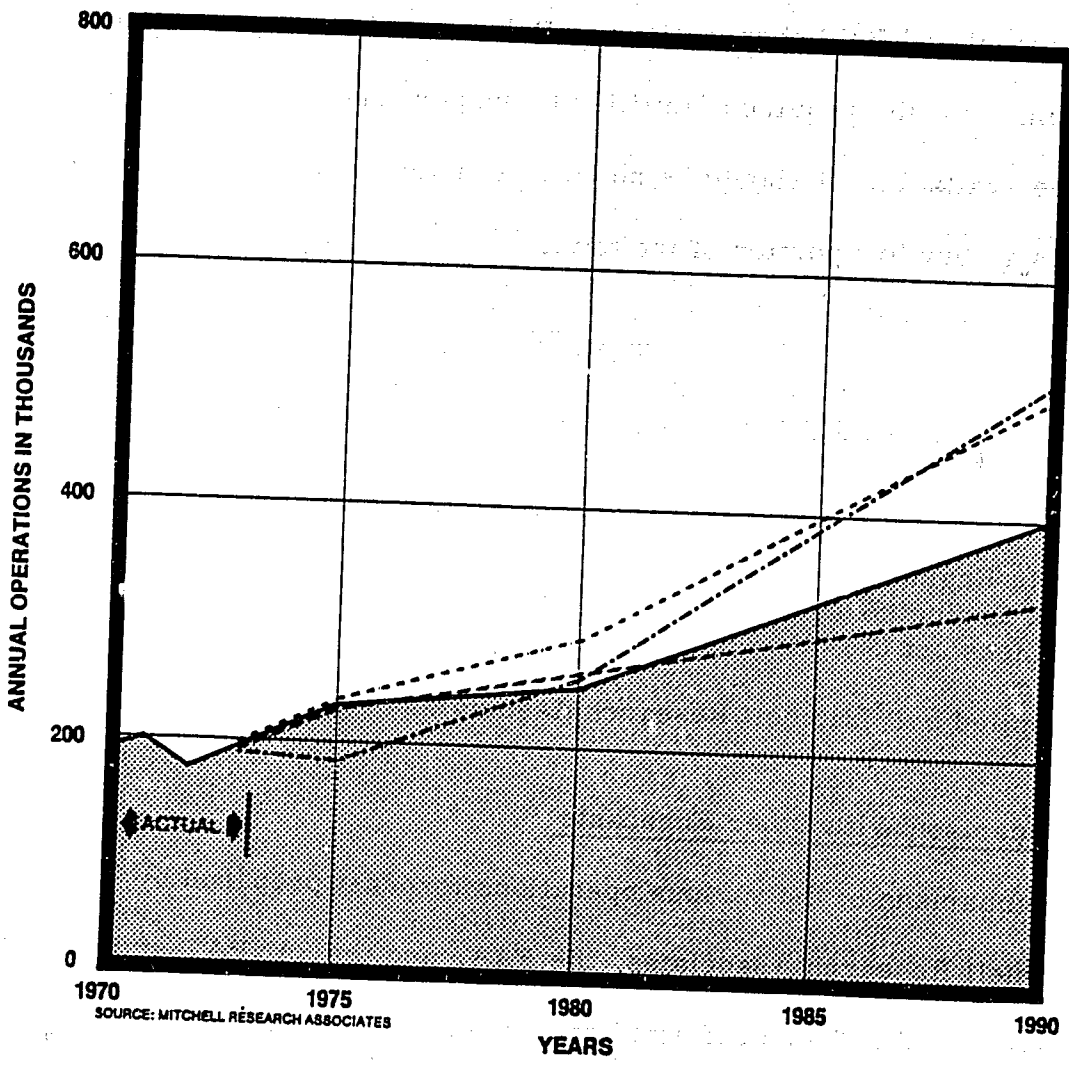
AIRCRAFT OPERATIONS MIX PROJECTIONS

	1973	1975	1980	1990
Single Engine (%)	80	80	79	75
Twin Engine (%)	19	19	19	22
Business Jet (%)	1	1	2	3

Compiled by: Mitchell Research Associates

Comparison With Other Forecasts

A comparison of the various operations forecast prepared by Mitchell Research Associates, the FAA, and the SANPAT study shown in Table 8 are reflected graphically in Figure II. 27.



Demand Forecast Annual Operations (000)

Figure II.27

Table 8

PALOMAR AIRPORT
COMPARISON OF OPERATIONS FORECASTS
(Thousands)

	1972	1973	1975	1980	1985	1990
This Forecast (Constrained)	182(A)	201(A)	232	259		402
This Forecast (Unconstrained)			232	290		500
FAA [1] - FY			228		300	
SANPAT [2]			193	267		511

1. FAA Memorandum, October, 1973
2. SANPAT, Interim Technical Report 4, Vol. II, April 1973
(A) is actual

Compiled by: Mitchell Research Associates

The FAA forecasts are based on a fiscal year, and should be compared from the chart Figure II.27. Several projections have been included to give an indication of the range that exists between the various forecasters.

The forecast obtained from the SANPAT study is but one of a number in the study. The "alternate" forecast shown is based on figures which suggest a lower demand for general aviation services in the San Diego metropolitan region than their other forecasts.

DEMAND/CAPACITY ANALYSIS (131)

The Palomar demand forecast anticipates the continued growth of general aviation. As the number of people living in the northern portion of the country increases, demand for general aviation service at Palomar will increase.

Table 9

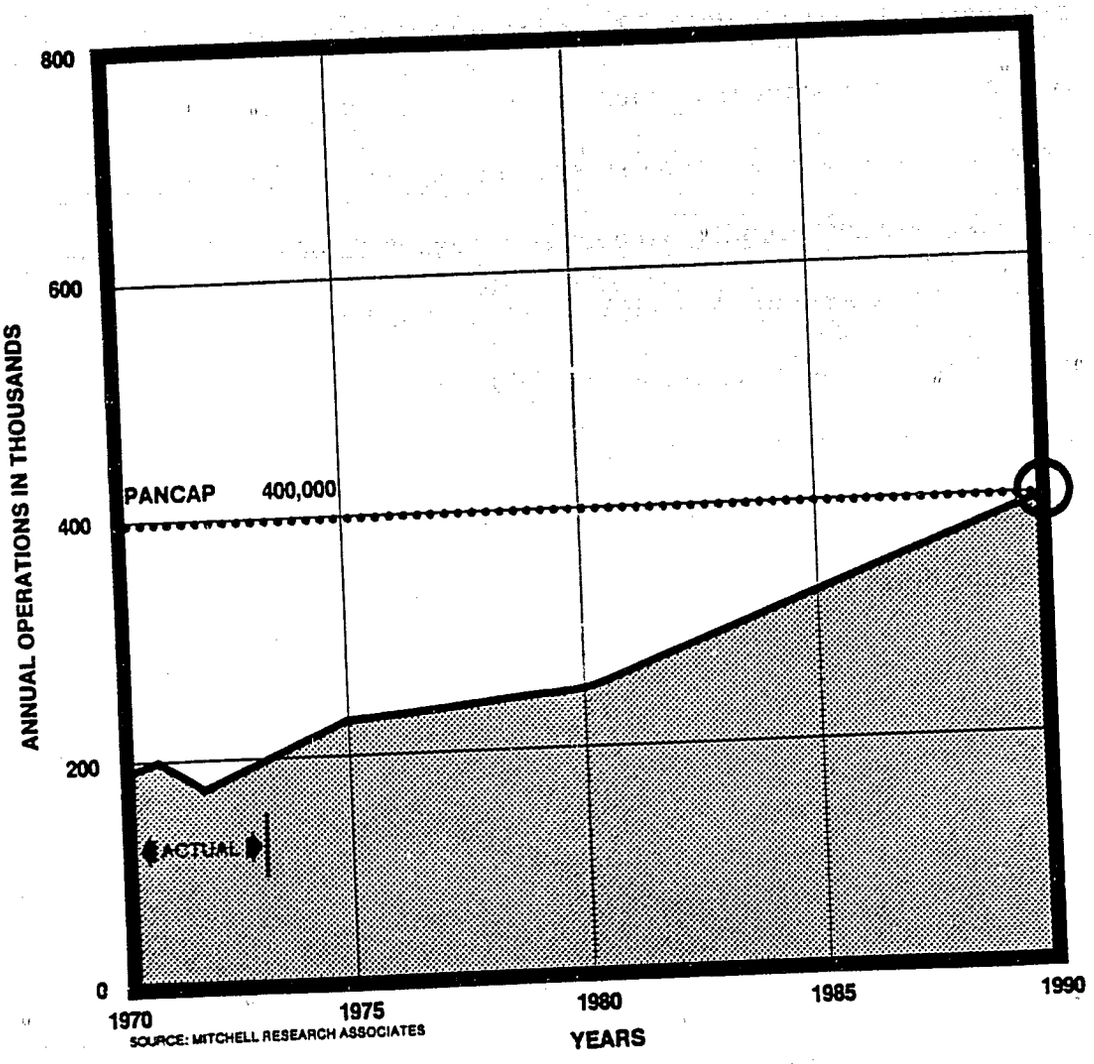
PALOMAR OPERATIONS
DEMAND/CAPACITY
(Probable)

	1973	1975	1980	1990
Local Operations (% of Total)	74%	73%	70%	65%
Current PANCAP (000)[1]	235	230	225	220
Forecast Demand (000)		232	259	402
PANCAP with second runway (000)		425	420	400
PANCAP with third runway (000)[2]				880

1. PANCAP from SANPAT "Interim Report 1, Volume 4"
2. PANCAP from SANPAT "Interim Report 4, Volume 2"

Compiled by: Mitchell Research Associates

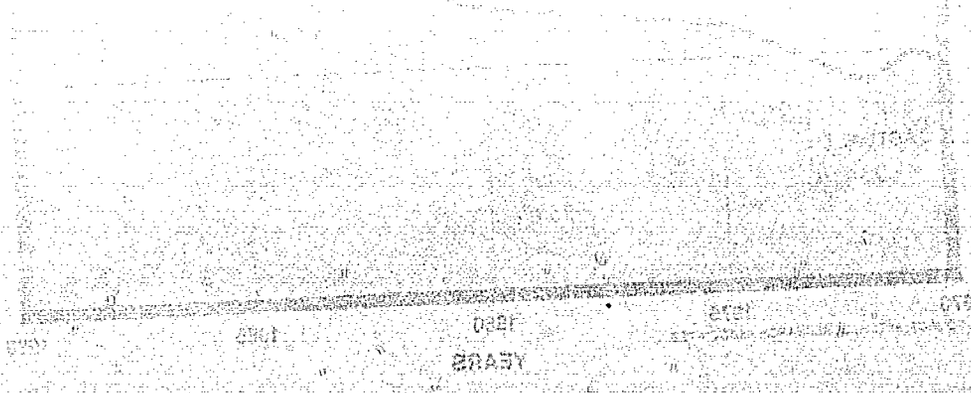
As indicated in Table 9, the projected Practical Annual Capacity (PANCAP) will remain relatively stable, assuming that runways at Palomar are not added. When the demand forecast is compared with the PANCAP, it shows that the demand is not expected to exceed the PANCAP until 1990. (See Figure II. 28)



Demand/Capacity

Figure II.28

If a third parallel runway could be constructed, the PANCAP could increase substantially to 880,000 operations, however, examination of the terrain, the cost and the noise impacts indicate that this alternative is not feasible. Because PANCAP is a theoretical value, it represents a standard which is very often exceeded. When it is exceeded, users of the runway system experience delays at peak periods. Orange County Airport is an example of such an airport where with two runways its PANCAP is 400,000 operations and yet in 1973 actual traffic exceeded 600,000 operations. The reason for the excess is simply because demand is great and there are no other facilities to accommodate the traffic. The user is willing to accept delays rather than to move to more remote locations.



FACILITY REQUIREMENTS (132)

The demand/capacity analysis at Palomar Airport shows that the capacity of the present runway will be exceeded in 1977. The addition of a second runway will provide capacity to 1990. Clearly, the second runway is needed; however, the unknowns associated with long range forecasting and the restraints presented by economic fluctuations, environmental considerations and costs associated with the topography of the site do not warrant planning for a third runway. The Master Plan was therefore developed based on a two parallel runway system.

Although the future will undoubtedly require short-haul air service at Palomar, the timing and extent of service is uncertain since it is dependent not only on need but on community acceptance and on the aviation system alternate eventually adopted for the County of San Diego. The obvious approach to a Master Plan for Palomar Airport, therefore, is to plan for a General Aviation airport. Analysis shows that forecast operations would be approximately 1,000,000 annual passengers by 1990, (considerably less than the amounts presented in SANPAT for those alternates that would contemplate major use of Palomar) and air carrier service would require only a fraction of the airport's operational capacity.

Short-haul operations could be accommodated if the runways are of adequate length or if short take-off and landing aircraft are utilized.

For use by today's air carrier aircraft, the length of the existing runway should be extended to about 6,000 feet. It is proposed that, due to economic constraints of the topography, the runway length be limited to 5,100 feet. Air carriers using the airport would have to operate from this runway if service is instituted.

Runways

The aircraft presently using Palomar include a significant number of twin-engine piston airplanes and executive jets and by 1990 they will represent one-fourth of the aircraft at Palomar. Airplanes in this category have gross weights up to 60,000 pounds and will, therefore, require a "basic transport" runway. The existing 4,700 foot runway extended 400 feet on the east, develops a physical length of 5,100 feet, which meets the "basic transport" criteria for 100 percent of the fleet at 60 percent useful load as indicated in Table 10. A large part of Palomar's users can, however, operate from a runway in the "general utility" classification with a required length of 3,600 feet as shown in the table. The runway lengths and widths for the classifications shown in the table reflect

TABLE 10

RUNWAY-TAXIWAY CONFIGURATIONS (PALOMAR)

Basic Transport Dimensions - Precision Instrument Runway
(Ref: FAA Advisory Circular 150-5300-6)

Runway Length - Corrected for Temperature (75°) and Elevation (328 ft.) and Gradient (.18%)(Figs. 5, 6, & 7)	
60% of fleet, 60% of useful load	4,700 feet
100% of fleet, 60% of useful load	5,100 feet
Runway Width	150 feet
Runway Safety Area	500 feet
Taxiway Width	40 feet
Spacing of Runways and Taxiways	
Runway centerline to:	
Taxiway centerline	400 feet
Building Restriction Line (taxiway side)	750 feet
Aircraft Parking Area	650 feet
Taxiway centerline to:	
Aircraft tie-down area	250 feet
Fixed or movable object	200 feet
Centerline of parallel taxiway	300 feet
Building Restriction Line	200 feet

General Utility Runway Dimensions
(Ref: FAA Advisory Circular 150-5300-4A)

Runway Length - Corrected for Temperature (75°) and Elevation (328 ft.) (Fig. 6)	3,550 feet
Runway Width	75 feet
Runway Safety Area	200 feet
Taxiway Width	40 feet
Spacing of Runways and Taxiways	
Runway centerline to:	
Taxiway centerline	200 feet
Property Line	250 feet
Building Restriction Line (taxiway side)	300 feet
Taxiway centerline to:	
Aircraft tie-down area	75 feet
Fixed or movable object	50 feet

the requirements for a "basic transport precision runway" and a "general utility visual runway" corrected for temperature and elevation and effective runway gradient.

The existing runway at Palomar will accommodate sixty percent of the fleet at sixty percent useful load; however, extension of this runway is recommended in the plan in order to increase its flexibility, capability and safety.

There have been some complaints about the profile of the runway at Palomar due to the dip in the middle. The runway could be improved by filling the center half of the runway length to a depth of about 5 feet at the midpoint with the result that the 1.0 and 1.2 percent grades would be cut in half, the vertical curve lengths would then meet the requirements of Advisory Circular 150/5325-2B for certified air carrier service and the runway gradient would be reduced from .31% to approximately .18%. The Master Plan consequently contemplates this fill in the development. Grooving should be considered on the uphill west end of the runway for the immediate future until the grades are reduced.

Approach and clear zone dimensions are shown in Table 11. for the applicable runway and approach classifications. The existing runway falls into the "Larger than Utility" classification

TABLE 11

APPROACH AND CLEAR ZONE DIMENSIONS (PALOMAR)
(Ref: FAR Part 77, AC 150/5190-3A and AC 150-5300-4A)

Precision Instrument Runway - Runway 24L

Primary Surface Width		1,000 feet
Clear Zone Width		
Start		1,000 feet
End		1,750 feet
Clear Zone Length		2,500 feet
Approach Zone		
Slope	50:1 for	10,000 feet
	40:1 for next	40,000 feet
Width at End		16,000 feet
Length		50,000 feet

Non-Precision Instrument Runway - Runway 6R

Primary Surface Width		1,000 feet
Clear Zone Width		
Start		1,000 feet
End		1,500 feet
Clear Zone Length		1,700 feet
Approach Zone - Minimums as low as 3/4 mile		
Slope	34:1	
Width at End		4,000 feet
Length		10,000 feet

General Utility Runway - Visual - Runway 6L/24R

Primary Surface Width		250 feet
Clear Zone Width		
Start		250 feet
End		450 feet
Length		1,000 feet
Approach Zone		
Slope	20:1	
Width at End		1,250 feet
Length		5,000 feet

and installation of an ILS results in a precision instrument approach from the east and a non-precision approach from the west. The second runway will be classed as "Utility-Visual".

Taxiways

Widths and clearances for taxiways are shown for the two runways classified in Table 10. It should be noted that the existing taxiway and the existing runway to Building Restriction Line (BRL) dimensions do not meet the requirements for a precision instrument runway. Meeting these requirements would necessitate the relocation of the runway and taxiway or many existing structures. The projected use of the airport does not warrant these expenditures and the plan contemplates that the FAA can reasonably grant a variance to accommodate these existing conditions. The Building Restriction Line is 625.5 feet from the runway centerline versus a requirement of 750 feet and the taxiway spacing is 267.5 feet versus a requirement of 400 feet.

Although the topography of the site dictates that the second runway be located 1,850 feet north of the existing runway, the property constraint will not allow more than 700 feet. Consideration of capacity and runway access indicate that it should be a parallel runway with a taxiway connector between the two runways.

A two-way 75 foot (non-standard) taxiway connector is planned to serve that purpose. A parallel taxiway north of the new runway will be 40 feet wide, designed for aircraft of 12,500 pounds gross weight and it will be constructed at the same time as the added runway.

High speed turnoffs will be included on the new runway to increase its capacity.

Phasing

Construction staging should consider the requirements for land purchase for the second runway, grading and runway construction time and the need to keep at least one of the runways in operation at all times. The plan therefore provides for land acquisition generally in the 1974-1975 time frame, the construction of the second runway and associated taxiways in the 1976-1980 period and the extension of and reconstruction of the existing runway in the 1980-1990 period. This sequence of development provides the flexibility to accommodate the requirements as they develop. During the process, however, runway capability (length and strength for large twins and jets) and capacity will be exceeded during work on the existing runway.

Terminal Area

Terminal area requirements are based on air taxi and commuter service only. The present administration building will therefore serve as the terminal during the time frame of this study. If additional space is required, the present administration building can be expanded westerly to accommodate the need.

This constraint on air carrier service results from public hearings and from the desire of the County to limit the size and operational capability of the airport.

The plan does not provide for air carrier service and should it be needed in the future, this plan will of necessity require updating and revision.

Service and Hangar Areas

Area for fixed based operators is calculated on the forecast for 613 based aircraft at 11 aircraft per acre, whether tied down or in T-hangars with twenty percent added to account for office buildings, shops, auto parking, wash racks, fueling, etc. (Ref. Letter of Feb. 11, 1970 from C. E. Drysdale, FAA to D. K. Speer in reference to Gillespie Field). Additional space must be provided for itinerant aircraft. The FBO area requirements are as follows:

Aircraft tie-down and T-hangar	56 acres
Office Building, shops, etc.	11 acres
Itinerant parking	16 acres
Total	83 acres

A fire and rescue facility is also provided.

Heliports

Heliport facilities are included in the plan based on the need to provide for police patrol, air ambulance, search and rescue and public and private transportation services. Preliminary examination of facility requirements indicate the allocation of eight acres to provide for the helipad and service structures.

Obstructions

The planned precision approach to the existing runway requires a 50 to 1 approach surface and this surface is penetrated by a hill approximately one mile to the east of the runway. The three degree glide slope planned for the ILS system, however, requires a 34 to 1 approach slope which is above this hill. The plan shows land acquisition for the 50 to 1 clear zone requirement. Purchase or at least land use control of the hill is a must to insure useful approach minimums.

The San Diego Gas and Electric Company has located a number of main power lines west of the field and is constructing a 383 feet smoke stack at its power plant on the shoreline west of the airport. The stack will be strobe lighted.

Clear zones to the east and west of the existing runway and to both ends of the second runway must be acquired.

Drainage

The location of the second runway on mostly filled ground will require careful engineering to insure proper drainage and control of erosion.

Paving

It is anticipated that flexible pavements consisting of standard surface, base and sub-base courses will be utilized. The extension of the existing runway to the east, however, falls over a sanitary fill area and will require special design and engineering.

Existing runway pavements at Palomar Airport provide strength for 60,000 pounds gross weight (single wheel) and 90,000 pounds gross weight (dual wheel) aircraft. These load bearing capabilities will not be increased until such time as short-haul operations require the use of heavier aircraft.

Lighting and Marking

The existing medium intensity runway lighting system (MIRL) appears sufficient to meet proposed needs. Based on an examination of projected aircraft types, a high intensity lighting system is not required for future use on either the existing runway or the second runway.

The existing taxiway edge lighting system expanded to cover the proposed new taxiways requires no significant modification in the use of omni-directional blue lighting since the ultimate taxiway network will not be one of complex alignments. It should adhere to guidelines in FAA Advisory Circular 150/5340-2B.

Markings for Palomar's runways and taxiways should adhere to the guidelines of Advisory Circular 150/5340-1D; however, significant changes occur in the proposed utilization of displaced threshold marking for the proposed north parallel runway. Marking requirements for the helicopter landing area conform to standards as described in FAA Advisory Circular 150/5390-1A and include primary marking of the landing and takeoff area, guide and position lines and boundary lines. Since the landing area is an integral part of the airport, lighting is restricted to the periphery of the landing and take-off area, the touchdown area and the use of landing direction lights which act in illuminating the desired landing and take-off direction.

Wind Data

Information with respect to Palomar Airport is based upon Palomar weather data 1959-1960 contained in the airport layout plan approved in July 1966. Fifteen mile per hour or less crosswind coverage is equal to 97.98 percent. Wind directions are magnetic and recorded as:

WSW	244°	42'	20"	=	24
ENE	64°	42'	20"	=	6

Approach Aids

The selection of the MALSR system as Palomar's approach lighting system is based on Advisory Circular 150/5300-2C. This system consists of a medium intensity approach lighting system with runway alignment indicator lights. The minimum land requirement for the system includes a 160 feet length by 400 foot width for the approach lighting segment and an additional 1,600 foot length by 25 foot width for the runway alignment indicator lights. These dimensions are measured from the landing threshold and are located symetrically about the extended runway centerline.

The FAA proposes to commission an Instrument Landing System at Palomar Airport between July 1974 and December 1975. The

Western Region of the FAA solicited comments in a document dated March 23, 1973, under Airspace Case No. 73-WE-10-NR. This system is proposed for existing Runway 24 at Palomar with minimums of 200 feet and $\frac{1}{2}$ mile (Category I) with a glide slope at 3 degrees. The glide slope antenna is proposed at 953 feet from the runway threshold; the middle marker 3,800 feet from the glide slope antenna and an outer marker 5 nautical miles from the end of the runway. This precision instrument landing system establishes the requirements for approach surfaces, clear zones and approach lighting as indicated in Table 11.

The use of local airspace to accommodate the ILS is described in Figures II. 22, 23, 24 and 25.

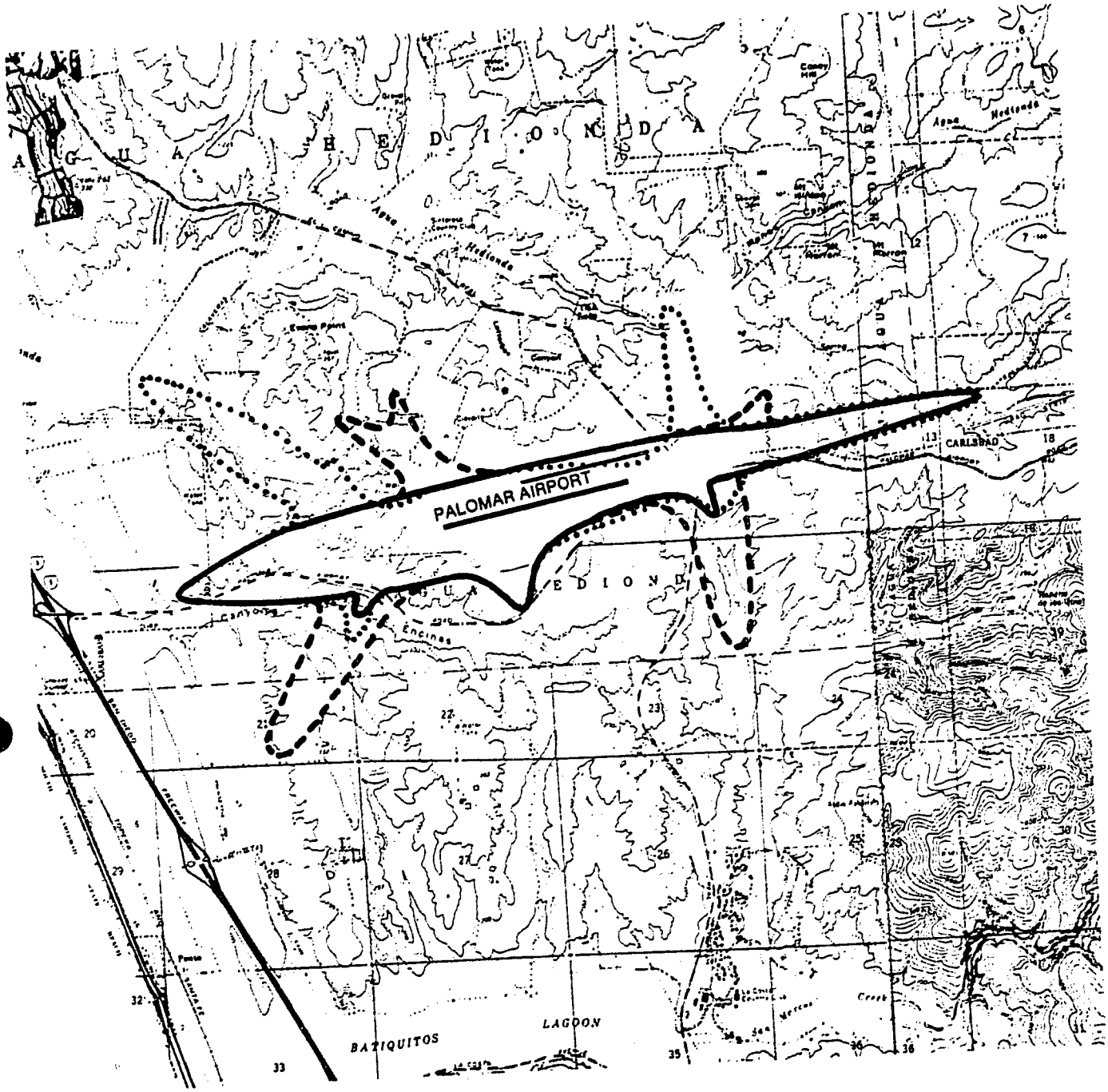
Consideration of VFR aids is also included with proposed addition of a Visual Approach Slope Indicator (VASI) on the new Runway 24R.

Runway End Identifier Lights should be located on Runway 24R to facilitate minimum visibility and night operations.

ENVIRONMENTAL (133)

The complete Environmental Impact Statement for the Palomar Airport Master Plan is presented in Chapter VI, Appendix D.

Figure II. 29 shows the noise contours resulting from the forecast operations at the airport. The contours shown result from the flight paths in use at Palomar (Figure II. 24) and from assumptions that jet noise will be reduced 5-dB in 1980 and 5-dB again in 1990 and propeller noise will be reduced 5-dB in 1990. Under these conditions the 100 CNR noise contour, which outlines the zone within which individuals may complain (perhaps vigorously and with possible concerted group action) would enlarge in 1980 but using the above assumptions would reduce to approximately 1973 size in 1990. Because of the change in instrument approach procedures the 1990 curve is primarily east/west as shown and approximately half of the area is already owned by the airport.



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SCALE - 1" = 4,000'

SOURCE: APPENDIX D

••• 1973/1975

▪▪▪ 1980

▬ 1990 WITH JET LIMITATIONS AND PISTON ENGINE NOISE REDUCTION

Figure II.29

Noise Contours — 100 CNR

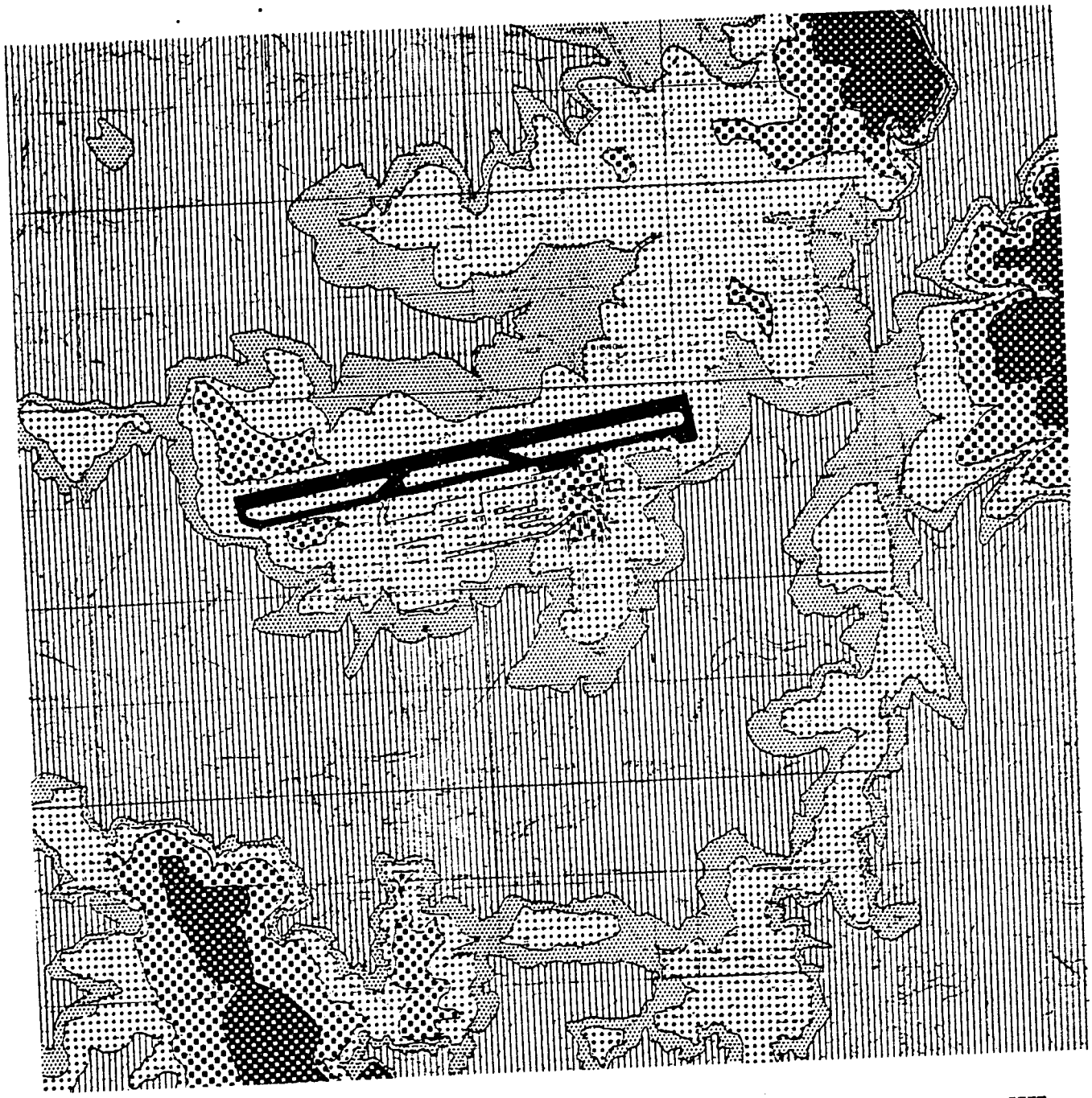


Figure III.1

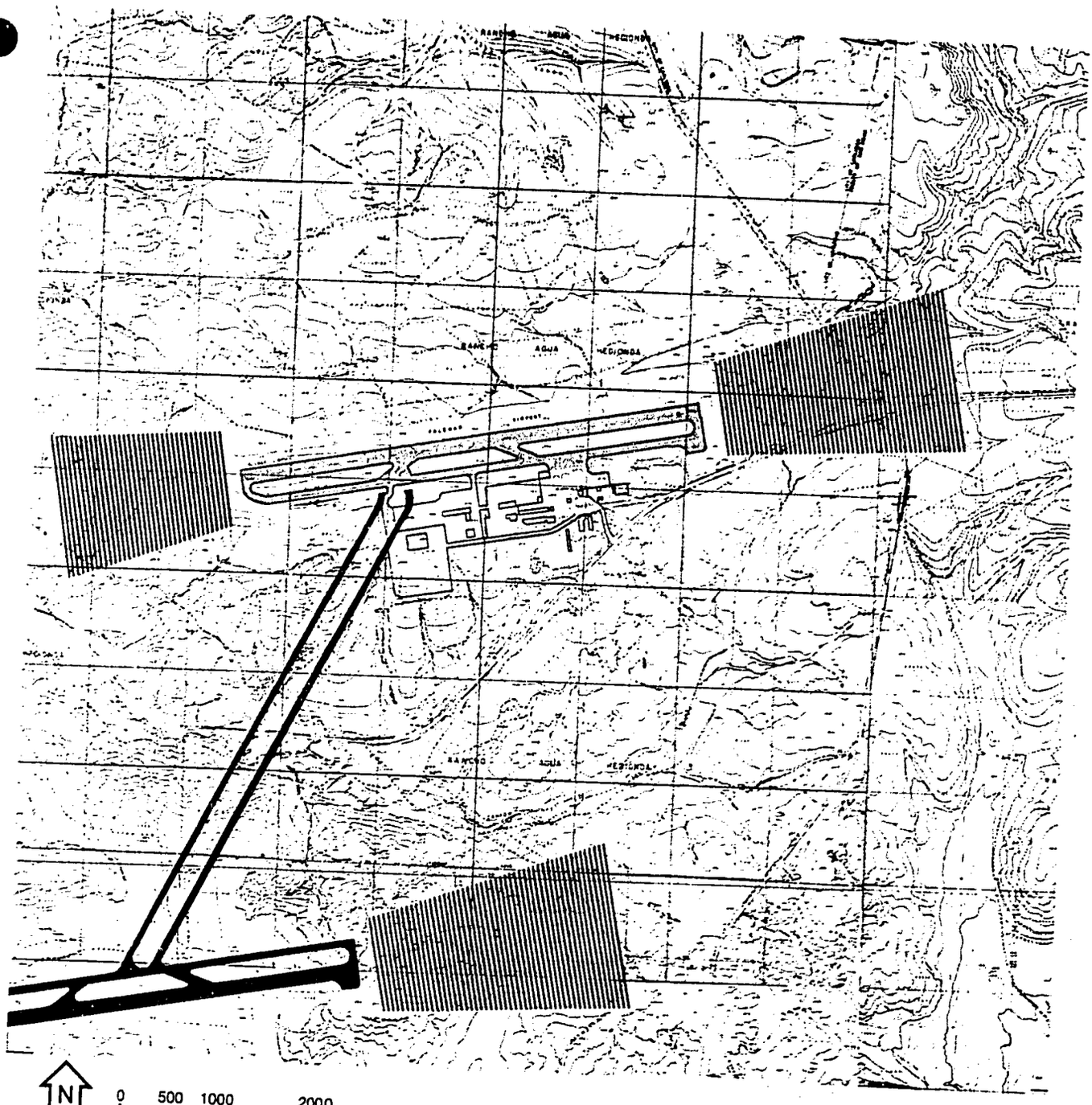
Terrain Analysis

SITE SELECTION (134)

Prior to any determination of a location for the second runway a schematic terrain analysis was conducted as shown in Figure III. 1. It is clear from this graphic depiction that the undulating terrain dictates surface locations, but recognizes that with fill any portion of the general area can be made to work.

Following this slope analysis, selection of a site for the second runway required consideration of the following factors:

1. Provision of the aeronautical facilities to meet FAA requirements, including the ILS system scheduled for installation on the existing runway and the spacing between runways currently required to be 700 feet minimum for simultaneous VFR operations.
2. Impact of the airport on the surrounding area.
3. Cost of construction, especially the grading costs associated with the hilly terrain around the airport.
4. Provision of adequate Fixed Base Operator area at the runway level.



Alternate — 1

Figure III.2

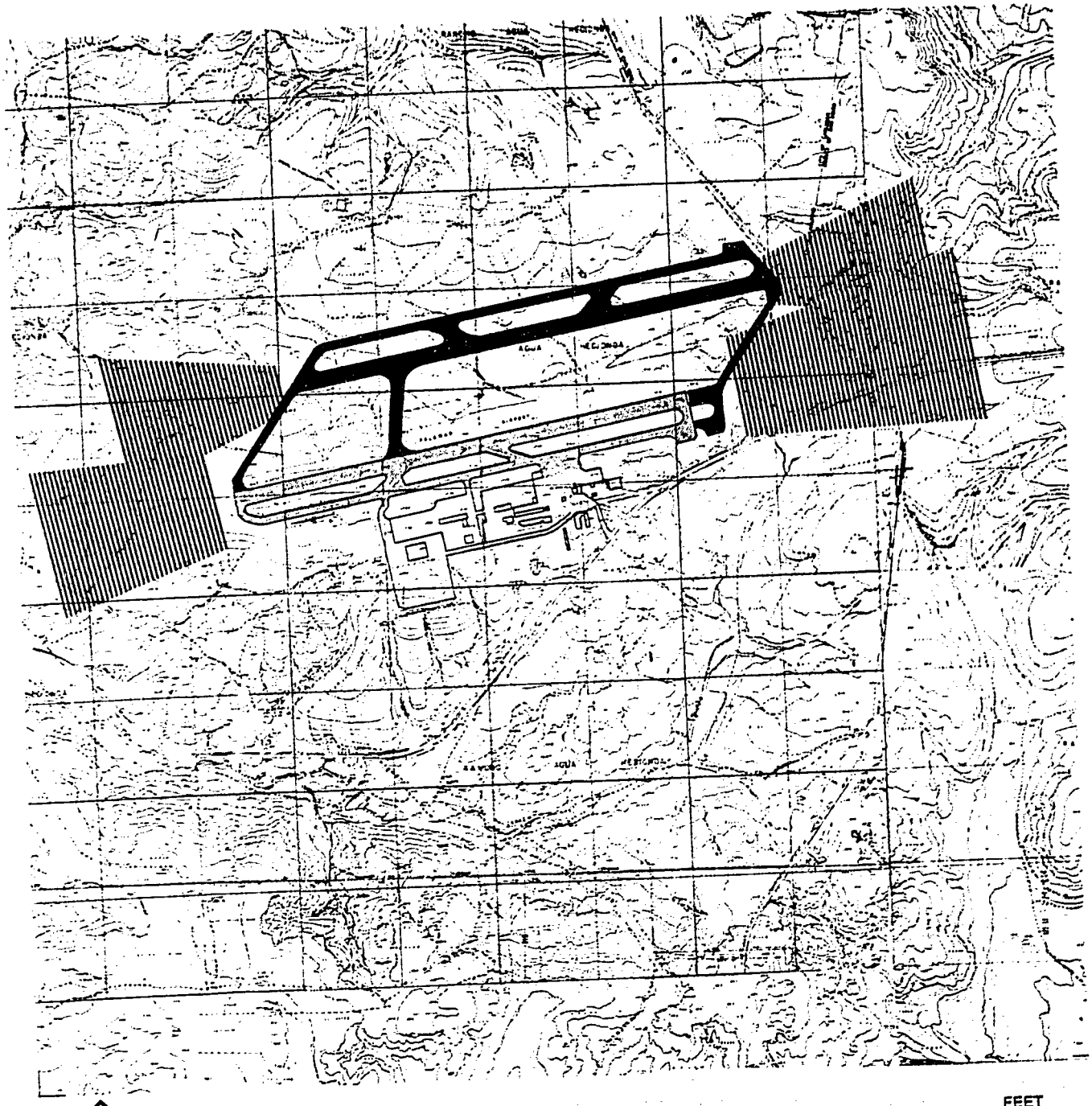
5. Operating efficiency of the total airport configuration with the added runway.

6. Provision of sufficient area to accommodate the airport's future activities.

7. Utilization of existing facilities to the maximum possible extent.

A number of second runway sites were investigated in all directions from the present airport. Location of the second runway at a great distance from the present runway would separate airport activities and require taxiway connections between the runways, and this alternative did not afford any advantage in construction cost and certainly would be detrimental to the efficient operation of the airport.

Such locations constituted, practically speaking, a new airport. Nevertheless, Alternate 1 shows a plan for such a location. This plan would broaden the impact in the surrounding area, present problems for airport operational efficiency, encounter obstructions, and would be costly. It is therefore not recommended.

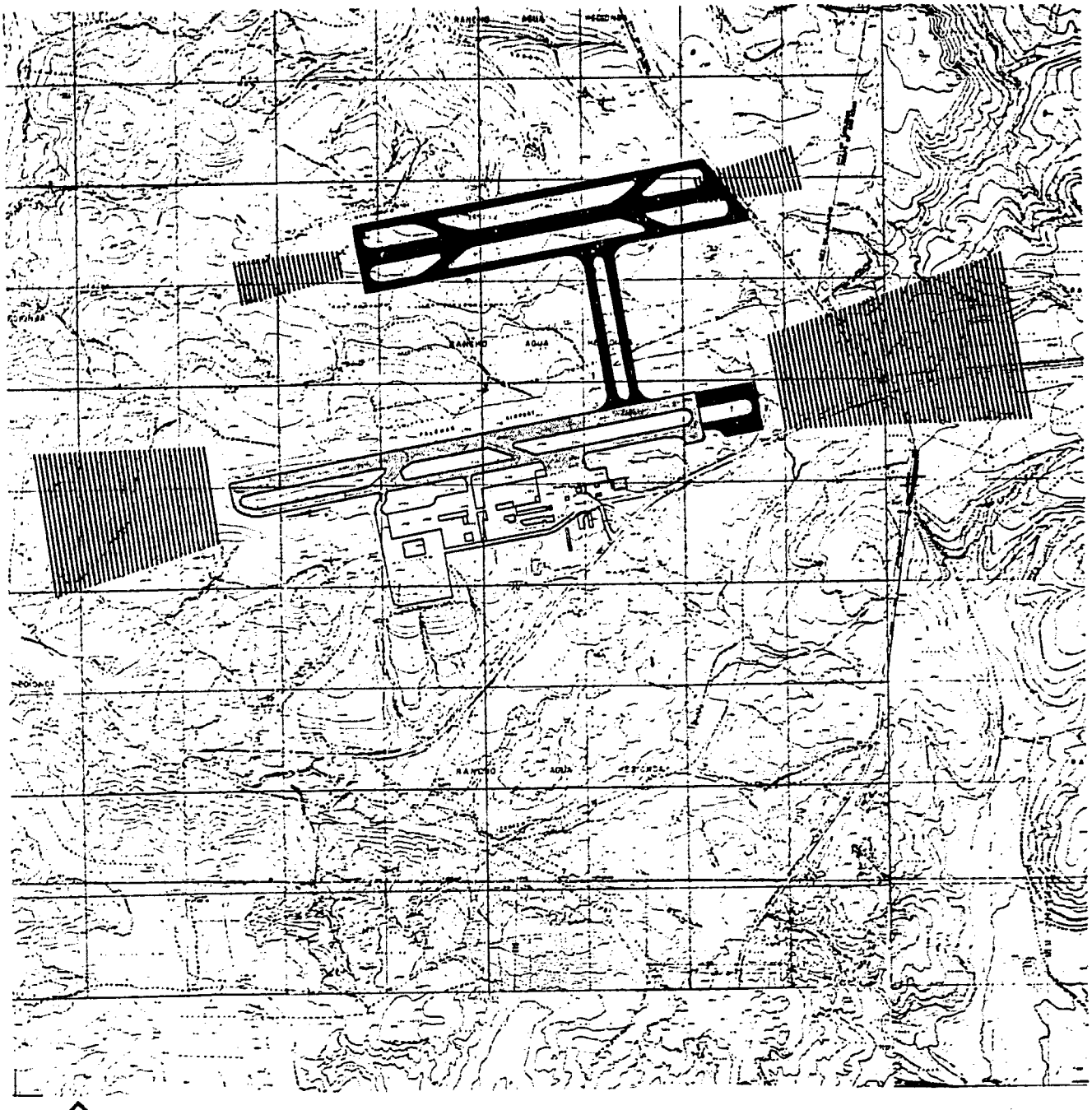


Alternate – 2

Figure III.3

Alternate 2 presents a plan for a close runway spacing. While present FAA requirements call for a minimum spacing of 700 feet between a precision runway and a VFR runway., the FAA plans to increase this requirement to 1,000 feet and it is considered advisable to use the 1,000 foot spacing. This alternate limits access to the runways to that available from only one side of each runway, it would not provide freedom to accommodate short-haul air service, and it places the runway over a canyon, thus requiring additional earthwork. The addition of short-haul air service would require location of the terminal area on the north side of the north runway or the moving of FBO areas from their present locations. If the northern location were chosen, the north runway would need the length to accommodate such service or the aircraft would have to cross both runways to reach the terminal. This alternate provides for the ILS on the existing runway.

A study of the terrain contours north of the existing runway revealed a reasonably flat broad ridge between 1,800 feet and 2,000 feet north of the present runway. This ridge has a slope downward to the west near one degree for a distance approaching 4,000 feet. This location provided the most desirable site for a new runway. Alternates 3 through 6 place the runway in this approximate location.



N

0 500 1000 2000 5000 FEET

SOURCE: WLPA

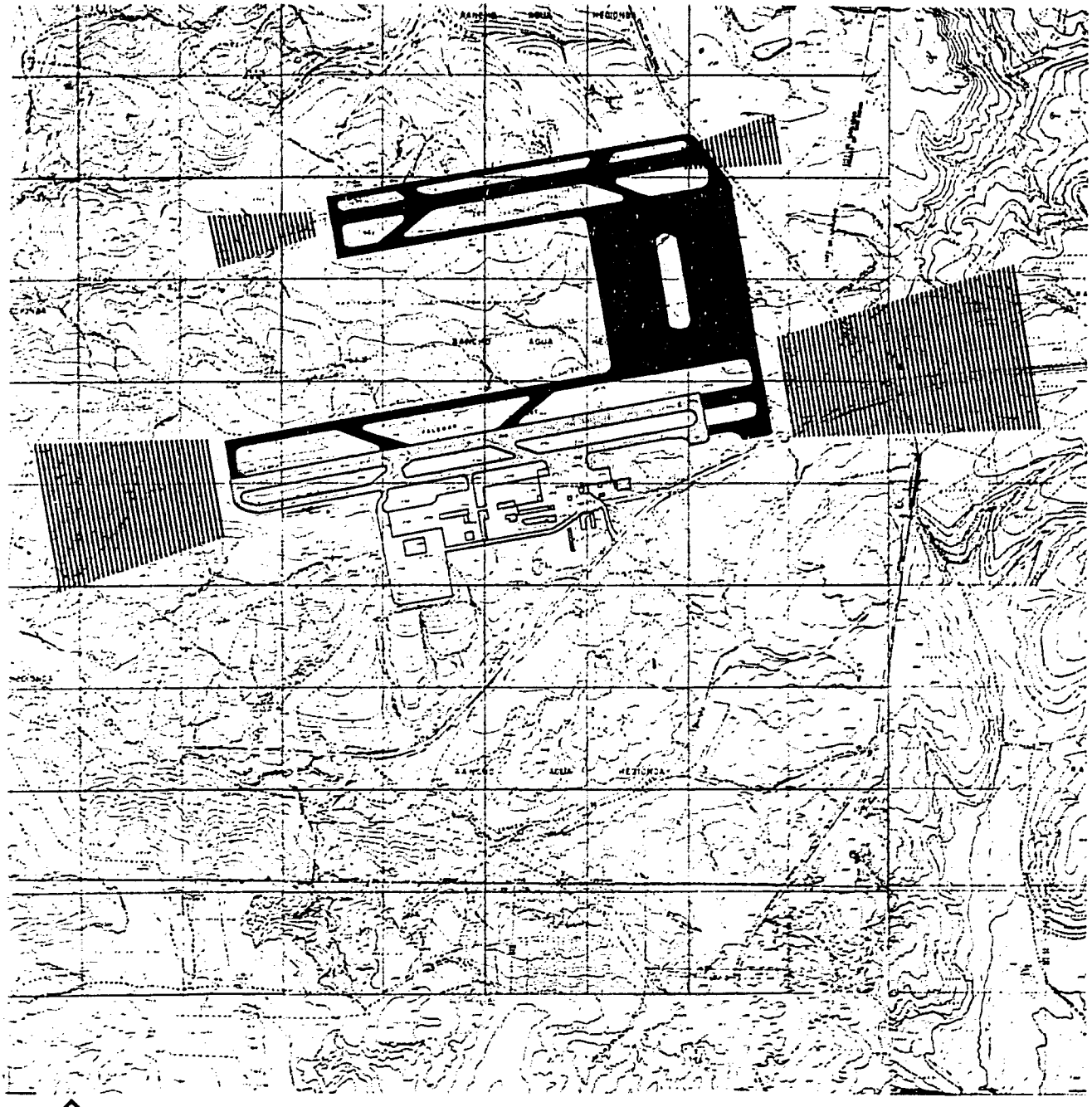
EXISTING RUNWAY/TAXIWAY SYSTEM

NEW RUNWAY/TAXIWAY SYSTEM

CLEAR ZONE

Alternate – 3

Figure III.4



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0 500 1000 2000 5000 FEET

SOURCE: WLPA

EXISTING RUNWAY/TAXIWAY SYSTEM

NEW RUNWAY/TAXIWAY SYSTEM

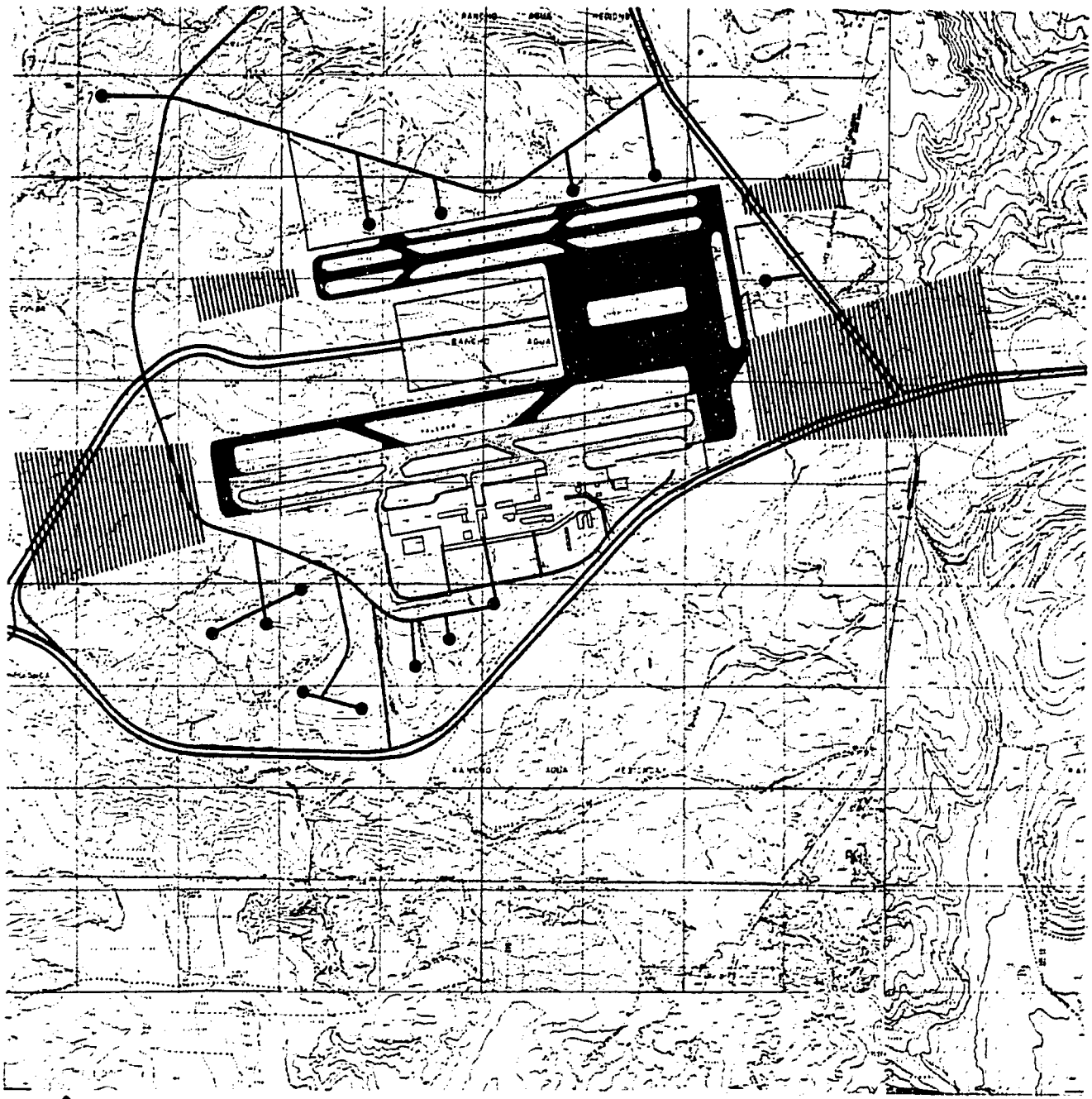
CLEAR ZONE

Alternate — 4

Figure III.5

Alternates 3 and 4 show a 3,500 foot long runway at 2,000 feet and 2,400 feet north of the existing runway, respectively. These alternates pushed the Fixed Base Operator area north of the present runway into low ground north of the second runway which resulted in an unworkable situation.

Alternate 5 shows a 4,000 foot runway 1,850 feet north of the existing runway. This alternate leaves the precision landing system on the existing runway and provides an area between the runways at the east end of the runways for FBO's and/or an air carrier terminal area. The approach area at the east end of the new runway is south of the industrial area located to the east of El Camino Real. This plan provides for all the factors listed as criteria for site selection. Since the new runway, under this configuration, would be shorter and therefore used by smaller aircraft, the noise impact would be minimized. The approach and clear zones would be those for a general utility runway, which are considerably less than for the precision landing runway. This alternate considers that a precision ILS landing system will be installed on the existing runway recognizing the variance from FAA standards for the building restriction line, and tie-down dimensions. This alternate best meets the composite of all factors to be considered in the light of costs and future requirements.



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0 500 1000 2000 5000 FEET

SOURCE: WLPA

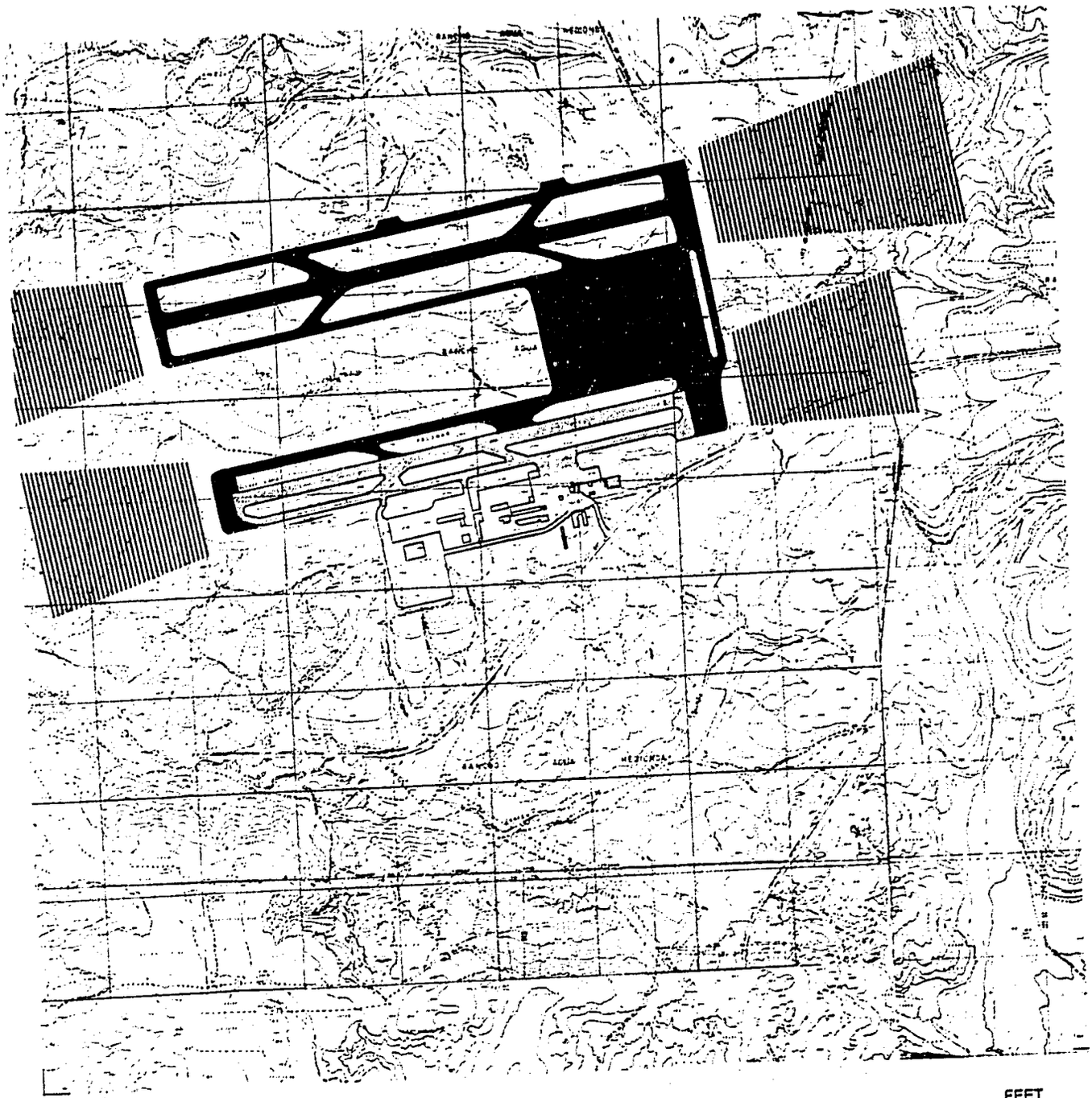
EXISTING RUNWAY/TAXIWAY SYSTEM

NEW RUNWAY/TAXIWAY SYSTEM

CLEAR ZONE

Alternate — 5

Figure III.6



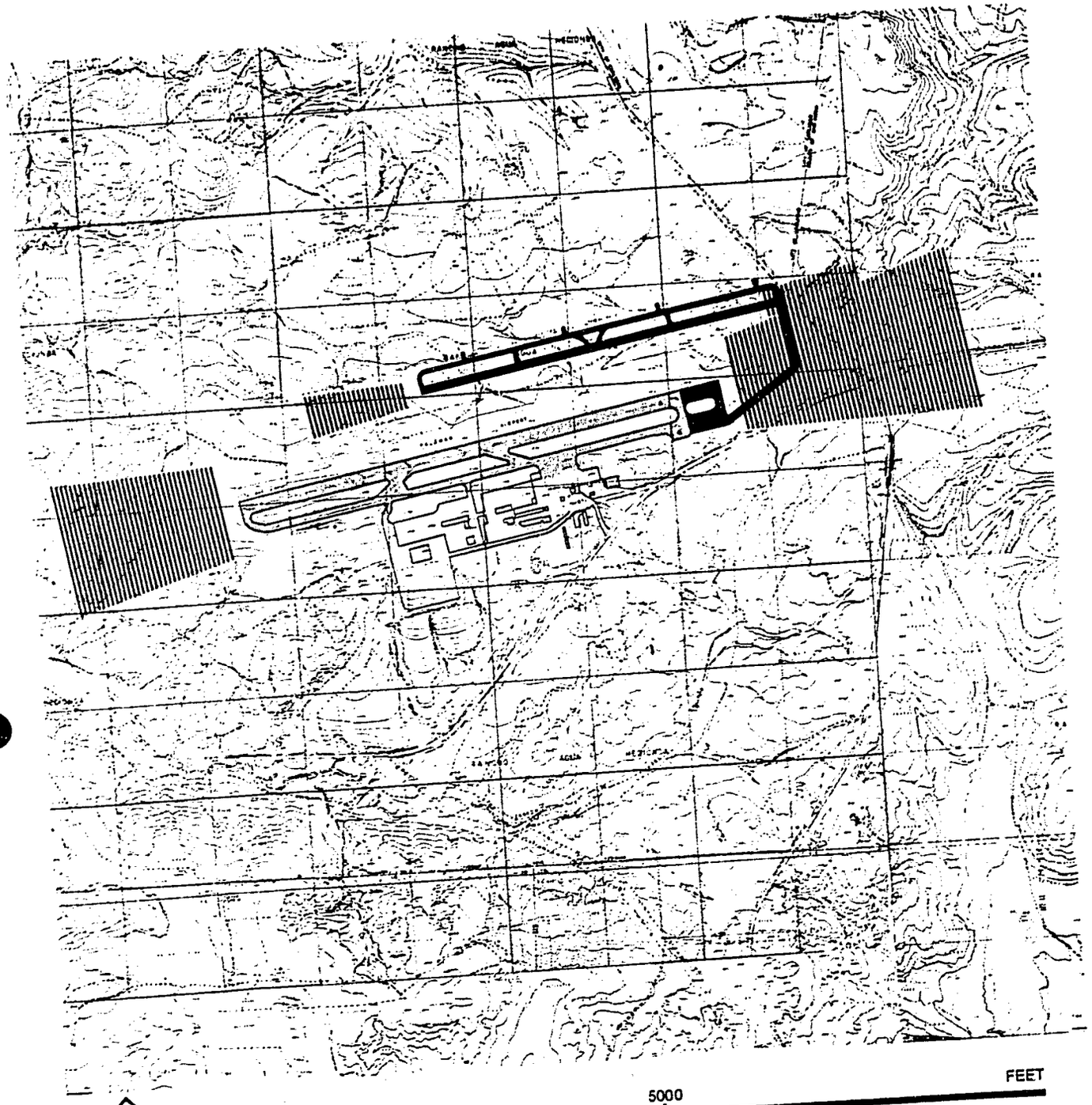
Alternate — 6

Figure III.7

Alternate 6 provides a new runway that would accommodate a precision landing system in accordance with FAA requirements. The new runway is shown at 5,500 feet to accommodate the larger general aviation aircraft and short-haul air carrier service. This alternate is "clean" insofar as it meets FAA requirements (with the exception of two hills 7 miles or more from the runway), but its impact on the surrounding area would be greater than that of Alternate 5 because of the larger approach and clear zone area. The costs are considerably more. This alternate is therefore not recommended.

The progress of this study to October 1973 resulted in selection of Alternate 5. At that time the County stopped the planning process due to a conflict in the land ownership and use which was necessary to implement the design. In August of 1974, the County directed the planners to locate the runway as shown in Alternate 7. This location represents a compromise solution which does not fully answer the areas' future needs. However, it does supply additional capacity to the existing facility which is of some help to the future requirements.

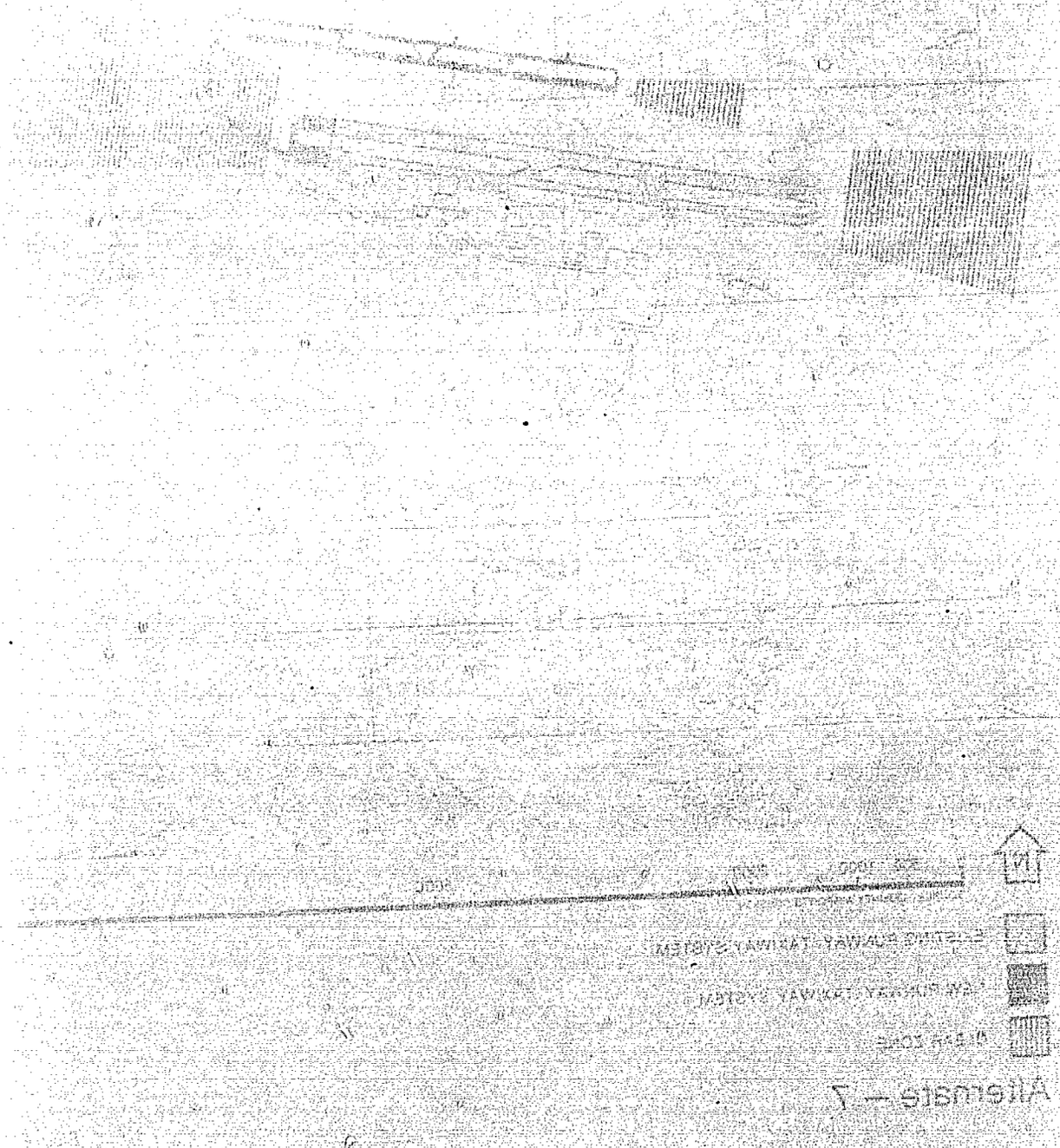
Alternate 7 provides the minimum separation to meet simultaneous VFR operational criteria and also allows for necessary FBO space to the north.

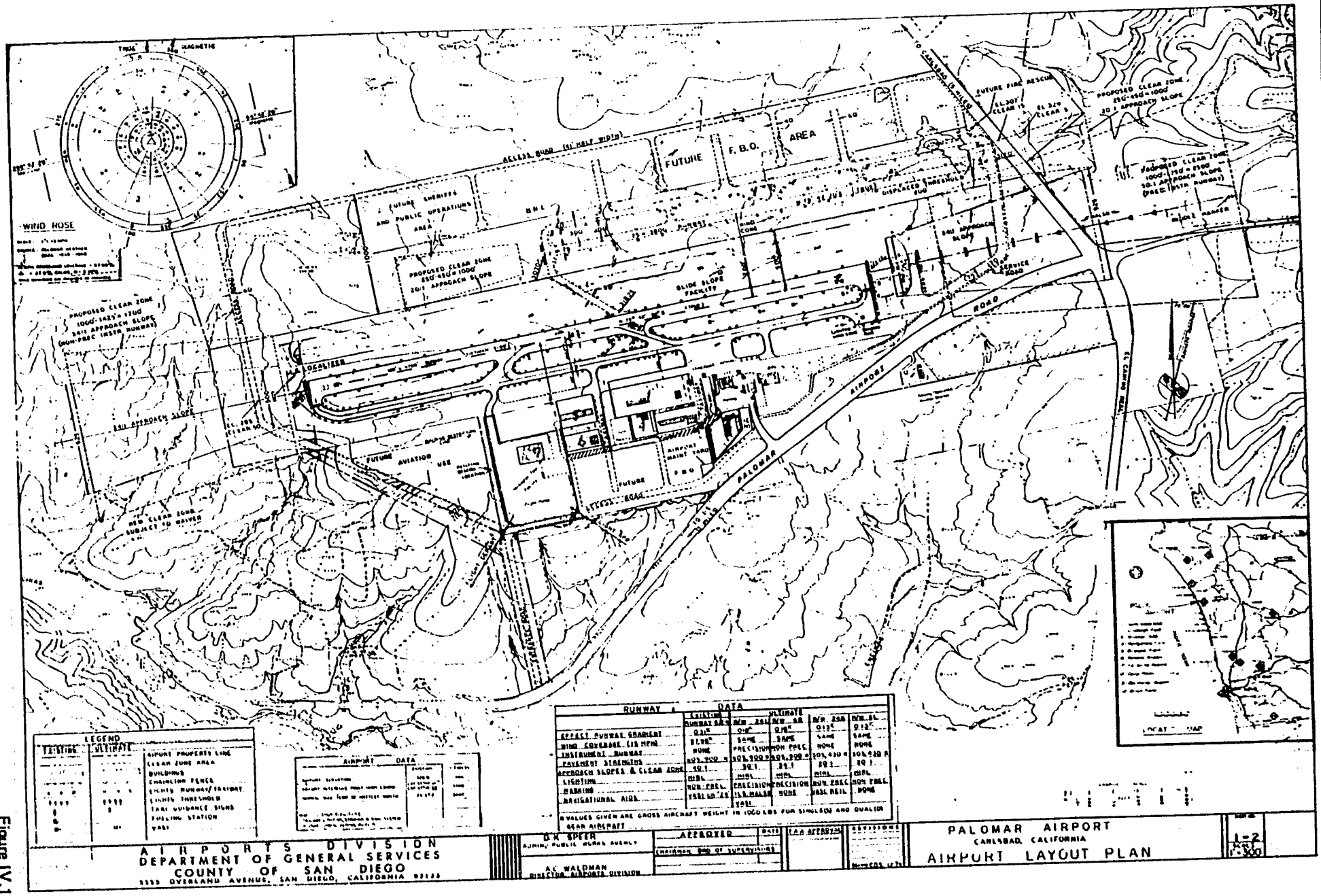


Alternate — 7

Figure III.8

in view of the constraints imposed by this configuration, air carrier facilities may not be located in a convenient place and further study of that particular problem will be necessary when the need becomes more clearly established.





AIRPORTS DIVISION
DEPARTMENT OF GENERAL SERVICES
COUNTY OF SAN DIEGO
5555 OVERLAND AVENUE, SAN DIEGO, CALIFORNIA 92123

D.K. SPEER
ADMIN. PUBLIC WORKS AGENCY

A.C. WALDMAN
DIRECTOR, AIRPORTS DIVISION

APPROVED | DATE
CHAIRMAN, BOD OF SUPERVISORS

FAA APPROVAL

REVISIONS

PALOMAR AIRPORT
CARLSBAD, CALIFORNIA
AIRPORT LAYOUT PLAN

1" = 200'

Figure IV.1

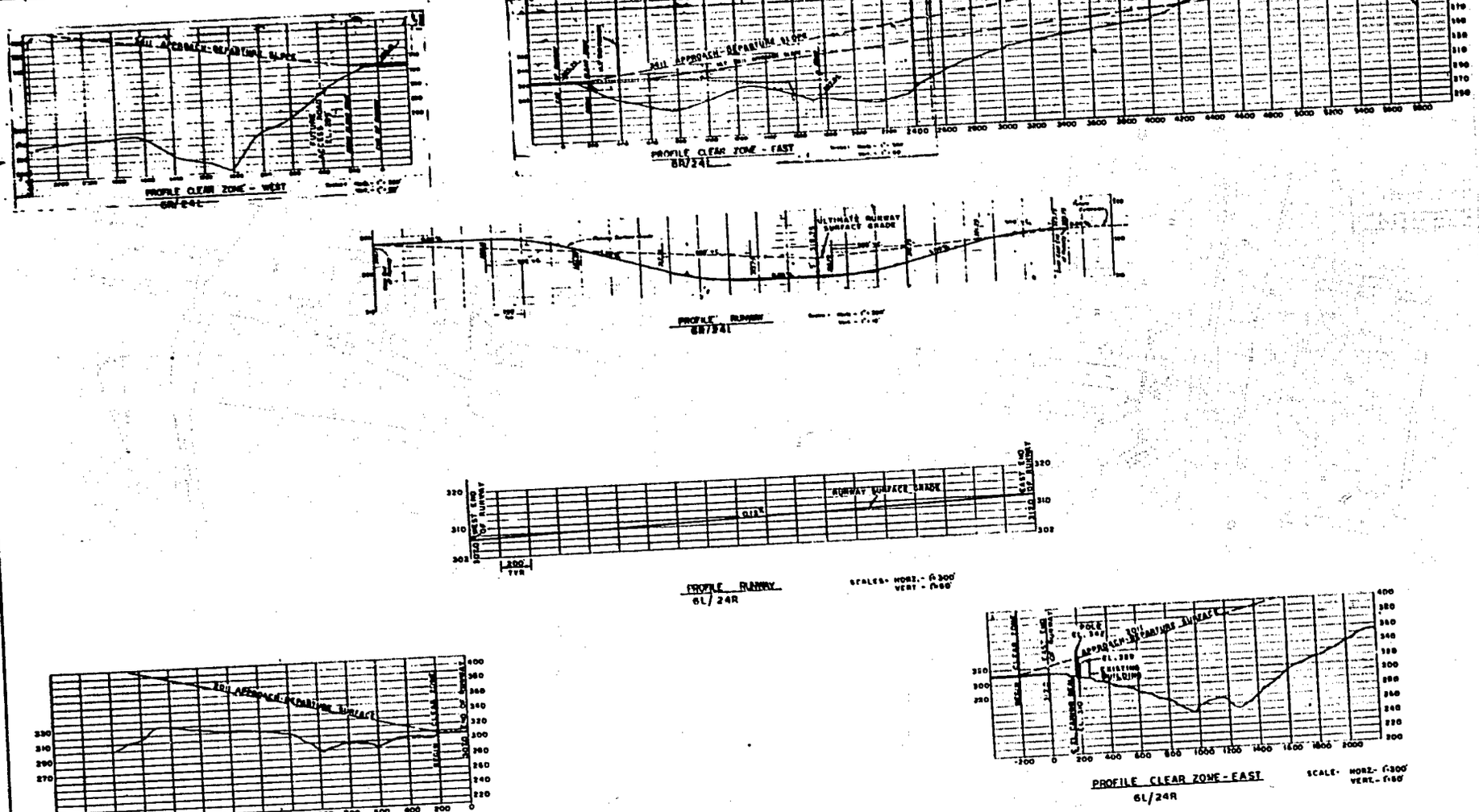


Figure IV.1

105

AIRPORTS DIVISION
DEPARTMENT OF GENERAL SERVICES
COUNTY OF SAN DIEGO
5555 OVERLAND AVENUE, SAN DIEGO, CALIFORNIA 92123

D.R. SAFER
ADMIN.- PUBLIC WORKS AGENCY

A.C. WALDMAN
DIRECTOR, AIRPORTS DIVISION

APPROVED
(CHAIRMAN, BRD OF SUPERVISORS)
DATE

FAA APPROVAL

REVISIONS

PALOMAR AIRPORT
CARLSBAD, CALIFORNIA
AIRPORT LAYOUT PLAN

2-2

AIRPORT LAYOUT PLAN (135)

The airport layout plan shown in Figure IV.1 is based on a second runway located 700' C/L to C/L north of the present runway.

Runways

The existing runway is shown extended 400 feet on its east end, thus increasing its length from 4,700 feet to a length of 5,100 feet. This extension meets the required length to accommodate 100% of the fleet at 60% load as indicated in Chapter II., Facility Requirements. This extension should be reasonable in cost, although it should be pointed out that it lies over an area of sanitary land fill (currently being filled to the runway level) and the extension would require a detailed engineering design approach to meet the wheel loading requirements.

The profile of the existing runway has a decided dip at the center that has been the cause of pilot complaint. The profile meets requirements as to line of sight, grade, and vertical curves for basic transport and general utility runways; however, it does not meet the requirements for vertical curve length (1,000 feet for each 1% grade change) for certified air carrier airports as specified in Advisory Circular AC 150/5325-2B. The plan shows

the profile corrected to meet this requirement involving cutting the grades in half by filling in the center portion of the runway and effectively raising the low point on the runway by 5 feet. The effective runway gradient then becomes 0.186%. With this gradient, a runway length of 5,100 feet would accommodate 100% of the fleet at 60% load.

The second runway is located 700 feet north of the existing runway and is 3,600 feet long. Runway width is 75 feet and runway strength is designed for 12,500 pound gross weight aircraft.

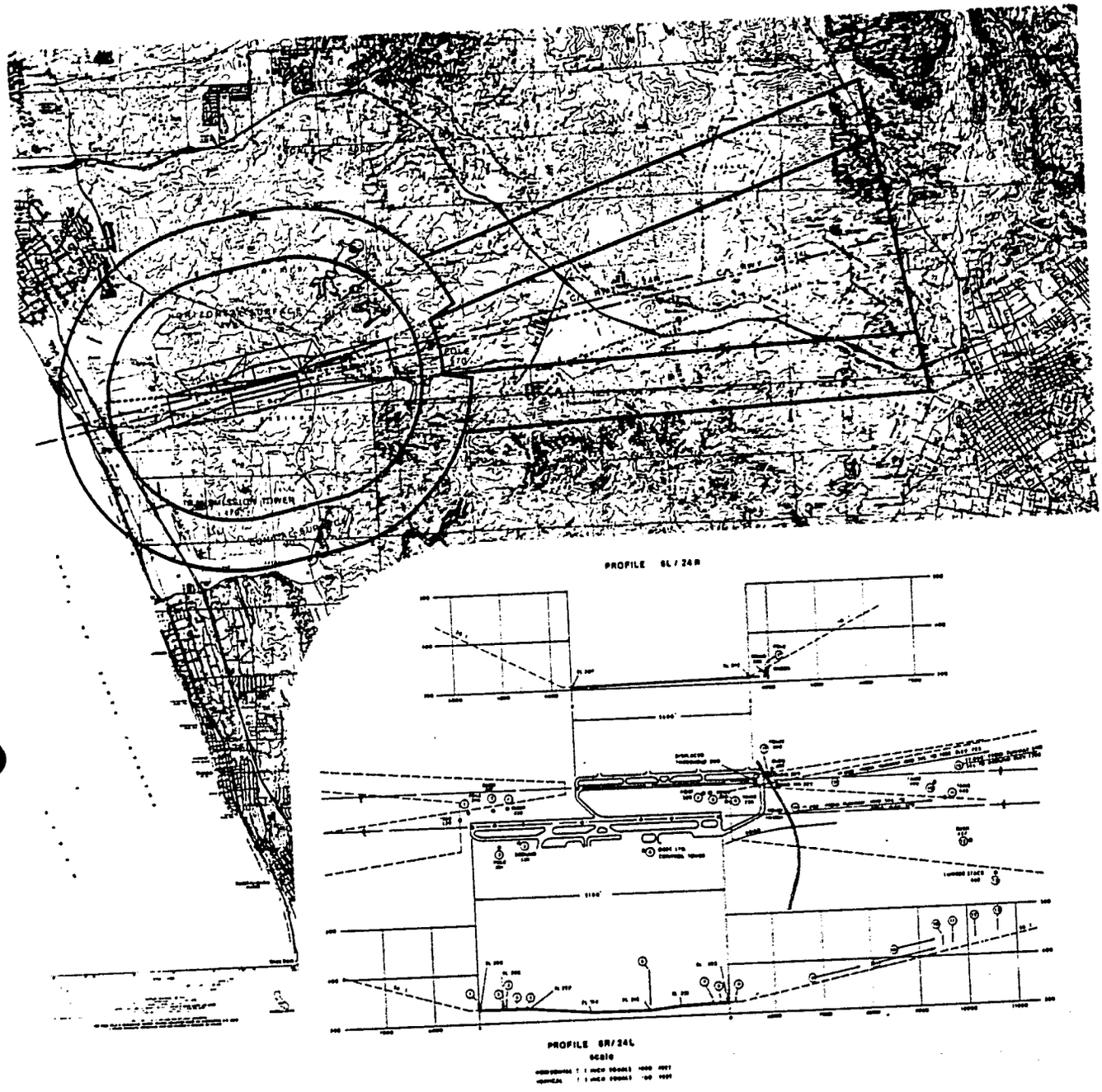
Taxiways

A taxiway is provided to connect the new runway with the existing runway. This taxiway is planned as a two-way 75 foot wide (non-standard) connector.

A parallel taxiway with high speed turnoffs in symmetrical locations is planned on the north side of the new runway. This taxiway will be 40 feet wide and its centerline will be 200 feet north of the new runway.

Approach Surfaces and Clear Zones

Approach surfaces are shown in Figure IV.2. The 50:1/40:1 approach for precision landing is penetrated by a hill approximately one mile east of the runway. This hill appears to be just



N

SOURCE: WLPA RESEARCH

INDICATES TERRAIN PENETRATION OF IMAGINARY SURFACES

Obstruction Diagram and Profiles

Figure IV.2

below the present 40:1 approach slope. To remove the hill would require moving nearly 900,000 yards of earth. It is understood, however, that the FAA plans to install a Category I (200' - $\frac{1}{2}$ mile) ILS with a 3 degree glide slope needing only a 34:1 approach slope for the first 10,000 feet and a 29:1 slope for the next 40,000 feet. The hill would not project into the 34:1 slope. However, an avigation easement should be acquired for approach protection. The approach surfaces shown on the drawing, however, reflect the 50:1 basic slope requirement for the first 10,000 feet and 40:1 for the remaining 40,000 feet. All other dimensions are as prescribed in FAR, Part 77.

Building Restriction Lines and Obstruction Lines

FAA requirements for a precision instrument runway, call for a distance between runway center line and taxiway center line of 400 feet and a distance from runway center line to building restriction line of 750 feet. For Palomar these distances are 267.5 feet and 625.5 feet respectively. To meet these requirements, two alternatives are possible:

1. The runway could be relocated 132.5 feet further north, or
2. The taxiway could be moved 132.5 feet south, and six structures including the tower relocated.

Either of these alternatives would be costly - a new runway would exceed $1,000,000 and a new taxiway would exceed $500,000. The intent of the requirements is to provide for larger aircraft and a proper environment for the functioning of the ILS system, and since larger aircraft will constitute a small percentage of activity at Palomar and since ILS systems can be designed within limited site restrictions, the plan recommends that the existing taxiway and building restriction line locations be maintained and that recognition be given to the variance.

Paving

Since the existing (runway) pavements at Palomar Airport have single wheel loads of 60,000 pounds and dual wheel loads of 90,000 pounds, it is anticipated that the load bearing capabilities will not be increased until such time as short-haul operations become a reality which require the use of aircraft exceeding maximum gross weights of 60,000 pounds.

With respect to design specifications, it is anticipated to use flexible pavements consisting of standard surface, base and sub-base courses.

Lighting

The existing medium intensity lighting system (MIRL) appears to be sufficient to meet proposed aircraft demands. Based on an examination of projected aircraft types, a high intensity system is not required for future use on either the existing Runway 6R-24L or the proposed Runway 6L-24R.

The existing taxiway edge lighting system expanded to cover the proposed new taxiways requires no significant modifications since the ultimate taxiway network will not be one of complex alignments Centerline runway lighting is recommended for Runway 6R/24L when that runway is reconstructed.

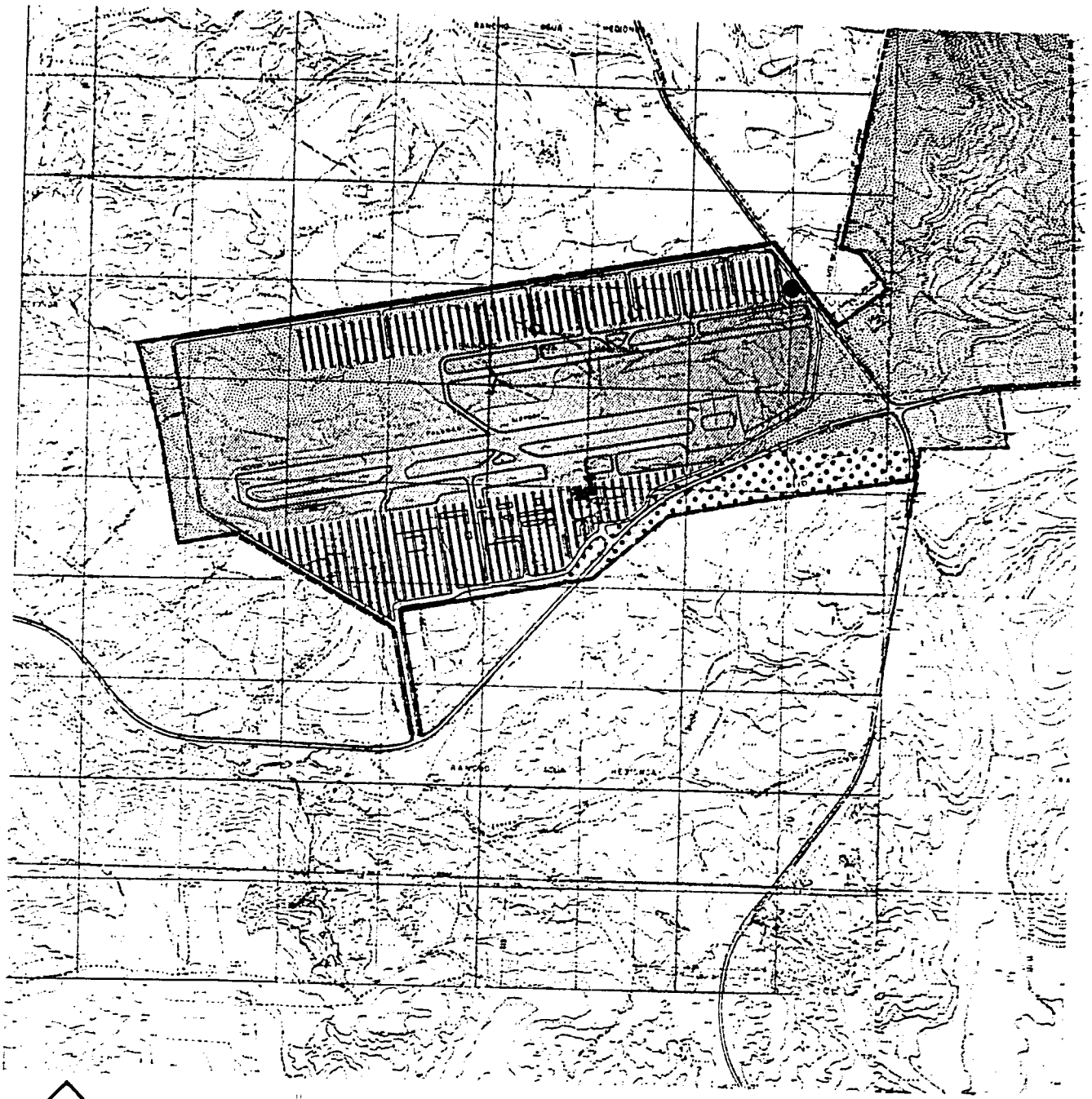
Approach Aids

The selection of the MALSR system as Palomar's approach lighting system is based on established FAA criteria in FAR Part 97 with respect to definite aircraft approach categories relating to certain aircraft characteristics and performance and the approach lighting systems selection criteria in Advisory Circular 150/5300-2B.

This (MALSR) system will of necessity be relocated when the east end of Runway 24L is extended.

It is suggested that a Visual Approach Slope Indicator (VASI) be installed on Runway 24R.

It would be well to consider Runway End Identifier Lights (REIL) on Runway 24R for use both during periods of minimum visibility and at night.



N

0 500 1000 2000 5000 FEET

SOURCE: WLPA

RUNWAY, TAXIWAY SYSTEM

AVIATION ORIENTED

INDUSTRIAL / COMMERCIAL

RECREATION / BUFFER

ADMINISTRATION BUILDING

FIRE/RESCUE STATION

CONTROL TOWER

Ultimate Land Use Plan

Figure IV.3

LAND USE PLAN (136)

The basic concept behind the plan is one which will allow expansion of the airport incrementally, as required, attempting to keep to a minimum the amount of improvements necessary at any stage in the development. As a general diagram it is proposed that the airport should develop in an east to west direction, utilizing the existing highway to the east and road to the south, as the starting point or base-lines of development. The overall master plan for the airport consists of:

1. The addition of a new utility runway to the north of the existing runway, and parallel to it.
2. Development of FBO's, and access roads to the FBO's to the south of the existing runway, and to the north of the new runway.
3. Development of two Commercial/ Industrial sites adjacent to the present entrance road, since these sites are not accessible to the runways due to grade differences.

This plan envisions that development which will support the projected general aviation demand only.

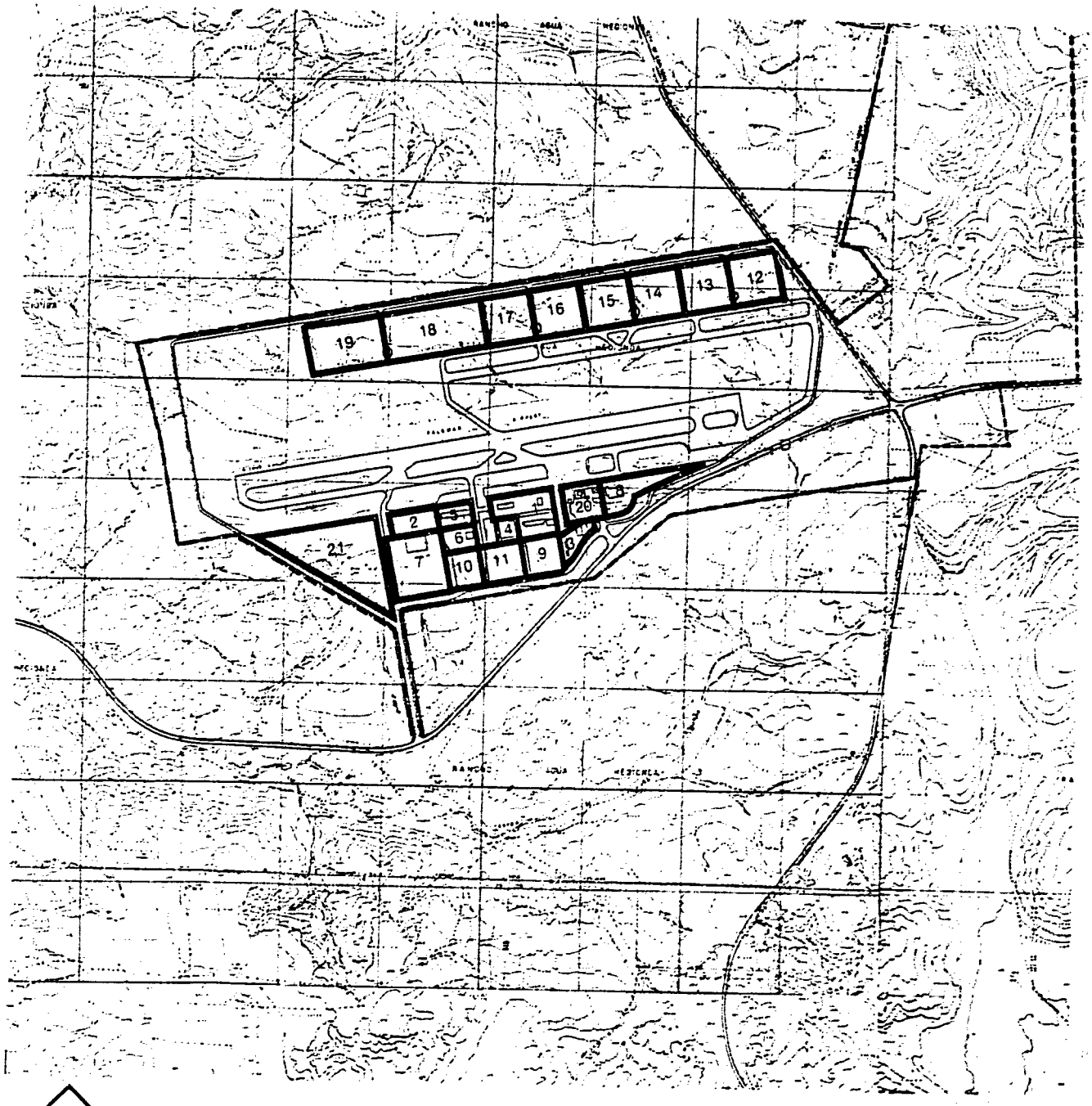
Phasing

The general plan for implementation is as follows:

1. The FBO area to the south of the existing runway, utilizing the existing entry to the airport, requires new access to prevent the present conflict of taxiways crossing roads. A relocated road is shown to provide access to the administration area, Hughes operations, and new FBO locations;

2. The second runway, its parallel taxiway and the easterly connecting taxiway should be constructed as soon as possible;

3. The access road and intersection at the El Camino to the north of the new runway is next;



N

0 500 1000 2000 5000 FEET

1. FBO (EXIST) — 3.5 AC.
2. FBO (FUT.) — 2.2 AC.
3. FBO (EXIST) — 2.0 AC.
4. FBO (EXIST) — 0.9 AC.
5. FBO (EXIST) — 1.7 AC.
6. FBO (EXIST) — 1.2 AC.
7. FBO/INDUST. — 9.6 AC.
8. FBO (EXIST) — 6.0 AC.
9. FBO (FUT.) — 3.0 AC.
10. FBO (FUT.) — 2.5 AC.
11. TIE DOWN — 5.0 AC.
12. FBO (FUT.) — 4.8 AC.
13. FBO (FUT.) — 5.0 AC.
14. FBO (FUT.) — 5.0 AC.
15. FBO (FUT.) — 5.0 AC.
16. FBO (FUT.) — 5.0 AC.
17. FBO (FUT.) — 5.0 AC.
18. HANGARS (FUT.) — 10.0 AC.
19. HELICOPTER (FUT.) — 8.0 AC.
20. ADMINISTRATION (EXIST) — 3.7 AC.
21. FUTURE AVIATION RESERVED SPACE — 28.0 AC.

Aviation Oriented Use — 117 Acres

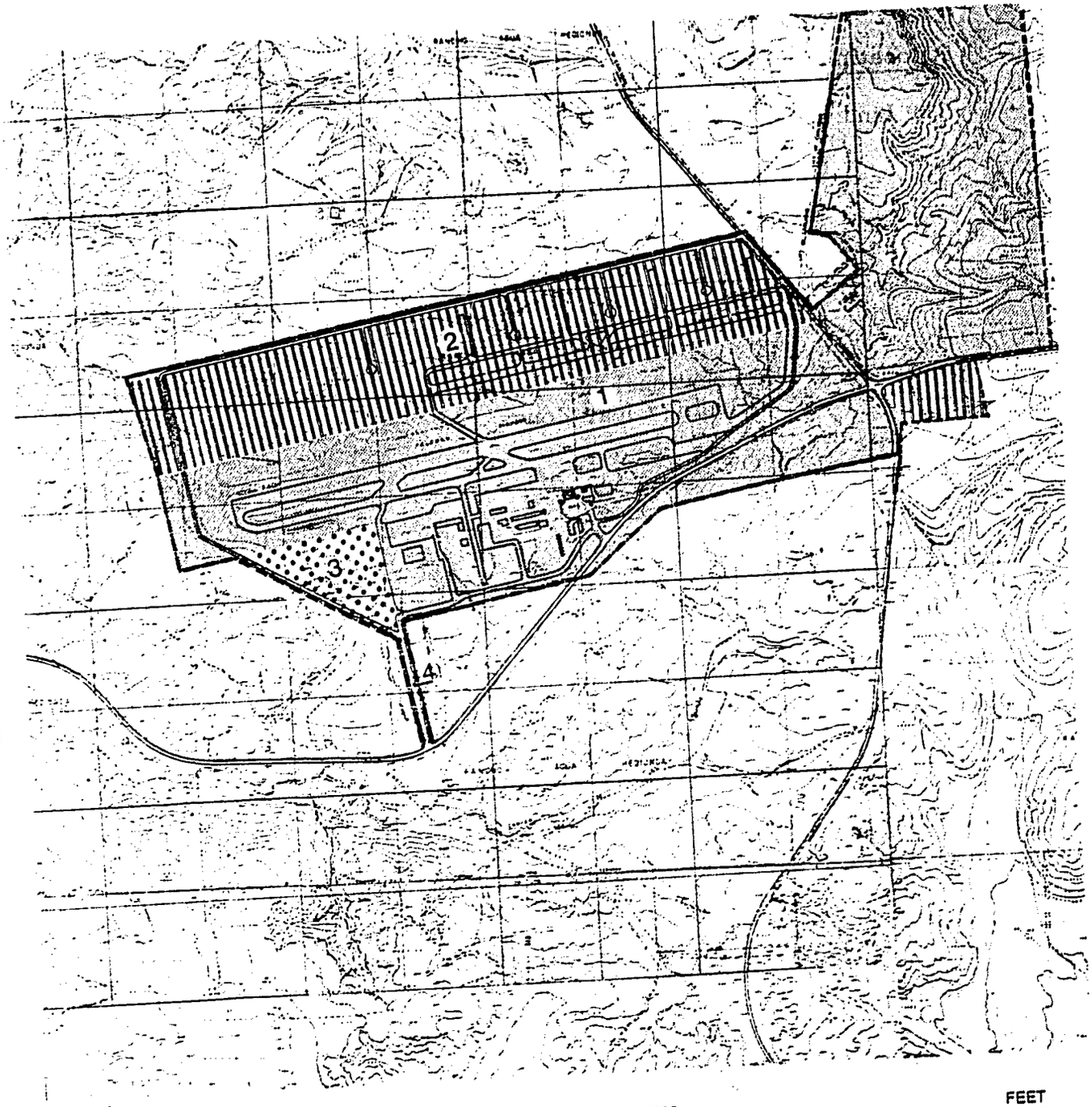
Figure IV.4

4. FBO site development along this new northerly access road, commencing at the east and moving west as demand requires, with the access road being built in sections concurrent with demand for FBO space;

5. The industrial/commercial sector would be developed to generate revenue from the airport tenants as well as from the surrounding community. The industrial area would be primarily aviation oriented firms not requiring direct airfield access. The commercial area would include small shops, a restaurant facility, a bank/savings & loan, etc..

Parceling

The Aviation Oriented Use is shown in parcels approximately 5 acres in size. (Figure IV.4)



N

0 500 1000 2000 5000 FEET

PARCEL NO.	STATUS	AREA (ACRES)
1	AIRPORT PROPERTY	486
2	AIRFIELD, FBO EXPANSION AND CLEAR ZONES	152
3	AVIATION FUTURE EXPANSION	28
4	ENTRANCE ROAD RIGHT-OF-WAY	1
	TOTAL	667

Figure IV.5

Land Classification

Allocation (Figure IV. 5)

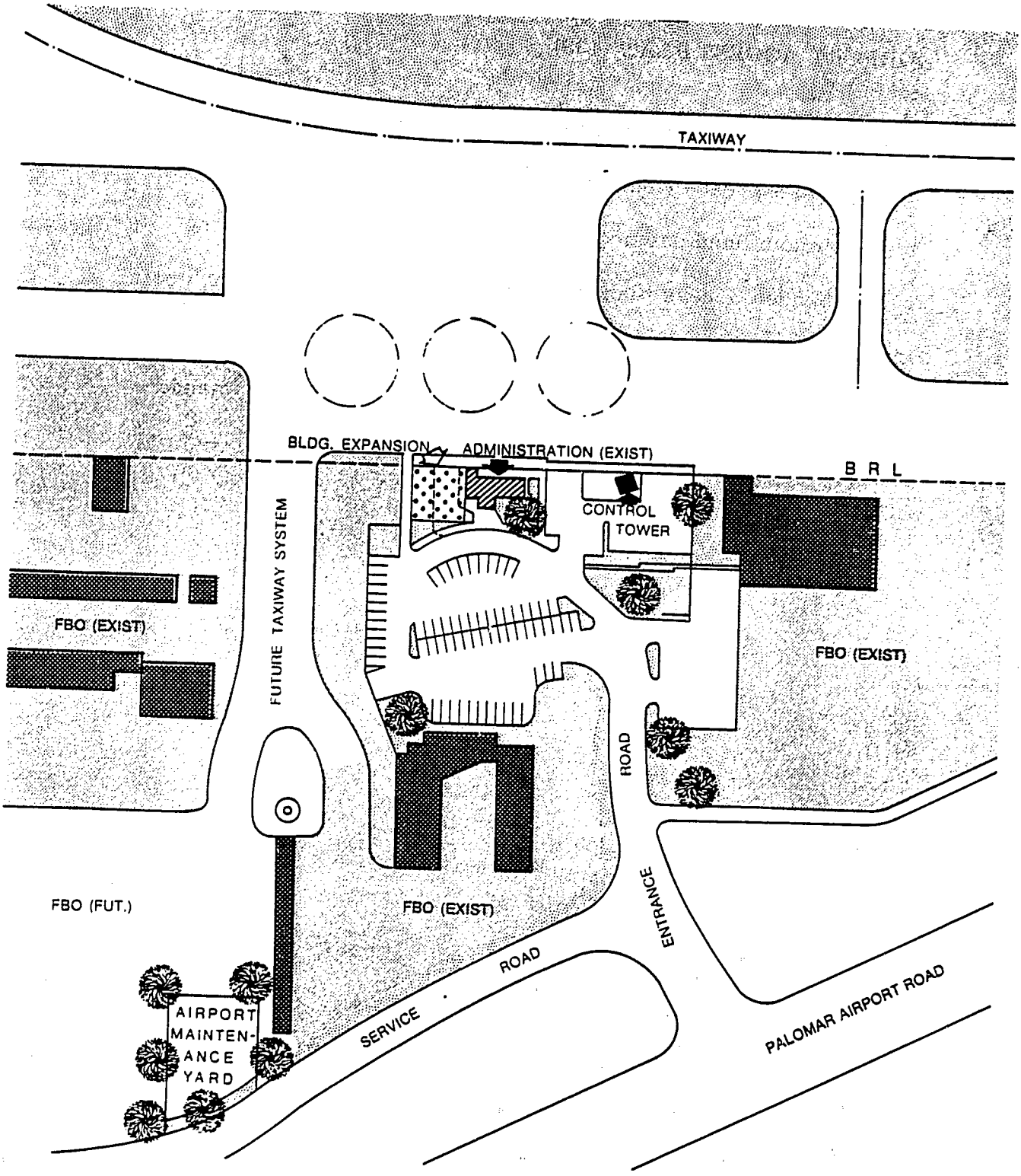
The land use plan consists of the following classifications of land:

1.	FBO's - total, including existing and projected areas and future reserve.	117.1 acres
2.	Airfield System	184.9 acres
3.	Industrial/Commercial	26.8 acres
4.	Recreational and Buffer Areas including Clear Zones	338.1 acres
	TOTAL	666.9 acres

TERMINAL AREA PLAN (137)

The space surrounding the present administration building has been shown to accommodate commuter airline needs up to three gates. This gate count would of course require expansion of the present building (as shown in Figure IV. 6).

In the event the community indicates a desire for air carrier service in the future, another location on the airport would be necessary for terminal development. To avoid the conflict of mixing general aviation airplanes and air carriers the site should necessarily be removed from its present location in the center of general aviation activity.

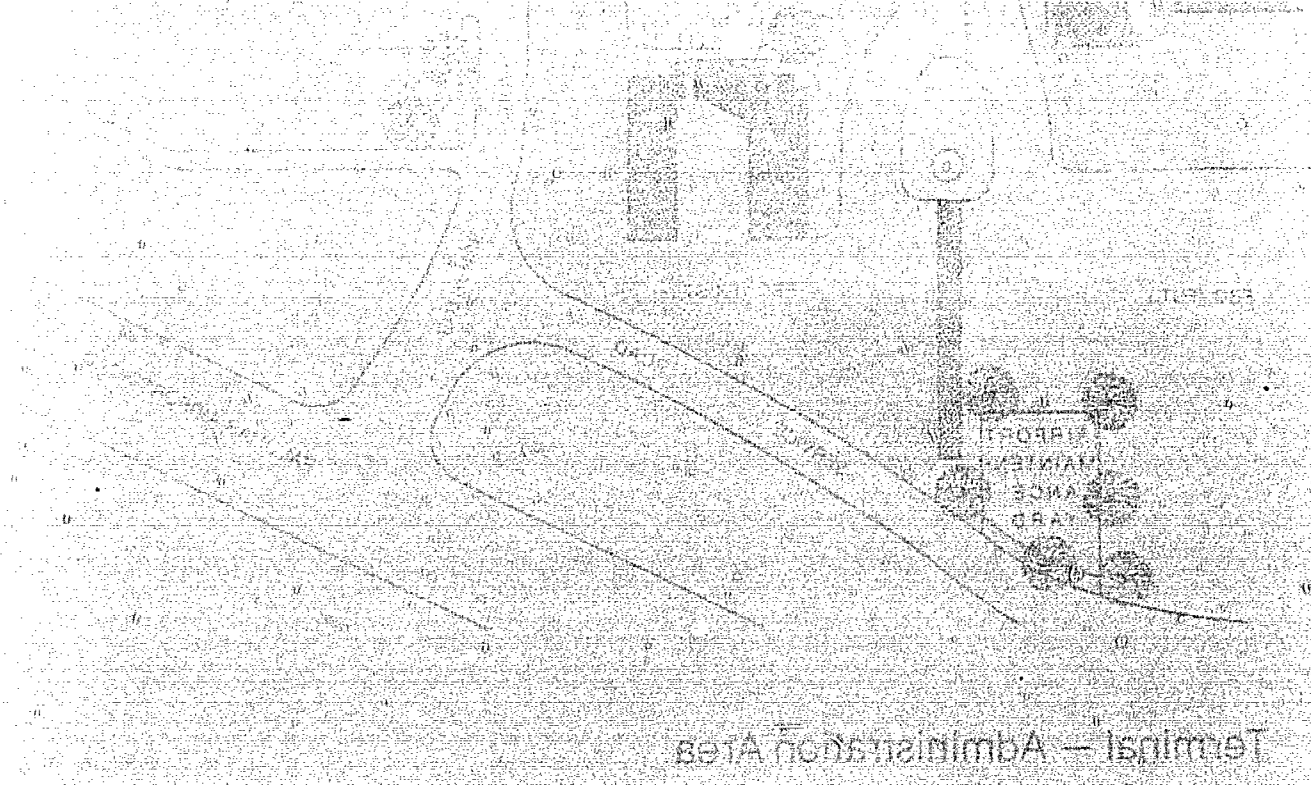


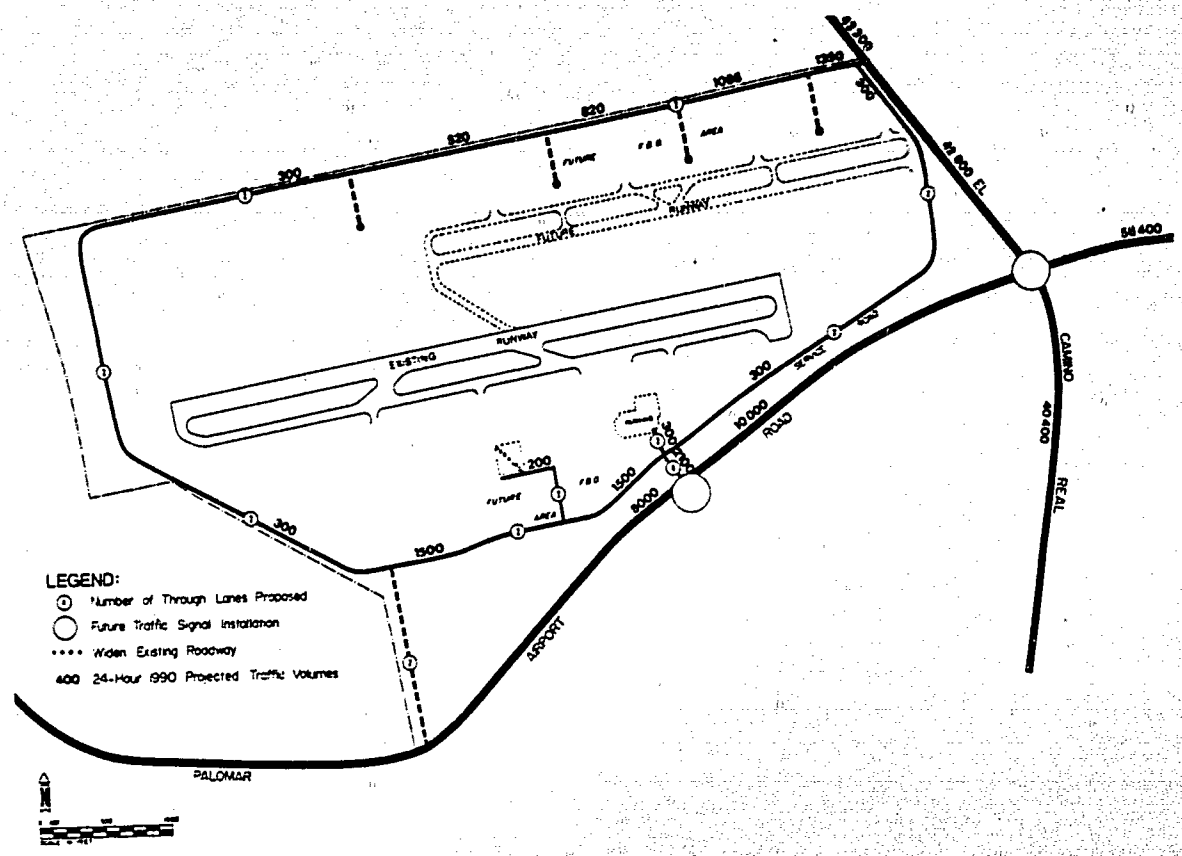
Terminal — Administration Area

Figure IV.6

AIRPORT ACCESS PLAN (138)

The successful implementation of the proposed Master Plan depends to a great extent on the development of adequate access to the various land use sectors. Figure IV. 7 illustrates the recommended access plan which would accommodate the projected traffic volume anticipated during the study period. (Chapter VI, Appendix A contains the details of the system and recommendations for its implementation.)





Recommended Access Plan

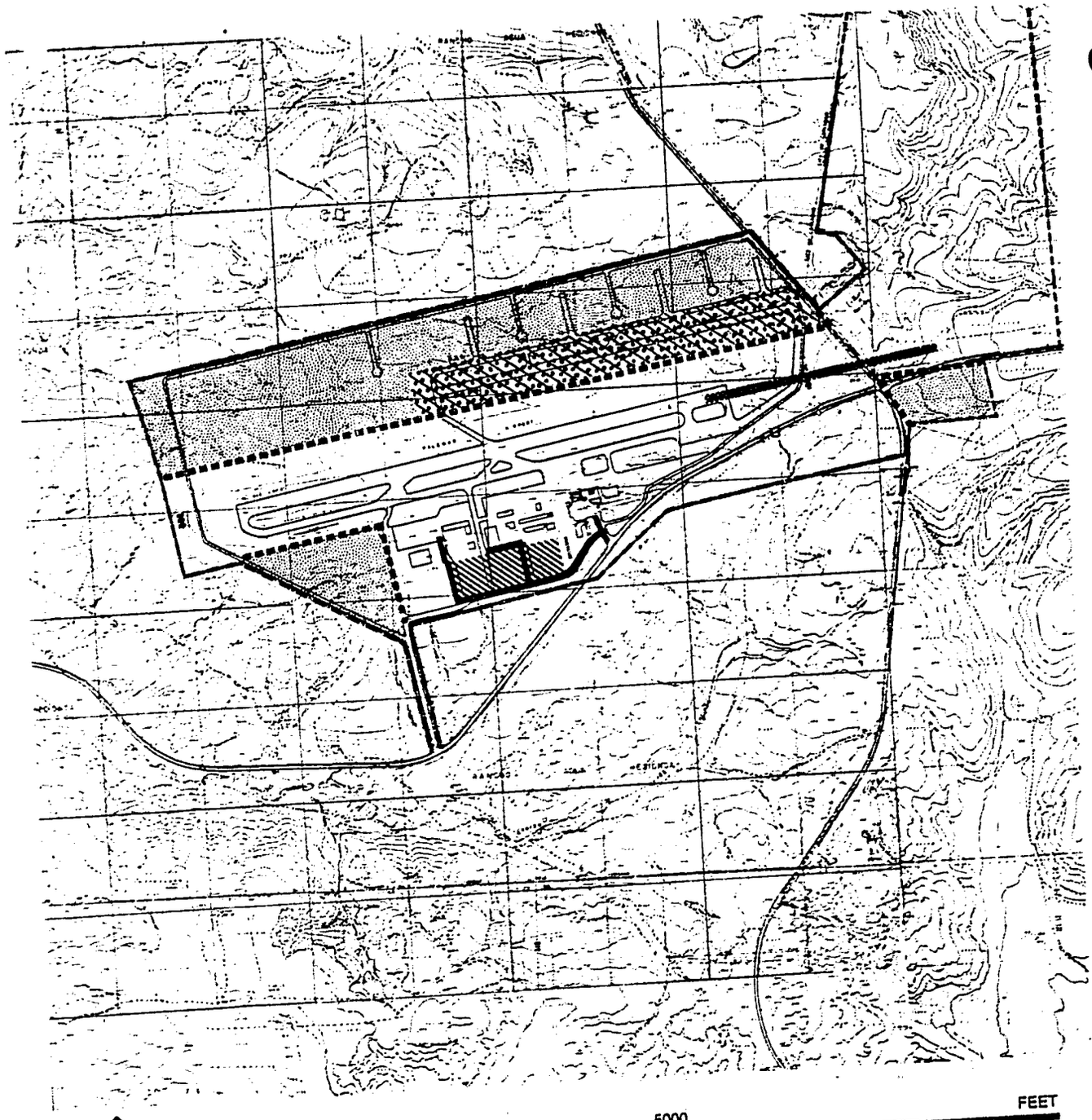
Figure IV.7

DEVELOPMENT SCHEDULE (139)

The development of Palomar Airport is primarily aimed at improving existing aeronautical facilities with the addition of a runway and expanded aviation oriented land. New runway and taxiway construction, extension and improvement of the existing runway, property acquisition for clear zones and FBO expansion, and upgrading of roads, general operation and appearance provide the thrust of the development process.

The schedule of proposed development is based on near, intermediate and long-range forecasts covering the periods 1974 to 1976, 1976 to 1980, and 1980 to 1990 respectively. This schedule takes into account the demand for aeronautical services and community compatibility in order to maximize facilities and revenues to justify the County's investment in the airport.

The following list of major projects is divided into the three development stages and each project is shown in its chronological order of accomplishment:



Development Stage — Near Term (1974 - 1976)

Figure V.1

Near Term 1974 - 1976

Items eligible for support:

I. Land -
Acquire property north of the existing airport in order to construct Runway 6L/24R and to provide necessary land for future aviation activities.

Acquire land southeast of the intersection of El Camino Real and Palomar Airport Road for purposes of clear zone.

Acquire an avigation easement on the hill obstructing the approach to Runway 24L which is located approximately one mile east of the runway.

II. Site Preparation -
Design, grading and drainage for the north runway system (6L/24R).

III. Approach Aids -
Complete the installation of the ILS on Runway 24L.

IV. Roads -
Design and construct south FBO area road system, including its intersection with the entrance road.

Items not eligible for support:

I. Site Preparation - Utilities
Install utilities in south FBO area.

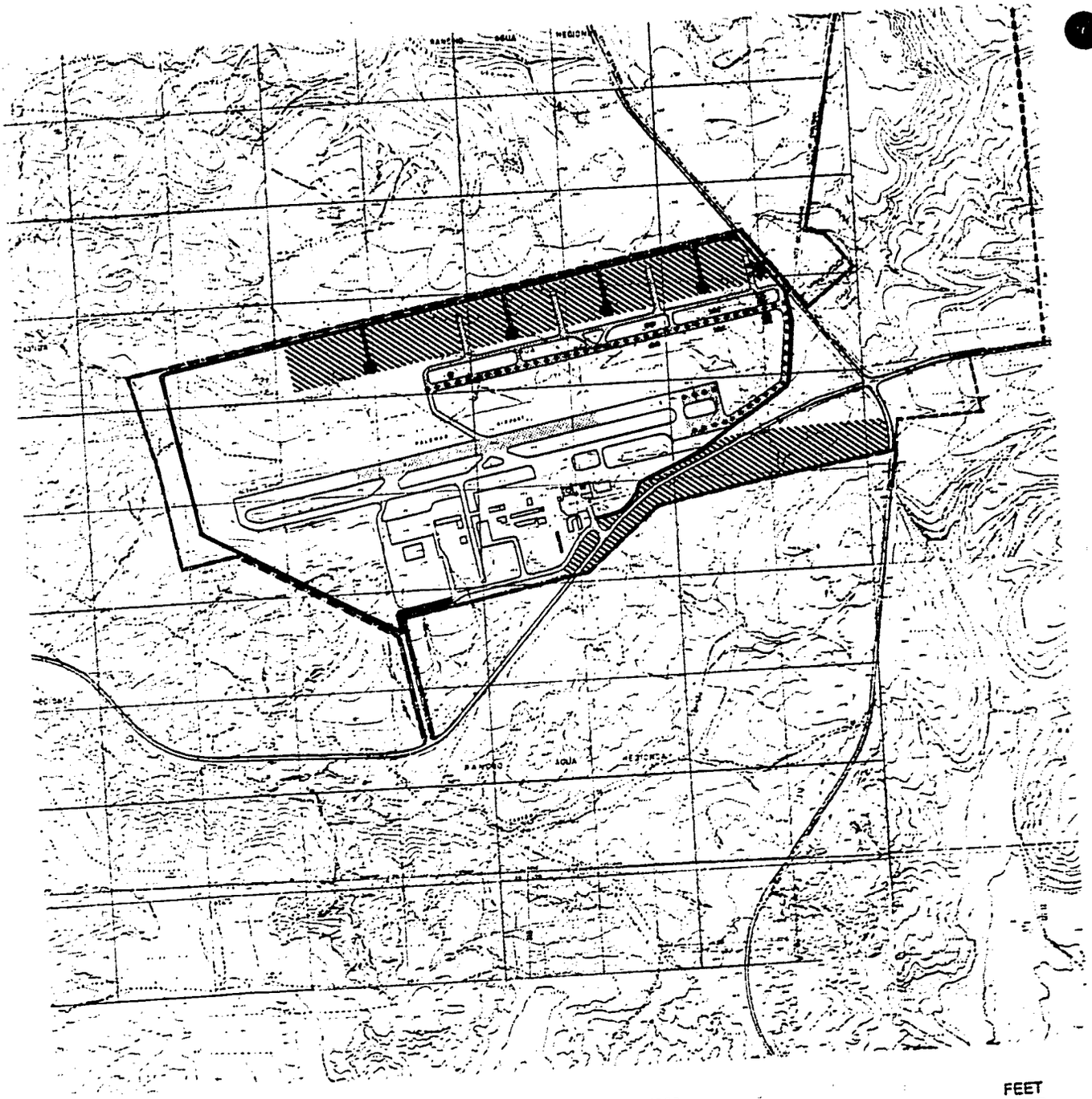
Intermediate Term 1976 - 1980

Items eligible for support:

I. Airport Paving -
Construct north runway/taxiway system (6L/24R).

Construct easterly taxiway connecting the runways.

Extend Runway 6R/24L and improve its effective gradient.



Development Stage — Intermediate Term (1976 - 1980)

Figure V.2

II. Site Preparation -

Design, grading and drainage for north FBO area.

III. Airfield Lighting -

Install MIRL system on Runway 6L/24R and associated taxiways.

Relocate Runway 24L threshold and approach lights, install centerline lights on the reconstructed runway, and extend taxiway lighting.

Install taxiway edge lights on easterly taxiway connector.

IV. Approach Aids -

Install REIL system on Runway 24R.

Install VASI system on Runway 24R.

V. Roads -

Construct north entrance road and complete the perimeter road system.

VI. Miscellaneous -

Install perimeter fencing.

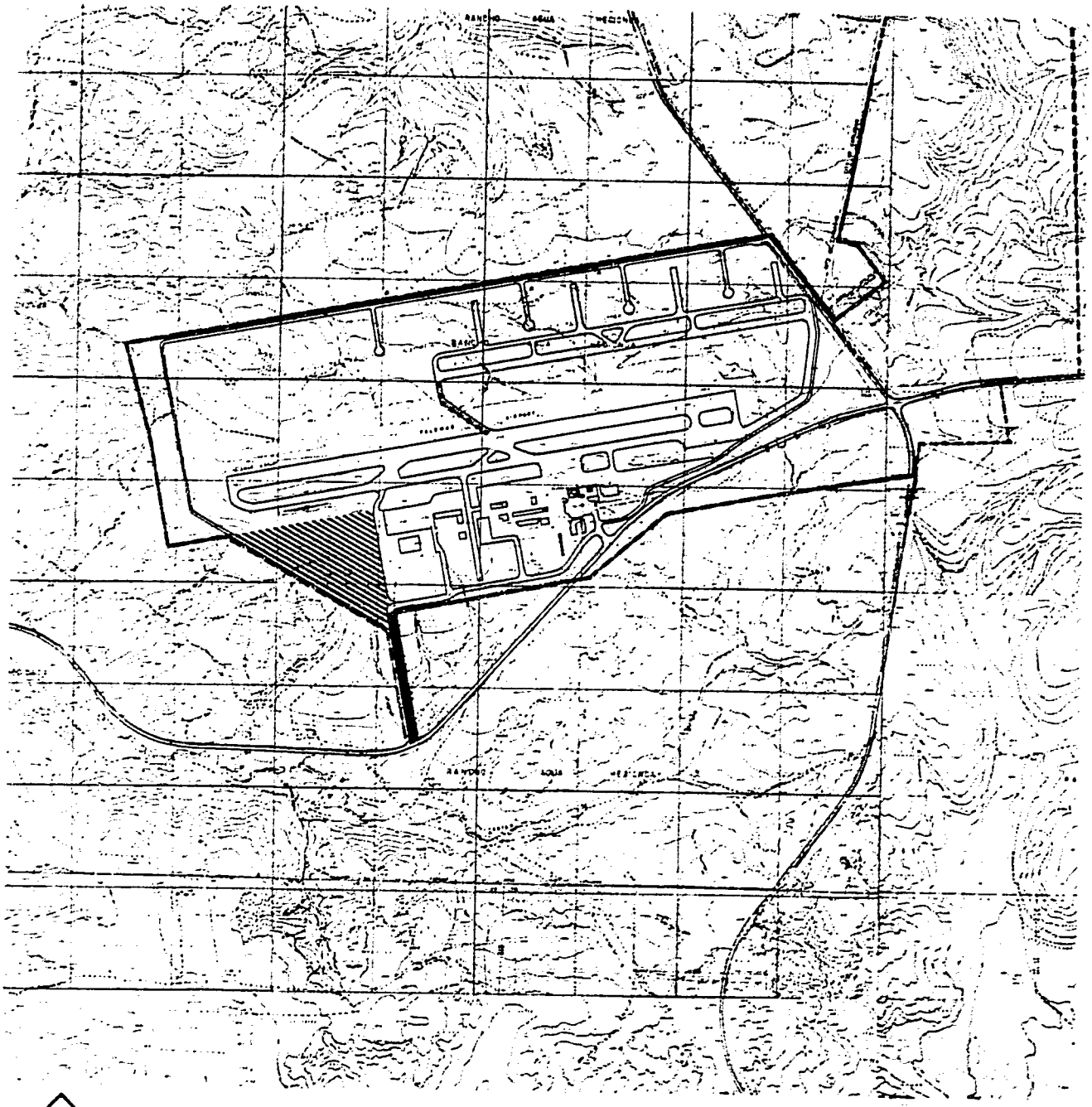
Construct Fire/Rescue Station.

Items <u>not</u> eligible for support:

I. Site Preparation -

Design, grading, drainage and utilities for Industrial/ Commercial areas.

Install utilities in north FBO area.



Development Stage — Long Term (1980 - 1990)

Figure V.3

Long Term 1980 - 1990

Items eligible for support:

I. Airport Paving -

Design and construct westerly taxiway connector.

II. Site Preparation -

Design, grading and drainage for future aviation area.

III. Airfield Lighting -

Install taxiway edge lights on westerly taxiway connector.

IV. Roads -

Design and construct additional entrance road from Palomar Airport Road to the future aviation area.

Items not eligible for support:

I. Site Preparation -

Install utilities in the future aviation area.

ESTIMATE OF COSTS (140)

Development costs estimated for the Master Plan program are tabulated by category and by fiscal year in Table 12. These expenditures are all based on 1974 costs without escalation.

TABLE 12 - REVISED MAY, 1976
PA[illegible]R AIRPORT
DEVELOPMENT COSTS (1975 DOLLARS) - THOUSANDS

PROJECT DESCRIPTION	NEAR TERM F.Y. 76/77	77/78	78/79	INTERMEDIATE TERM 79/80	80/81	81/82	82/83	
I. LAND								
Acquire Property for New R/W	1,776							
Acquire Property for Clear Zone - S.E.	162							
II. AIRPORT PAVING								
New Runway 6L/24R and Taxiway			635					
Connecting T/W - East End of R/W's				159				
Extend Existing R/W 6R/24L				240				
Improve Effective Gradient R/W 6R/24L					1,331			
Connecting T/W - West End of R/W's						54		
III. SITE PREPARATION								
Grading and Drainage new R/W		460						
Grading and Drainage FBO North		431						
IV. AIRFIELD LIGHTING								
Install MIRL New R/W 9L/27R				85				
Extend Lighting Existing R/W 24L				10				
Install Lighting Connecting T/W East				16				
Install Lighting Connecting T/W West						9		
V. APPROACH AIDS								
Install REIL New R/W 24R				10				
Install VASI New R/W 24R				10				
VI. ROADS								
Construct Road to South FBO Area		165						
Construct Road to North FBO Area			250					
VII. MISCELLANEOUS								
Perimeter Fencing				250				
Utilities North FBO Area			354					
TOTALS	1,938	1,056	1,239	780	1,331	63		= 6,407
Federal Participation (80%)	1,550	845	991	624	1,065	50		= 5,125
State Participation (*)	150	89	64	78	133	6		= 520
County Participation	238	122	184	78	133	7		= 762
							GRAND TOTAL	= 6,407

(*) • State Limited to 10% Funding if FAA Also Funds
• State Limited to $150,000/Year Per Airport
• State Will Not Participate in All Projects

JUN 8 1976 # 7

ECONOMIC FEASIBILITY (141)

Image of Palomar Airport

As has been the case with many airports on the "fringe" of urban growth, Palomar Airport is now beginning to realize its potential.

The development of the airport property requires additional land to meet future aviation demand and, therefore, promotion in accordance with the Master Plan should be actively pursued.

Aviation's Contribution to the Economy

The economy of the area surrounding an airport is influenced by the existence of the airport but is difficult to measure. The normal practice is to look at the airports' cash flow and not the other factors which are beneficial to the economy. For example, revenue and expense projections by the County for fiscal year 1974-1975 indicate that operating revenues will not cover operating expenses. Closer examination, however, shows that:

- Tenants using Palomar Airport as their base of operations generate $50,137 per year in sales tax revenues. Of these taxes, $10,000 can be allocated to the County.

- The Airport and its associated properties generate an annual payroll of over $2 million. Using the generally accepted income multiplier of 2.5 to 1, this $2 million payroll results in a $5 million annual contribution to the County's economic activity.

- Possessory interest taxes, currently amount to $34,000 per year.

- Personal property taxes from aircraft based at Palomar currently amount to approximately $50,000 per year.

It would appear that consideration of these facts in their true perspective shows Palomar Airport to be a positive economic influence on north San Diego County and particularly on its immediate neighborhood. (See Table 4, Chapter II.)

Capital Investment

The capital investment is shown in Table 12. The information is presented by major categories of investment and is also broken down to reflect items which are eligible for funding support by the FAA and others and items which are not eligible. The capital expenditures table is the primary input to the expense side of the financial

equation. Since it has been recommended that these expenses be paid on a current basis, they are shown as becoming due and payable during the year that the improvement is undertaken. As an alternative, it will of course be possible to reduce these outlays by paying interest only on the capital expenditures until such time as the revenues at the field can pay off the principal. The financial presentation included in this report uses the more conservative assumption of a "pay as you go" basis.

Development and Operating Cost Summary

This information is presented in Table 13, and should be read in conjunction with Table 12. It will be noted that land acquisition, site preparation, and aviation related improvements are the major items of development costs.

Table 13.

PALOMAR AIRPORT

DEVELOPMENT AND OPERATING COST SUMMARY
(Thousands of Dollars)

	ITEM	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83	83-84	84-85
I.	LAND	2450	156									
II.	AIRPORT PAVING			794	240		1331	54				
III.	SITE PREPARATION		460	431								111
IV.	AIRFIELD LIGHTING			101	10			9				
V.	APPROACH AIDS		130	12								
VI.	ROADS		165		250							477
VII.	MISCELLANEOUS			39			250					
VIII.	NON-ELIGIBLE				354	500						100
IX.	OPERATING COSTS	162	169	177	185	193	202	211	220	230	240	251
	TOTAL COSTS	2612	1080	1554	1039	693	1783	274	220	230	240	939

NOTES TO TABLE 13.

All items shown are in 1974 dollars.

Item IX. OPERATING COSTS. This item was derived by taking the actual 1972-1973 operating costs and increasing that budget by $4\frac{1}{2}$ percent per year. (This will not reflect inflationary trends). Revenue received by the County in the form of possessory interest and aircraft property taxes were assumed to more than offset inter-department charges within the County and are not reflected in this table.

Palomar Airport Revenues

The projected revenues of Palomar are presented in Table 14., and this table should be read in conjunction with the notes on the page following. It will be noted that both income and expense are in 1974 dollars. The FBO and general industrial lands are given an assumed value of $25,000 per acre with an annual return of seven percent on FBOs (fixed by Board of Supervisors resolution) or $1,350 per acre per year and ten percent on Industrial/Commercial land or $2,500 per acre per year in lease income. It is envisioned that recreational land will be leased on an "as is" basis without site improvements. This land should therefore provide net revenue of $1,000 per acre per year.

Table 14.

PALOMAR AIRPORT

REVENUES
(Thousands of Dollars)

ITEM	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83	83-84	84-85
LAND LEASE REVENUES											
1. FBO Direct Income	60	68	76	84	92	100	115	130	149	160	175
2. Industrial/Commercial Leases				120	18 160	35 200	53 200	68 200	68 200	68 200	68 200
3. Recreational Leases				204	270	335	368	398	417	428	443
SUB TOTAL	60	68	76								
OTHER REVENUE FEDERAL GRANTS (80%)											
4. Property Acquisition	1960	125	635	192		1065	43				89
5. Airport Paving		368	345				7				
6. Site Preparation			81	8							332
7. Airfield Lighting		104	10								
8. Approach Aids		132		200		200					
9. Roads			31								
10. Miscellaneous											421
SUB TOTAL	1960	729	1102	400	0	1265	50	0	0	0	21
11. State Grants	98	36	55	20	0	63	3	0	0	0	
TOTAL REVENUES	2118	833	1233	624	270	1663	421	398	417	428	885

NOTES TO TABLE 14.

All figures shown are in 1974 dollars.

Item 1. FBO LEASE INCOME. These numbers which include fuel flowage fees and tie down fees are based on the County's forecast figure for 1974-75. Beginning in 1975-76 it is assumed that the FBO acreage will be absorbed at an average of 5 acres per year until 1979-80 and 10 acres per year after 1980, and at an average revenue of $1,350 per acre per year. Fuel flowage was computed to reflect a 3¢ per gallon charge and volume is forecast to increase at a rate of 5% per year. This absorption rate was based on the projected growth of aircraft based at Palomar Airport. Clarification of the energy crisis and its implications may require adjustments in these absorption rates.

Item 2. INDUSTRIAL/COMMERCIAL LEASES. It is assumed that the industrial land will be absorbed at a rate of seven acres per year commencing in 1978-79 with an average revenue per acre of $2,500 per year. The demand for industrial acreage in the area is very strong however, two large tracts are presently underway which will tend to delay absorption of airport property except in those instances requiring close proximity to the airport itself. It is therefore assumed that this is a reasonable absorption rate for the industrial properties based on the need for aviation oriented Industrial/Commercial activities.

Item 3. RECREATIONAL LEASES. It is assumed that 120 acres will be leased in 1977-78 and 40 acres in the succeeding years of 1978-79 and 1979-80. It will be used for purposes compatible with its location so as to provide buffering between the airport and the community.

Item 4.-10. OTHER REVENUE-FEDERAL GRANTS. It is assumed that the FAA or other Federal, Regional or local agencies will pay for 80 percent of the eligible items related to the capital improvement program.

Item 11. STATE GRANTS. These grants are assumed to amount to five percent of the amount received from Federal grants. It is conceivable that this amount could be exceeded but for planning purposes five percent is recommended.

Cash Flow Summary

Table 15. takes the annual revenues and annual expenses from Tables 13. and 14. and derives an annual net cash flow position on a current year basis. The airport produces a profit commencing in 1980-81 and with the exception of 1984-85 should remain profitable thereafter. Palomar Airport should make a very substantial contribution to aviation and the economy in the County.

Table 15.

PALOMAR AIRPORT

FINANCIAL ANALYSIS

CASH FLOW SUMMARY

ITEM	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83	83-84	84-85
ANNUAL REVENUES	2118	833	1233	624	270	1663	421	398	417	428	885
ANNUAL EXPENSES	2612	1080	1554	1039	693	1783	274	220	230	240	939
NET ANNUAL POSITION	(494)	(247)	(321)	(415)	(423)	(120)	147	178	187	188	(54)

FINANCING AND IMPLEMENTATION (142)

The economic analysis and development program indicates that the proposed Master Plan is financially viable and can be implemented within the framework of the proposed implementation plan.

It will be immediately noted that the financial requirement is not large. This is the result of two factors. First, the largest single item of expense in the earlier program concerns land acquisition which was funded in 1974-75. Second, the relatively substantial amounts required for new runway construction and for lengthening the present runway have previously been eligible for federal assistance in an amount equal to slightly more than 50 percent of the cost involved. This percentage of Federal government support has recently been increased to approximately 80 percent. In addition, the State of California has funds available which could pay for up to one-half of the local obligation. Thus, while 80 percent value has been used for these items in the interest of a conservative approach, it is possible that the non-local funding of these eligible projects could approach 90 percent of the total cost.

Summary

Because of the revenue resulting directly from airport operation and the indirect revenues from sales taxes, possessory interest taxes and airplane personal property taxes, the improvements at Palomar Airport should be funded from the County General Fund. In addition, under strong and direct control of an Aviation Department, income and expense items generated by Palomar can be identified. Consideration of a Special Aviation Fund which will allow for the accumulation of revenue and unspent budget line items can be the means for providing continued development funding at the airport in conjunction with General Fund support.

The activation of a Palomar Airport Development Committee such as the one in operation at Gillespie Field will undoubtedly be of great assistance to airport management in proper promotion of the airport.

APPENDIX A

ACCESS PLAN

PALOMAR AIRPORT ACCESS STUDY

Prepared For

WILLIAM L. PEREIRA ASSOCIATES

BY

WILBUR SMITH & ASSOCIATES

January 1975

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TABULATIONS

ILLUSTRATIONS

Chapter 1

INTRODUCTION

Palomar Airport is a general aviation facility located in the northwestern portion of San Diego County approximately 4 miles southeast of the City of Carlsbad and 27 miles north of the City of San Diego. Figure 1 depicts the regional location of Palomar Field along with other aviation facilities within the regional boundaries described in Figure 1.

Locally, Palomar Airport is situated approximately 3 miles east of the interchange of Interstate Route 5 (I-5) with San Diego County Route S-12 (Palomar Airport Road). The airport property lies primarily northwest of and adjacent to the intersection of San Diego County routes S-11 (El Camino Real) and S-12 (Palomar Airport Road).

The North County region of San Diego County is one of the most rapidly growing areas in California. Based upon its geographic location between two expanding metropolitan centers, Los Angeles and San Diego, its pleasant climate and scenic topography, San Diego's North County growth is projected to accelerate for many years to come. Correspondingly, the demand for general aviation is projected to parallel the forecasted growth of the region.

Authority and Purpose of the Study

The County of San Diego has retained the firm of William L. Pereira Associates to develop the Master Plan for the expansion of general aviation facilities at Palomar Airport. The airside and

REGIONAL LOCATION MAP – PALOMAR AIRPORT

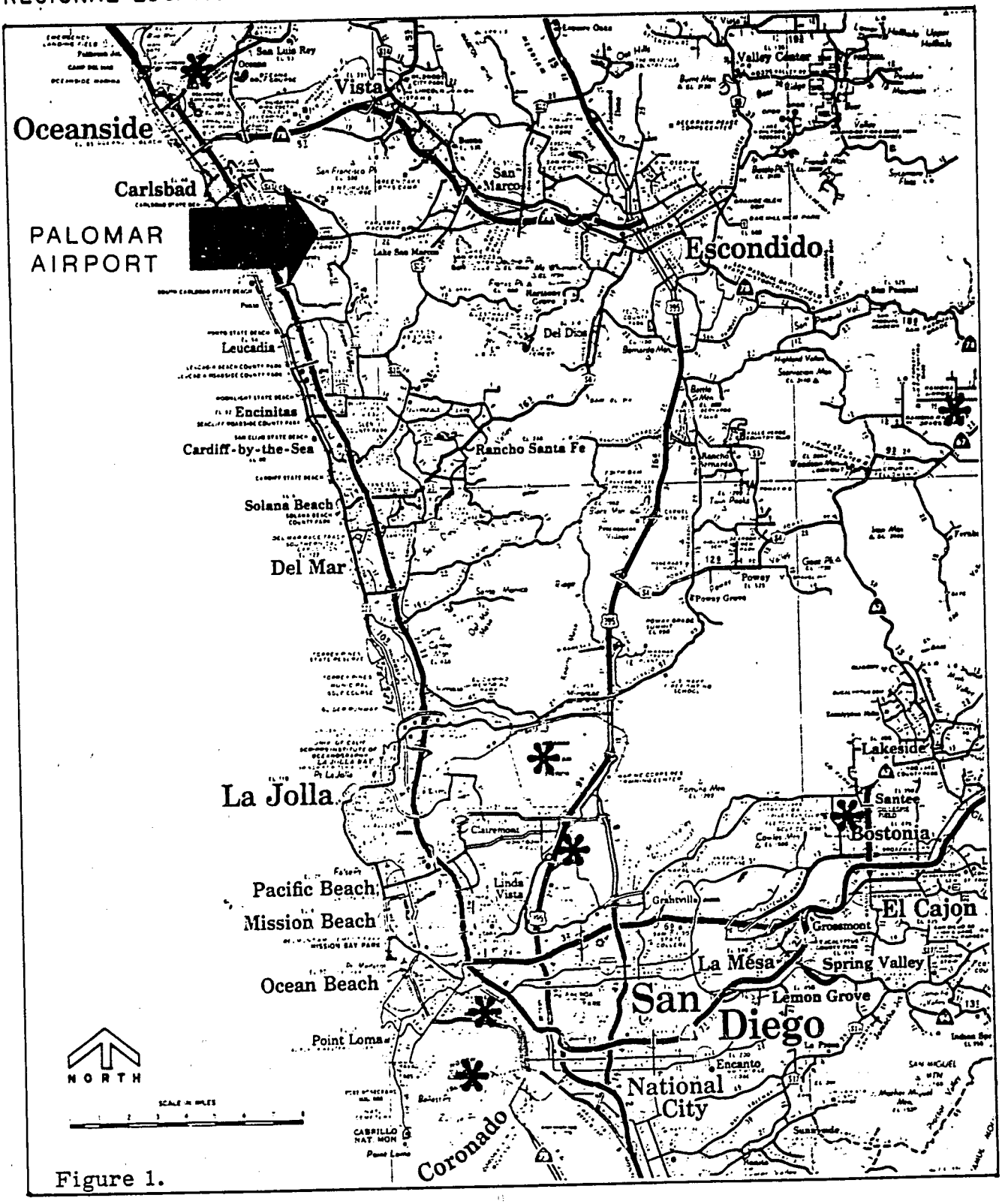

Figure 1.

ground access improvements are to be designed to accommodate a projected 613 based aircraft and an associated 402,000 annual operations in the year 1990.

This traffic and access study has been authorized by William L. Pereira Associates for the County of San Diego to develop future circulation, parking, and access improvements for integration with the development and expansion plans being prepared by the project architect.

The purpose of the study, therefore, was to develop a recommended access plan based upon general aviation demand forecasts for the year 1990, upon a broad data base of existing traffic volume and operational parameters gathered specifically for Palomar Airport by Wilbur Smith & Associates, and upon relationships between general aviation activity and ground travel activity developed by Wilbur Smith & Associates from previous studies of similar general aviation facilities in San Diego County and other areas.

Study Approach and Work Program

The ground transportation planning program for Palomar Airport was organized into two phases of analysis. The first phase identifies the transportation system requirements of the airport including the existing and projected airport population components and travel parameters. The second phase involved the development of a ground access, parking, and circulation plan to satisfy the projected 1990 general aviation activity demand forecast.

The work program utilized, extended, amplified, and organized the preceding objectives and study approach into a series of work tasks. The basic steps of the work program were as follows:

1. Inventory of existing conditions including analysis of previous studies, access, circulation, and parking characteristics;

2. Development of Airport Requirements and Planning Criteria;

3. Projection of future ground travel activity from general aviation activity demand forecasts; and

4. Development of a Recommended Access Plan.

Recommended Access Plan

The recommended access plan has been developed utilizing existing travel characteristics and a projected general aviation demand of 613 based aircraft and approximately 402,000 annual operations in 1990.

The ground transportation system will adequately accommodate the projected ground travel activity at Palomar Field. The recommended plan compliments the proposed airside expansion plans and provides for improved traffic, parking, and circulation activity in the Palomar Airport area.

The site plans for the Palomar Airport complex, as for other projects of this magnitude, are necessarily subject to continued refinement. The impact of these refinements on access and parking requirements may be appraised from the data set forth in this report.

Chapter 2

PRESENT TRAFFIC CONDITIONS

Palomar Airport is served by one major Interstate route and two major county routes which provide reasonably good accessibility to the site.

Existing Roadways

The local access network serving Palomar Airport is depicted in Figure 2, while a description of the major roadways follows:

Interstate Route 5 (I-5) - Interstate Route 5 is a major north-south multi-lane freeway facility providing regional access to Palomar Airport via an interchange with Palomar Airport Road (San Diego County Route S-12) approximately 3 miles west of the airport. Airport users from along the coastal corridor would utilize I-5 for immediate access to Palomar Airport Road and Palomar Field.

El Camino Real (San Diego County S-11) - El Camino Real is a five lane (four lanes plus left turn pockets) north-south roadway which roughly parallels Interstate Route 5, approximately 1 to 3 miles easterly, between Encinitas and San Luis Rey. As a result this facility offers an alternate north-south approach to Palomar Field to that provided by Interstate 5. Airport users favoring more leisurely travel on a less heavily traveled and lower speed facility would likely approach Palomar Field on El Camino Real rather than on I-5. El Camino Real interchanges approximately 5 miles north of the airport with State Route 78, which connects I-5 near Carlsbad with the communities of Vista, San Marcos, and Escondido.

LOCAL ACCESS NETWORK – PALOMAR AIRPORT

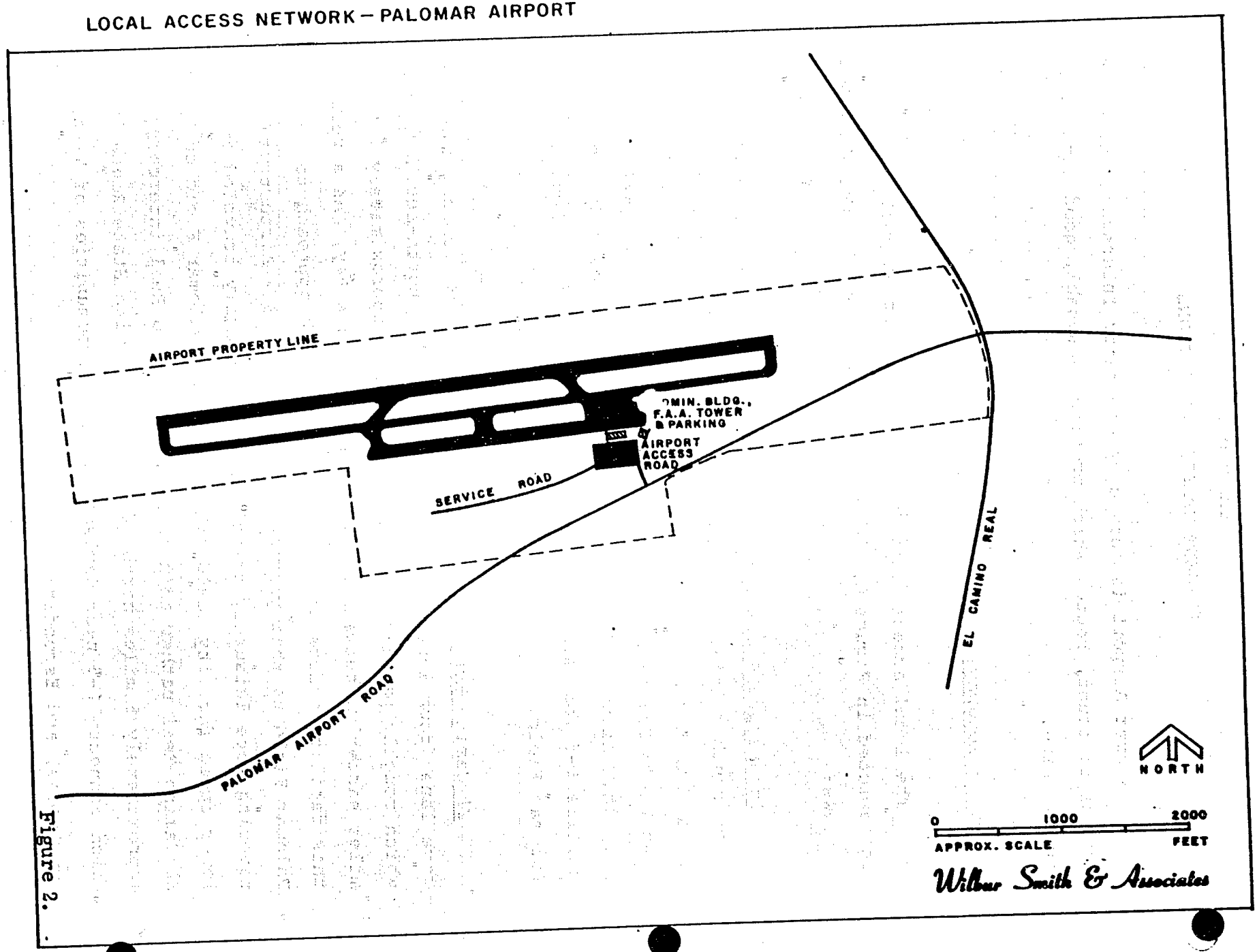

Figure 2.

Palomar Airport Road (San Diego County Route S-12) - This east-west county route is primarily a two-lane roadway connecting Interstate 5, approximately 2 miles south of Carlsbad, and State Route 78 near the community of San Marcos. Palomar Airport Road has been widened to four travel lanes between S-11 and the Palomar Airport Access Road in the site environs.

Traffic Controls

There are no traffic signalized intersections within the site environs. The Palomar Airport Road (S-12) and El Camino Real intersection, located approximately 2,500 feet east of the Palomar Airport Access Road, is a four-way stop. Vehicles exiting Palomar Field from Palomar Airport Access Road are controlled by a stop sign at the approach to Palomar Airport Road.

Traffic Volumes

The latest information regarding street traffic volumes for access roadways serving the Palomar Airport were obtained from the San Diego County Traffic Engineering Department. A summary of twenty-four hour and peak hour traffic volumes for the major access routes serving Palomar Field are presented in Table 1.

As indicated in Table 1, the heaviest traffic volumes recorded in the site environs occurs predictably on Interstate 5 near the Palomar Airport Road overcrossing. At that location I-5 is handling approximately 56,000 vehicles daily with an associated peak hour volume of 4,800 vehicles. El Camino Real, near the airport, is carrying approximately 6,150 vehicles daily with a peak hour volume of 610 vehicles. Traffic on a daily basis is equally balanced directionally, with 3,080 vehicles northbound and 3,070 vehicles

Table 1

EXISTING TWENTY-FOUR HOUR/PEAK HOUR TRAFFIC VOLUMES

Palomar Airport Access Roadways

ROADWAY	LOCATION	NUMBER OF LANES	24-HR. VOLUME	PEAK HOUR VOLUME
Interstate Route 5	Palomar Airport Road	8	56,000	4,800
El Camino Real (S-11)	S/O Palomar Airport Road	4	6,150	610
Palomar Airport Road (S-12)	E/O Palomar Airport Access Road	4	3,600	400
	W/O Palomar Airport Access Road	2	3,460	375

southbound on an average day. Palomar Airport Road, west of El Camino Real, is handling 3,600 vehicles and 3,460 vehicles daily east and west of the Palomar Airport Access Road, respectively. Peak evening hour traffic volumes at these locations are 400 and 375 vehicles, respectively.

Since traffic volumes internally at Palomar Field were not available from County of San Diego agencies, Wilbur Smith and Associates conducted supplementary field traffic counts during April 1973 to complete the necessary traffic volume data base. Twenty-four hour traffic volume counts were conducted on the Palomar Airport Access Road slightly north of Palomar Airport Road between Wednesday, April 25, 1973 and Sunday, April 29, 1973. The results of that extensive hourly traffic count are shown in Table 2. As indicated, traffic volumes (total both directions) varied from a low of 632 vehicles daily on April 27, 1973 to a

Table 2

TWENTY-FOUR HOUR TRAFFIC VOLUMES

Palomar Airport Access Road
(4/25/73-4/29/73)

HOUR ENDING	4/25/73 WEDNESDAY	4/26/73 THURSDAY	4/27/73 FRIDAY	4/28/73 SATURDAY	4/29/73 SUNDAY
1:00 A.M.		0	0	2	-(2)
2:00 A.M.		0	1	1	0
3:00 A.M.		1	0	0	0
4:00 A.M.		0	0	0	2
5:00 A.M.		1	1	1	0
6:00 A.M.		4	5	0	0
7:00 A.M.	334(1)	29	27	15	11
8:00 A.M.		41	34	38	27
9:00 A.M.		37	29	40	26
10:00 A.M		51	42	37	35
11:00 A.M.		48	31	56	48
Noon		53	35	55	38
1:00 P.M.		45	51	55	82
2:00 P.M.	56	31	49	57	81
3:00 P.M.	67	52	72(3)	62(3)	92(3)
4:00 P.M.	81(3)	77(3)	67	48	92(3)
5:00 P.M.	73	58	53	58	86
6:00 P.M.	56	33	46	58	67
7:00 P.M.	50	30	30	44	
8:00 P.M.	22	25	16	22	
9:00 P.M.	13	12	17	14	124(1)
10:00 P.M.	8	22	14	13	
11:00 P.M.	7	20	10	6	
Midnight	5	6	2	6	
TOTALS	772	676	632	688	811

(1) Estimated
(2) Change from Pacific Standard Time to Pacific Daylight Time.
(3) Peak Hour

a high of 811 vehicles daily on Sunday, April 29, 1973. The highest hourly traffic volume recorded for the five-day period was 92 vehicles between 3:00-4:00 P.M. on a Sunday. As indicated, the period between noon and 5 P.M. on Sunday recorded the highest sustained hourly traffic volumes, as 433 vehicles (total both directions) traveled this roadway section during those hours.

The results of a directional traffic count conducted on the Palomar Airport Access Road between 1:00 P.M. Wednesday, April 25, 1973 and 1:00 P.M. Thursday, April 26, 1973 are shown in Table 3. As indicated, traffic volumes directionally for this twenty-four hour period are nearly balanced with 358 vehicles and 390 vehicles recorded inbound and outbound, respectively. The heaviest flux of vehicles outbound occurred between 3:00 and 6:00 P.M. with 38 per cent of all outbound movements occurring during those three traffic hours. These same three traffic hours were the highest volume hours for total traffic movement at this location, accounting for nearly 30 per cent of daily vehicular activity.

Table 4 summarizes a twenty-four hour traffic count conducted at the aircraft taxiway crossing on the Palomar Airport Service Road. As shown in Table 4, 459 vehicles (total both directions) were recorded between 2:00 P.M. Thursday, April 26, 1973 and 2:00 P.M. Friday April 27, 1973. This corresponds to a 24 hour traffic volume of 640 vehicles on the Palomar Airport Access Road during the same time interval. Twenty per cent of daily traffic volume at this location occurred during the two highest traffic hours, 4-6 P.M.

Traffic Growth

Traffic growth on the two major county routes within the study area during the period between 1970 and 1974 has progressed at a

Table 3

TWENTY-FOUR HOUR DIRECTIONAL TRAFFIC VOLUMES

Palomar Airport Access Road

(4/25/73 - 4/26/73)

HOUR ENDING	INBOUND		OUTBOUND		TOTAL	
	Volume	Percent (1)	Volume	Percent (1)	Volume	Percent (1)
2:00 P.M.	21	5.9	35	9.0	56	7.5
3:00 P.M.	40 (2)	11.2	27	6.9	67	9.0
4:00 P.M.	29	8.1	52 (2)	13.3	81 (2)	10.8
5:00 P.M.	24	6.7	49	12.6	73	9.8
6:00 P.M.	9	2.5	47	12.1	56	7.5
7:00 P.M.	18	5.0	32	8.2	50	6.7
8:00 P.M.	11	3.1	11	2.8	22	2.9
9:00 P.M.	7	2.0	6	1.6	13	1.7
10:00 P.M.	4	1.1	4	1.0	8	1.1
11:00 P.M.	3	.8	4	1.0	7	1.0
Midnight	2	.6	3	.8	5	.7
1:00 A.M.	0	0.0	0	0.0	0	0.0
2:00 A.M.	0	0.0	0	0.0	0	0.0
3:00 A.M.	1	.3	0	0.0	1	.1
4:00 A.M.	0	0.0	0	0.0	0	0.0
5:00 A.M.	1	.3	0	0.0	1	.1
6:00 A.M.	4	1.1	0	0.0	4	.5
7:00 A.M.	27	7.5	2	.5	29	3.9
8:00 A.M.	39	10.9	2	.5	41	5.5
9:00 A.M.	22	6.1	15	3.8	37	4.9
10:00 A.M.	33	9.2	18	4.6	51	6.8
11:00 A.M.	25	7.0	23	5.9	48	6.4
Noon	16	4.5	37	9.5	53	7.1
1:00 P.M.	22	6.1	23	5.9	45	6.0
TOTALS	358	100.0	390	100.0	748	100.0

(1) Hourly Percent of 24 Hour Total
(2) Peak Hour

Table 4

TWENTY-FOUR HOUR TRAFFIC VOLUMES
Palomar Airport Service Road (1)

HOUR ENDING	VEHICLE VOLUME	
3:00 P.M.	24	Thursday, 4/26/73
4:00 P.M.	46	Peak Hour
5:00 P.M.	43	
6:00 P.M.	26	
7:00 P.M.	34	
8:00 P.M.	30	
9:00 P.M.	5	
10:00 P.M.	20	
11:00 P.M.	19	
Midnight	1	
1:00 A.M	0	Friday, 4/27/73
2:00 A.M.	1	
3:00 A.M.	0	
4:00 A.M.	0	
5:00 A.M.	5	
6:00 A.M.	1	
7:00 A M.	27	
8:00 A.M.	19	
9:00 A.M.	20	
10:00 A.M.	18	
11:00 A.M.	20	
Noon	33	
1:00 P.M.	36	
2:00 P.M.	31	
TOTAL	459 (2)	

(1) At Aircraft Taxiway Crossing.

(2) Corresponds with a 24 hour total of 640 vehicles on the airport access road during the same time interval.

rapid rate. Table 5 depicts traffic volumes on I-5, El Camino Real, and Palomar Airport Road, for the years 1970, 1972, and 1974. As indicated, El Camino Real traffic volumes have increased from 1,830 to 6,150 vehicles daily between 1970 and 1974. This represents an average annual increase of nearly sixty (60) per cent. However, between 1973 and 1974 the annual growth rate subsided to eleven (11) per cent.

Palomar Airport Road traffic volumes increased from 2,490 daily vehicles in 1970 to 3,460 daily vehicles in 1974, an average annual increase of nearly twelve (12) per cent. Similar to El Camino Real the average annual increase between 1973 and 1974 has decreased to an 8.8 per cent level.

Interstate 5 average annual daily traffic volumes have increased from 42,000 vehicles in 1970 to 56,000 vehicles in 1974. This represents an average annual increase of eight (8) per cent. However, no percentage increase occurred between 1973 and 1974, a condition attributed to the energy crisis.

Table 5

TRAFFIC GROWTH

Palomar Airport Access Roadways

ROUTE	1970 ADT	1972 ADT	1974 ADT	PER CENT GROWTH 1970-1974
I-5 (S/O Palomar Airport Road Overcrossing)	42,000	50,000	56,000	33
El Camino Real	1,830	3,370	6,150	236
Palomar Airport Road	2,490	2,780	3,460	47

Volume/Capacity Comparison

Before it is possible to determine whether the existing street network serving the proposed site will be able to accommodate the additional traffic generated by the expanded Palomar Airport complex, the ability of the street system to accommodate existing traffic must be measured. Traffic capacity is a term which expresses the ability of a roadway to carry traffic. On a city street the intersection is the largest single factor that reduces street traffic capacity. The principle factors that tend to reduce traffic flow at intersections are: 1) traffic signals, 2) turning movements, 3) pedestrians, 4) parked vehicles, 5) slow-moving commercial vehicles, and 6) pavement or intersection geometric conditions.

The type of traffic flow associated with a given section of the roadway can be classified by the "level of service" ranking.(1) Level of service classifications range over six categories, A through F. A represents a high level of service, free uninterruped traffic flow; while F represents the worst level of service, forced low speed traffic flow.

Level of service C is the level typically associated with urban design practice. At this level of service, stable flow, drivers may occasionally have to wait through more than one red signal indication, and backups may develop behind turning vehicles.

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(1) Highway Research Board, Highway Capacity Manual, Special Report 87, Washington, D.C., 1965, pg. 75-87.

As the peak hour volume/capacity ratio approaches 1.0, delays increase. A volume/capacity ratio greater than 1.0 signifies that the approach is operating above capacity with practically 80 per cent of all vehicles waiting through more than one cycle. Capacity analysis at an intersection is an important tool to measure the overall effectiveness of a roadway since intersection capacity governs the overall flow of traffic.

Volume/capacity comparisons were performed at two locations, Interstate Route 5 near the Palomar Airport Road interchange and at El Camino Road and Palomar Airport Road. At both locations a peak hour capacity surplus exists. At service level "C" a twenty five (25) per cent capacity surplus exists on Interstate 5. At the four way stop at El Camino Real and Palomar Airport Road, during the peak hour, present demand of approximately 1,250 vehicles per hour is significantly below the available capacity of 3,500 vehicles per hour.

Roadway Improvement Plans

Responsible personnel in the San Diego County Highway Design section and in the City of Carlsbad were contacted regarding proposed short or long range planning for Palomar Airport Road and El Camino Real in the site environs. According to San Diego County Engineering Department sources, there are no further improvements planned for El Camino Real or Palomar Airport Road, in the vicinity of the site within the existing six-year capital improvement program. Three years ago the County improved El Camino Real to a four lane divided roadway with left turn pockets at Palomar Airport Road.

Officials in the Engineering Department of the City of Carlsbad indicate that efforts to improve Palomar Airport Road within the City continue to have funding difficulties, therefore, future plans are unclear. In the ultimate long range plan both El Camino Real and Palomar Airport Road are scheduled to be six lane median-divided roadways.

Chapter 3

PROJECTED TRAFFIC VOLUMES

In order to evaluate the impact of the expanded general aviation facilities development proposed in the 1990 Master Plan for Palomar Airport on the surrounding street and highway network, it was necessary to develop and analyze future highway traffic. Traffic volume for all the proposed developments within the Palomar Airport property were calculated and superimposed on the future highway traffic projected for the area. The adjacent street and highway network was then analyzed as to its ability to adequately handle the increased traffic.

General Aviation Demand Forecast

It has been established from airport studies at Gillespie Field and other general aviation facilities in the Southern California area that traffic generation is directly related to the number of based aircraft. Therefore, it was necessary to develop an accurate demand forecast of the number of based aircraft expected at Palomar Airport for the 1990 design year.

Table 6 is a summarization of the expected growth in both based aircraft and number of annual general aviation operations for Palomar Airport as developed by Mitchell Research Associates for this study. The trends presented are based on current activity and available demographic data reflecting the expected growth in the area.

Table 6

PROJECTED GENERAL AVIATION DEMAND

Palomar Airport

YEAR	NUMBER OF BASED AIRCRAFT	NUMBER OF ANNUAL OPERATIONS
1973	191.	201,000
1975	207.	232,000
1980	290.	259,000
1990	613.	402,000

SOURCE: Mitchell Research Associates

As indicated in Table 6, during 1973 Palomar Airport had approximately 191 based aircraft, including helicopters operating at the Hughes installation, with an associated 201,000 annual operations. It is projected that by 1990 there will be 613 based aircraft with an associated 402,000 annual operations at Palomar Airport.

General Aviation Trip Generation Rates

Based on detailed traffic and employment data collected at Palomar Airport, an analysis was conducted to establish a meaningful correlation between vehicle traffic generation and itinerant and local general aviation operations. The purpose of this correlation analysis was to establish a suitable equation for determining vehicle traffic generation as a function of the type and number of aircraft operations. A number of models were investigated, however, none were found suitable to predict the observed vehicle

traffic with any degree of accuracy. Therefore, it was concluded another technique must be developed for generating general aviation related vehicle traffic.

The method devised established a traffic generation rate developed from based aircraft and vehicular volume data observed at Palomar Airport and other general aviation fields. After analysis relative to the aircraft operations and observed maximum general aviation related traffic, it was concluded that a typical aircraft operational Sunday in July or August would generate 1,000 vehicle trips for the approximately 200 aircraft located at Palomar Airport. This corresponds to a generation rate of 5.0 vehicle trips per based aircraft. Furthermore, the total number of vehicle trips (1,000) corresponds to a quantity approximately 25 per cent higher than that observed during a 5-day period in April 1973 at Palomar Airport.

Traffic Distribution

The distribution of traffic from the airport property to the surrounding roadway network was developed based upon an analysis of the areal location of based aircraft owner residences for 1990, derived for this study by Mitchell Research Associates. This analysis stipulated the number of private party based aircraft and the associated community residence of the aircraft owners. It has been projected that 402 of the total 613 based aircraft in 1990 will have private party ownership within San Diego County. An additional 31 based aircraft, or approximately 5 per cent, will have owners who reside outside of San Diego County. The remainder of the 613 based aircraft are composed of 149 Fixed Based Operators and 31 helicopters.

Based upon this geographical owner distribution data base, traffic was assigned to the individual roadways assuming motorists would seek the shortest, most convenient route to and from Palomar Airport from their residence location. The estimated directional distribution derived from this analysis is shown in Table 7.

Table 7

ESTIMATED APPROACH DISTRIBUTION - 1990

Palomar Field

APPROACH ROUTE	PER CENT OF TOTAL
El Camino Real (Southbound) (North of Palomar Airport Road)	20
El Camino Real (Northbound) (South of Palomar Airport Road)	6
Palomar Airport Road (Eastbound) (West of Airport Access Road)	33
Palomar Airport (Westbound) (East of El Camino Real)	41
TOTAL	100

As shown in Table 7, approximately 41 per cent of general aviation related trips would approach Palomar Airport from the east on Palomar Airport Road, east of El Camino Real. This occurs because of a heavy concentration of origins in Escondido and San Marcos. Approximately 33 per cent of expected general aviation related traffic is projected to approach Palomar Airport from the west, an additional 20 per cent from the north, while only 6 per cent is anticipated to approach from the south.

Projected Land Use

Palomar Airport is a general aviation airport which in 1973 reported 191 based aircraft and 201,000 annual operations. Existing aviation related facilities on airport property consists of the airport administration-terminal building and F.A.A. control tower facilities. Additionally, there are several Fixed Base Operators located south and west of the terminal area. A complete array of general aviation support services are provided on site including sales, rental, charter service, flight school, maintenance, fuel, and a cafe. Located at the extreme western end of the property is the Hughes Helicopter Test Facility.

The proposed 1990 Master Plan for Palomar Airport calls for significant development in general aviation facilities to handle a projected 613 based aircraft, more than three times the existing level. In order to accommodate the anticipated growth in based aircraft and annual operations, a new area, located north of the proposed second runway, will be developed with Fixed Base Operations. Other significant land use changes would involve the development of a recreational/buffer zone and an industrial/commercial sector, as shown in the Ultimate Land Use Plan.

Background Traffic Development

Future highway traffic in the site environs is comprised of aviation and non-aviation traffic generated by Palomar Airport, as well as background traffic generated by adjacent land uses within the influence sphere of the airport. Wilbur Smith and Associates contacted several planning agencies to obtain the most factual available future projected traffic assignments to site access roadways. The traffic study selected for use in the airport access analysis was conducted

in 1972 by San Diego County. This study developed future traffic volume assignments to site access roadways based upon the adopted 1967 San Dieguito Community Plan assuming saturated conditions. The projected 1990 traffic volume assignments from this study for site access roadways are summarized in Table 8 .

Table 8

1990 TRAFFIC VOLUME PROJECTIONS

Palomar Airport Access Roadways

ROADWAY	LOCATION	1990 PROJECTED TRAFFIC (ADT)
El Camino Real	N/O Palomar Airport Rd.	41,000
El Camino Real	S/O Palomar Airport Rd.	40,000
Palomar Airport Rd.	W/O El Camino Real	6,000
Palomar Airport Rd.	S/O El Camino Real	54,000

Source: San Diego County Engineering Study, 1972

The scope of work for this airport access study did not include the development and application of a 1990 traffic volume assignment study for external airport land uses within the Palomar Airport influence sphere. Therefore, it was necessary to utilize this historical study for background traffic assignments. However, it is important to note this San Diego County Study has certain limitations and weaknesses.

Because the northern boundary of this traffic study was Palomar Airport Road, the contribution from land uses north of this roadway were not adequately considered in developing traffic volume projections. Additionally, a new land use plan, with significantly higher land use densities, has recently been adopted for this region. These considerations, in addition to

pending industrial park development in the site environs totaling approximately 1,000 acres, suggest a re-evaluation of projected areal traffic volumes is needed. Therefore, it is recommended that a comprehensive traffic volume projection study be initiated jointly by San Diego County and the City of Carlsbad, which will generate assignments to existing roadways in this expanding North County area, which reflect recent land use intensity philosophies.

1990 Daily Traffic Generation

The trip generation rate for fixed base operations was developed from empirical data gathered at Palomar Airport. For each specific non-aviation oriented land use, a trip generation rate per acre was developed and applied.

Table 9 is a summarization of the projected 1990 daily trip generation charactrristics for Palomar Airport based upon the land uses in the airport master plan. As indicated, 3,065 daily trips are projected to be generated by general aviation related activities. Furthermore, because of the physical arrangements of FBO's on site, the trip origins north and south of the runway systems will be balanced. The industrial commercial land-use sector, for the most part, does not contribute traffic to internal circulation roadways. It has been assumed that this 27 acre (gross) parcel will be developed withlight manufacturing activities. Based upon empirical data from a San Diego Metropolitan Area Transportation Study, approximately 2,625 daily trips are projected. It must be recognized that the wide range of activities which could be developed on this parcel will have a more significant bearing on traffic generation than will general aviation related activities.

Table 9

PROJECTED 1990 DAILY TRIP GENERATION CHARACTERISTICS

Palomar Airport

LAND USE TYPE	GENERATOR	GENERATION RATE	TOTAL DAILY TRIPS
Fixed Base Operation	613 based aircraft	5.0/based aircraft	3,065
Industrial-Commercial	light manufacturing (21 net acres)	125/acre (net)	2,625
Recreational-Buffer	archery, ball fields, etc. (50 acres)	4/acre	200
		TOTAL	5,890

1990 Peak Hour Traffic Generation

Peak hour traffic volumes based upon total daily trips generated by the various land uses are shown in Table 10. The period during which auto traffic generated from the airport property will have the most critical impact on the adjacent street network and is projected to occur during the morning (7-8 AM) and evening (4-5 PM) peak highway traffic hours. The percentage distribution of daily trips assigned to the peak traffic hours for each land use category were based upon empirical data from previous studies conducted by Wilbur Smith and Associates at general aviation facilities and industrial-commercial complexes throughout Southern California.

As indicated in Table 10 approximately 825 peak morning hour inbound trips and 975 peak evening hour outbound trips are projected for the Palomar Airport complex. It is to be noted that approximately 20 per cent of these individual peak

hour volumes are general aviation related. Because of high morning and evening peaking characteristics associated with industrial-commercial activities it is apparent the precise extent of development in this land use sector significantly affects peak hour traffic generation. The specific impact of the peak hour traffic volumes shown in Table 10 must necessarily be evaluated in light of their distribution to various segments of the access system, in accordance with the traffic distribution developed for Palomar Airport. A daily and peak hour distribution of traffic to access roadways was made based upon grouping of vehicles to their specific land use origins or destinations and upon the developed traffic distribution. This type of analysis identifies projected traffic access deficiency areas and defines the scope of needed improvements to handle projected airport related demand.

Table 10

PEAK HOUR TRAFFIC GENERATION

Palomar Airport

LAND USE	7-8 AM PEAK HIGHWAY HOUR Inbound	Outbound	4-5 PM PEAK HIGHWAY HOUR Inbound	Outbound
Fixed Base Operations	165	15	105	195
Industrial-Commercial	650	70	90	760
Recreation-Buffer	10	3	7	20
TOTAL	825			975

1990 Projected Parking Requirements

Based upon empirical parking accumulation and turnover activity gathered by Wilbur Smith and Associates at Gillespie Field, Palomar Airport, and other general aviation airports in South-

ern California, parking requirements have been developed to satisfy the activity demands generated by the projected 613 based aircraft and their associated traffic generation characteristics for 1990. A summary of projected 1990 parking space requirements is shown in Table 11.

Table 11

PROJECTED 1990 PARKING REQUIREMENTS

Palomar Airport

LAND USE	PARKING SPACES
Fixed Base Operations	350
Industrial-Commercial	500
Recreation-Buffer	100
TOTAL	950

Chapter 4

RECOMMENDED ACCESS PLAN

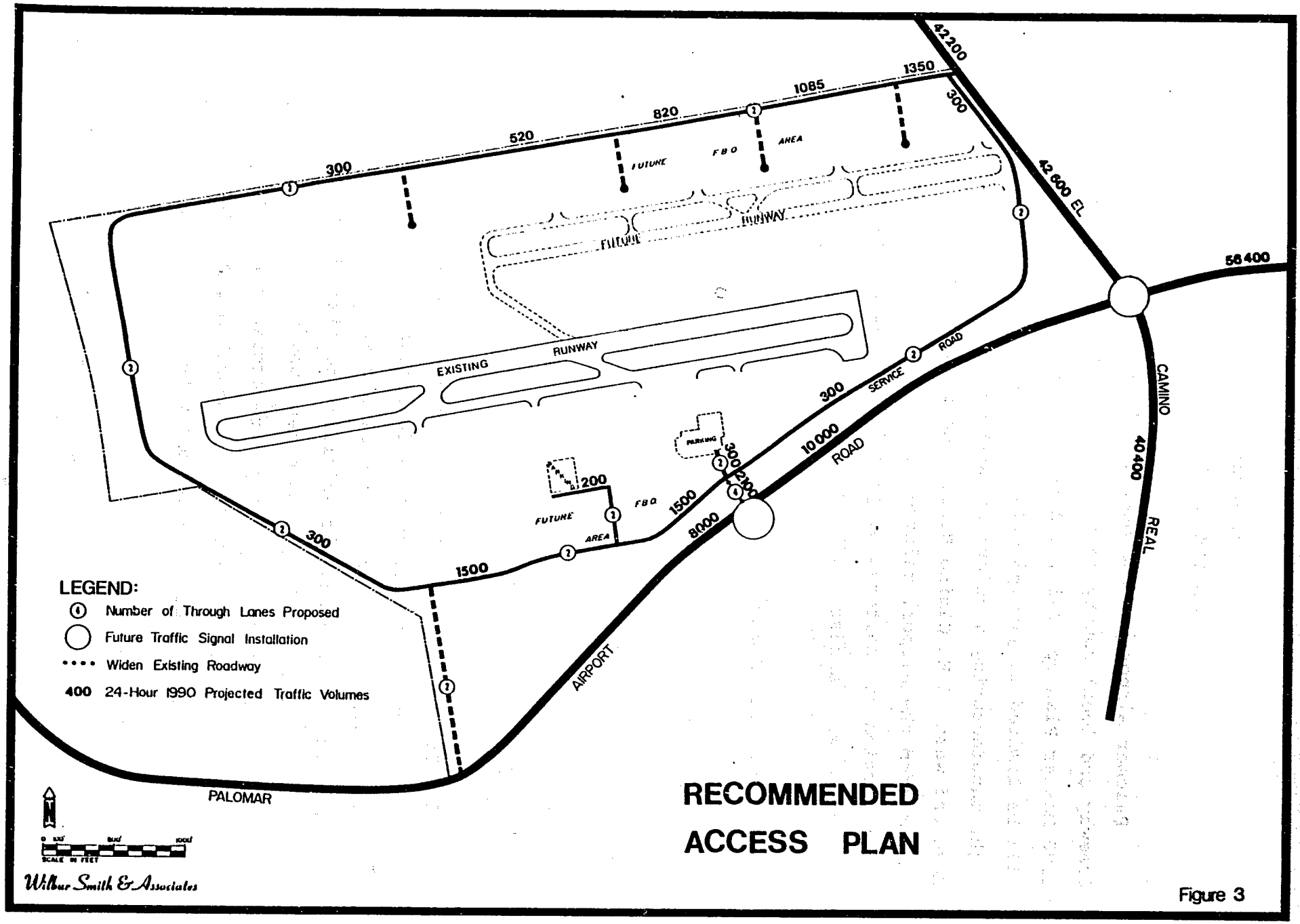
Palomar Airport is reasonably well located relative to freeway and local county route access. According to the 1990 Master Plan for Palomar Airport, activity at the airport will be limited to general aviation on site as well as minor light manufacturing development adjacent to Palomar Airport Road and west of El Camino Real. Accordingly, the contribution from the airport related activities will comprise a minor portion of the total projected 1990 future highway traffic on site access roadways.

Recommended Access Plan

The access plan for the recommended land use plan was developed considering development parking requirements, morning and evening peak hour traffic, and circulation requirements.

The recommended access plan contains the following major recommendations. (See Figure 3)

1. Provision for a loop access-service road to enhance circulation between site functions.
2. Provision for an additional access point from El Camino Real to enhance accessibility to fixed base operations adjacent to the proposed new runway.
3. Provision for a third future access point from Palomar Airport Road, to allow for possible long-range planning of commercial aviation activity.



RECOMMENDED ACCESS PLAN

Figure 3

4. Widening of Palomar Airport Road to four traffic lanes for additional storage capability on the egress approach.

The recommended access plan provides the planning requirements for the roadway system and traffic improvements necessary to accommodate projected 1990 traffic volumes at Palomar Field.

The plan will provide an increased level of service to general aviation and non-aviation related users. In view of the relatively low daily and peak hour traffic volume generated by airport related activities, when distributed to access roadways, major roadway improvements have not been recommended.

Given particular consideration in this traffic analysis was the need to provide signalization at one or both of the airport access points, or at Palomar Airport Road and El Camino Real. Based upon the 1990 projected traffic generated by airport related activities sustained hourly traffic volumes are not sufficient to justify or warrant traffic signalization in the site environs.

It is recognized that development of a large industrial tract south of Palomar Airport Road across from the existing airport entrance road is currently underway. Site plans for this tract include future signalization of the Palomar Airport Road/Palomar Airport Access Road intersection to permit efficient, safe movement of significant vehicular traffic to and from this industrial complex. The proposed widening of the airport access road will be compatible with this contemplated signalization.

Similarly, external airport land use development growth in the influence sphere of the airport will generate significant road-way traffic which will require future signalization at El Camino Real and Palomar Airport Road. Likewise, the development of a large industrial tract and refinery to the north of Palomar Airport, will undoubtedly create a need for signalization on El Camino Real near the airport north property line to adequately control access to this tract.

Evaluation of Future Transit Impact

The importance of transit within the total transportation network of San Diego County has been recognized by the Comprehensive Planning Organization and significant steps for the improvement of transit service and facilities have been undertaken. The Transit Development Plan and Program for the City of San Diego was completed in 1970, and outlined short-range operational improvement programs for San Diego transit.

At present, the Comprehensive Planning Organization is evaluating six alternative transit plans, including express and local bus improvements in the North County area. No fixed rail improvements are contemplated for the North Country. The plan review, adoption, and implementation process necessary to bring a transit system to Palomar Field requires comments from the C.P.O. Board of Directors, County Board of Supervisors, local Planning Commissions, management, engineering, and planning officials of the Region's several jurisdictions. In view of these facts, the high percentage of auto orientation assumed in developing the findings of this report will not be changed substantially in the foreseeable future.

If rapid transit is brought in to Palomar Field it should be connected to parking facilities on site. Recent studies at several U.S. airports have shown that aviation-oriented individuals who are confronted with a choice of transportation modes tend to use the faster and more convenient mode even if it costs more. However, there is a future potential for providing transit service to employees who will work at and adjacent to Palomar Field in Industrial and Commercial areas.

Conclusions

The studies of traffic and access in the environs of the proposed Palomar Airport 1990 Master Plan area indicate the need for certain access modifications, as shown in the Recommended Access Plan, if a reasonably adequate level of service is to be provided projected traffic. In general, the traffic volumes projected for airport related activities can be adequately handled without modifications to the external access system. Some minor congestion, in parking facilities and on access roadways, is to be anticipated during peak highway traffic hours, generally as a result of non-aviation related industrial-commercial activity within the airport property. Major access roadway improvements, including widening of both Palomar Airport Road and El Camino Real to their ultimate six lane roadway sections, and traffic signal installations, will result primarily from future growth of regional external high density land uses.

APPENDIX B

FAA CRITERIA LETTER

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

Airport Operations Branch
5885 West Imperial Highway
Los Angeles, California 90045

11 February 1970

Mr. D. K. Speer, Administrator
Public Works Agency
County of San Diego
5555 Overland Avenue, Building 2
San Diego, California 92123

Re: Gillespie Field
San Diego, California
Revised Airport Layout Plan

Dear Mr. Speer:

Reference is made to our previous conversations with Messrs E. H. C. Fredricks and W. P. Secor concerning the revision of the Airport Layout Plan (ALP) for Gillespie Field, San Diego, California. We are agreeable to postponing the revision until July 1970 provided an acceptable revision is available at that time.

Several months ago we received a copy of the report, "Development Program for Gillespie Field and the Edgemoor Property", by Arthur D. Little, Inc., concerning future development of Gillespie Field for our review and comment. We have reviewed the document and believe that a detailed reply relating only to the Little report could serve no practical purpose at this time. However, we do wish to make some general comments:

1. The report, as stated in the introduction, was to "provide an economical and financial evaluation of alternative land uses as a basis for a comprehensive development plan for county owned property at Gillespie Field and nearby Edgemoor." The basic recommendations (paragraph 2 of Summary) deal more with land use and development than with the aeronautical future of Gillespie Field. Our interest in the Edgemoor property concerns us only as it may affect aircraft flight operations to and from Gillespie Field.

2. Gillespie Field was transferred to the County of San Diego for airport purposes described more fully below:

   a. Surplus Federal property conveyed to local public agencies by a surplus airport instrument of transfer must be used for airport purposes. Consequently, the use of surplus property to generate revenues for the airport from non-aviation business activity is an authorized airport purpose.

Thus, any surplus Federal property conveyed under this act for airport purposes, if not actually needed for direct aeronautical use, must be used or available for use to generate revenues which must in turn be applied to the development, improvement, operations or maintenance of airport facilities. No other use of the property was contemplated by the law.

b. Airport Use Real Property (Aeronautical Property) is all property comprising the land, airspace, improvements and facilities used or intended for use for any operational purpose related to, in support of, or complementary to the flight of aircraft to or from the landing area. Aeronautical property is not confined to land areas or improvements eligible for development with Federal-aid Airport Program funds or acquired Federal property. In addition to the areas occupied by the runways, taxiways and parking aprons, aeronautical property includes any other areas used or intended to be used for supporting services and facilities related to the operation of aircraft. It also includes property normally required by those activities which are complementary to flight activity, such as convenience concessions serving the public including, but not limited to, shelter, ground transportation, food and personal services.

c. Revenue Use or Nonairport Use Real Property is all property described and dedicated in an airport agreement except airport use property as defined above, which is used or available for use to generate income from nonaviation business. At airports obligated under surplus property instruments of disposal, such property must be used to support the maintenance, operation or development costs of the aeronautical property, since no other authorized usage was contemplated by the statute. Therefore, since aeronautical use has priority your development plans must recognize this fundamental concept. Any use of the land shown as aeronautical on the ALP for other than this purpose must be approved by the FAA.

3. It is interesting to note that aviation forecasts are made through 1980, including a detailed breakdown. However, industrial development is forecasted through 1990. To objectively forecast aeronautical and industrial needs at Gillespie Field the same time span should be used. In the case at hand, aeronautical requirements beyond 1980 may be greater and of a different nature; therefore, to predicate the ultimate aeronautical requirements at Gillespie Field to be those estimated for 1980 and then consider the remainder of Gillespie Field available for industrial development is not considered valid nor objective.

Early in 1969 the publication, "Aviation Demand and Airport Facility Requirement Forecast for Medium Transportation HUBS Through 1980", was made available to the public by the FAA. San Diego is listed in this publication as a Medium Hub, the area of which includes the San Diego Standard Metropolitan Statistical Area (SMSA), geographically San Diego County. Included in this San Diego Hub Forecast is Gillespie Field. The forecasts of Aviation Activity and Airport Facility requirements are given for the entire Hub. Individual airport requirements are not identified. Therefore, that part of each forecast element relating to Gillespie Field must be determined by study or analysis.

In 1959 a study began to revise the ALP for Gillespie Field and provide suitable goals to meet the aeronautical needs for the foreseeable future. Except for minor revisions the basic layout proposed in 1959 and approved August 1960 has remained unchanged. With the completion of the parallel runway (9R/27L) and allied taxiways in October 1969, the bulk and most significant features of the 1959 study have been accomplished. With this in mind we consider a major revision of the ALP for Gillespie Field important at this time in order to provide for its aeronautical needs and requirements for the foreseeable future. Therefore, to assist you in the development of an ALP revision we are including in the subsequent paragraphs the various airport facility requirements for Gillespie Field according to our analysis. Our recommendations are based primarily on the above mentioned FAA Hub forecast for San Diego; however, we have considered elements of the Arthur D. Little Report and, in addition, have referred to other FAA publications and records as they may apply:

F.R.

1. Of primary importance in revising the ALP is the question of runway lengths. Extension of Runway 9L/27R is not considered necessary at this time. However, a modest extension to the west appears feasible if activity in using aircraft can justify the extension. Any extension would require some approach clearance on the north side of the existing west clear zone.

2. The distance between the existing runway centerlines will permit simultaneous VFR operations by lightweight single engine, propeller driven aircraft only. Extension of Runway 9R/27L will not improve simultaneous VFR operations procedures to permit larger aircraft to be accommodated. However, an increase to maximum length of a general utility runway should be considered for future development. This length is 3700' and should be made to the west. Affected taxiways will have to be modified accordingly.

3. We have completed an airport capacity study and find that the Practical Annual Capacity (PANCAP) for Gillespie Field is 405,000 operations per year. We wish to point out that this figure is considered conservative and is based on only a two minute delay during the weekly peak hour(s). Past experience has shown that while a significant increase in total annual operations, over and above PANCAP, may occur, significant delays are encountered, especially during peak hour operations. In addition, increased capacity results when daily operations are spread over a greater length of time and the difference between peak hour and average

hour operations is relatively small.

4. We are estimating approximately 800 based aircraft by 1980, which would require approximately 73 acres of apron and/or hangar development. Estimated apron development required for itinerant aircraft is 12 acres. Based on utilization of the present terminal apron, we suggest that six acres be planned for the terminal area and six acres included in the FBO apron requirements. Estimated acreage required for FBO office buildings, shops, auto parking, wash racks, fueling, etc., is 20% of the acreage required by based aircraft, or 15 acres. Apron requirements are based on space for 11 aircraft per acre whether tie-down or in T-hangars. Both methods will allow a modest increase in units per acre if future conditions dictate the need. Necessary apron taxiways and space for maneuvering is included in our 11 aircraft per acre figure. Total acreage for apron space, buildings, etc., in 1980 comes to 100 acres. This acreage is in addition to the land required for runways, taxiways and clear zones.

5. Although our estimates are for aeronautical activity anticipated by 1980, only ten years away, we considered the reservation of additional area to meet aeronautical needs which may develop beyond 1980 to be important. If, in the future beyond 1980, it develops that this additional area is not required then other uses can be assigned. In the meantime, short term uses may be assigned with the provision that future aeronautical development may require use of this area and the removal of structures or other development erected thereon.

6. We are enclosing a sketch showing our recommended development and airport configuration to meet 1980 requirements. We have also included certain parcels contiguous to the landing area we recommend to be retained for future development. Existing clear zones and approach areas should definitely be preserved. Any routing of the railroad around the west end of the main runways may be critical in order to maintain a minimum clearance of 25' over the tracks and allow for any future runway extension to the west. Rerouting of El Cajon Creek will also be required for obvious reasons. In this connection it would appear that a covered box section would be advisable, although it is recognized to be more expensive than construction of an improved open channel.

In our letter to Mr. C. F. Weiler dated 1 May 1968 we made extensive comments on the current approved ALP. These comments are still valid and should be considered in your revision, especially Comment No. 8 concerning Runway 17/35. A copy of this letter is enclosed for your ready reference.

In order to have an acceptable ALP by July 1970 we suggest a preliminary submittal at your earliest convenience. If you would like to have a conference or a meeting concerning the contents of this letter we will be most happy to meet with you at any time.

Sincerely,

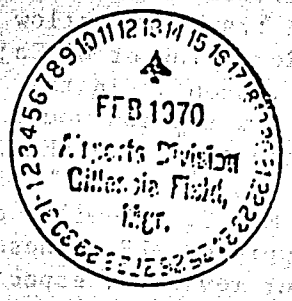
ORIGINAL SIGNED BY
CHARLES E. DRYSDALE

CHARLES E. DRYSDALE, Chief
Airport Operations Branch

Enclosures

cc: Mr. W. P. Secor
San Diego, California

Mr. H. G. Culver
Santee, California



APPENDIX C

FINANCIAL & ECONOMIC

DATA

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MITCHELL RESEARCH ASSOCIATES
INCORPORATED

525 B STREET • SAN DIEGO, CALIFORNIA 92101 • (714) 239-1313

November 1, 1974

William L. Pereira Associates
Urbanus Square
MacArthur Boulevard at Ford Road
Corona del Mar, CA 92625

Gentlemen:

Please find enclosed a reworked demand forecast methodology for Palomar Airport. It indicates approximately 400,000 operations by the year 1990 and 613 based aircraft for the same year.

Turning to PANCAP for the airport, we have reviewed the configuration you sent down to us. We estimate that this configuration can accommodate up to 400,000 operations per year. As you know, in actual experience these calculated figures are often exceeded but the 400,000 is a good planning number.

Please let me know if you have any questions or comments.

Very truly yours,

MITCHELL RESEARCH ASSOCIATES

George J. Mitchell, Jr.
President

GJM/sd

Enclosure

PALOMAR AIRPORT
DEMAND FORECAST METHODOLOGY

I. BASED AIRCRAFT

The North County region of San Diego County is one of the most rapidly growing areas in California. Based on its geographic location between two expanding metropolitan centers, its pleasant climate and scenic topography, San Diego's North County growth will continue to accelerate for many years to come. As a result of this forecasted growth and its economic composition, the demand for general aviation in the region will likewise expand.

The forecasts developed in this study of general aviation demand at Palomar are based on current activity and available demographic data reflecting the expected growth in the area. Current data on trends throughout San Diego County were obtained from the Comprehensive Planning Organization (CPO).

A careful inventory of aircraft presently based at Palomar was made to establish an accurate base from which to forecast. From contacts made with each fixed based operator and discussions with County airport operators, it was determined that approximately 190 aircraft are currently based at Palomar Airport. This count includes 31 helicopters operating at the Hughes installation on the north end of the airfield. Though the helicopter operations are conducted from pads at the Hughes facility,

the operations are cleared through the FAA tower.

Included in the inventory survey of based aircraft was a list of residences of owners of each aircraft based at Palomar. Using this list, each aircraft was assigned to one Subregional Area based on the owner's residence. Subregional Areas (SRA) are demographic divisions of San Diego County used by the County Planning Department and CPO. The 54 SRA's are groupings of 1970 census tracts based on community divisions. Subregional Areas were chosen as the forecasting denominator because they are of appropriate size to provide a meaningful regional general aviation forecast and they are a division used by the Comprehensive Planning Organization for population forecasts.

Palomar-based aircraft owners were found to reside in the following SRA's: Escondido, Del Mar-Mira Mesa, San Marcos, San Dieguito, Oceanside, Carlsbad, Coastal, Vista, Valley Center and Pendleton. In addition, several based aircraft owners reside in one of five SRA's in San Diego City. These aircraft were combined and forecast as a single San Diego group. Based aircraft owners residing outside of San Diego County were also forecasted separately. As would be expected, most of the based aircraft owners reside in SRA's immediately surrounding the Palomar Airport. Particularly important are Escondido, San Dieguito, Vista and Carlsbad.

Based on the number of aircraft owners residing in each appropriate SRA and the current population provided by CPO for each of the areas, an aircraft per 1,000 population factor was calculated for each Subregional Area

CORRECTION

To assure optimum legibility the preceding document and/or group of documents have been re-photographed and their images appear immediately hereafter.

COUNTY OF SAN DIEGO

Department of General Services

Central Records Service

County Operations Center, 5555 Overland Avenue, San Diego, California 92123

CRS 350 (11 74)

PALOMAR AIRPORT
DEMAND FORECAST METHODOLOGY

I. BASED AIRCRAFT

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Based on the number of aircraft owners residing in each appropriate SRA and the current population provided by CPO for each of the areas, an aircraft per 1,000 population factor was calculated for each Subregional Area

and for the San Diego region. Several adjustments were then made. For example, almost all aircraft owners listed in the Del Mar-Mira Mesa SRA reside in the City of Del Mar. So, the Del Mar census tract population forecasts were extracted from the Del Mar-Mira Mesa SRA and the aircraft forecast was based on this smaller Del Mar area. Mira Mesa is expected to grow much faster than Del Mar, and it is unlikely that the aircraft owners based at Palomar per 1,000 population would be nearly as high in Mira Mesa as in Del Mar. Montgomery Field is a more convenient airport for Mira Mesa residents, while the average household income is substantially higher in Del Mar. Likewise, La Jolla was separated from Pacific Beach and Mission Bay in the Coastal SRA for similar reasons.

Based on trends in growth of general aviation aircraft in the FAA Western Region[1/] and the known aircraft in San Diego County for 1973, a San Diego County forecast of based aircraft per 1,000 population was developed for 1973, 1975, 1980 and 1990. (See Table 1).

Table 1

GENERAL AVIATION AIRCRAFT
BASED IN SAN DIEGO COUNTY

	1972	1973	1975	1980	1990
Population (000)[2/]	1470	1502	1570	1791	2253
San Diego County Based A/C[3/]	1300	1352	1412	1736	2849
Aircraft/1,000 Population	.88	.90	.90	.97	1.26

1/ "Aviation Forecasts - Fiscal Years 1973-1984", FAA, September, 1972

2/ SANPAT Interim Report 1, Volume 3

3/ Based on 1973 as base year and growth forecasted by FAA for general aviation aircraft in the FAA Western Region, with extrapolations by Mitchell Research Associates as appropriate

The percentage increase in County aircraft per 1,000 population for each of the study years was applied to the aircraft based at Palomar per 1,000 population developed earlier for each of the North County Subregional Areas. Upon the completion of this step, factors have been developed that forecast the aircraft based per 1,000 population separately for each SRA for 1975, 1980 and 1990. These factors were applied to the CPO population forecasts for the appropriate Subregional Areas to give forecasts of resident Palomar-based aircraft for each SRA. The sum of these separate forecasts provides the total of Palomar-based aircraft owned by San Diego County residents for 1975, 1980 and 1990. (See Table 2).

Several aircraft currently based at Palomar are owned by non-residents of San Diego County. These owners lived in either Orange, Los Angeles or Riverside counties. These aircraft were forecasted to increase through the study period as a direct function of the population increases in the three counties and related to the San Diego County increase in aircraft per 1,000 population.

FBO aircraft were calculated to increase through the study period by the same percentage as private party based aircraft at Palomar Airport. It was assumed that the needs for FBO aircraft for instruction, sales demonstrations, and rental would increase proportionately with based aircraft and airport activity. This rate of increase is approximately equal to the rate of increase forecasted for active airmen in the area.

The current number of based helicopters (31) was kept

Palomar Airport Road (San Diego County Route S-12) - This east-west county route is primarily a two-lane roadway connecting Interstate 5, approximately 2 miles south of Carlsbad, and State Route 78 near the community of San Marcos. Palomar Airport Road has been widened to four travel lanes between S-11 and the Palomar Airport Access Road in the site environs.

Traffic Controls

There are no traffic signalized intersections within the site environs. The Palomar Airport Road (S-12) and El Camino Real intersection, located approximately 2,500 feet east of the Palomar Airport Access Road, is a four-way stop. Vehicles exiting Palomar Field from Palomar Airport Access Road are controlled by a stop sign at the approach to Palomar Airport Road.

Traffic Volumes

The latest information regarding street traffic volumes for access roadways serving the Palomar Airport were obtained from the San Diego County Traffic Engineering Department. A summary of twenty-four hour and peak hour traffic volumes for the major access routes serving Palomar Field are presented in Table 1.

As indicated in Table 1, the heaviest traffic volumes recorded in the site environs occurs predictably on Interstate 5 near the Palomar Airport Road overcrossing. At that location I-5 is handling approximately 56,000 vehicles daily with an associated peak hour volume of 4,800 vehicles. El Camino Real, near the airport, is carrying approximately 6,150 vehicles daily with a peak hour volume of 610 vehicles. Traffic on a daily basis is equally balanced directionally, with 3,080 vehicles northbound and 3,070 vehicles

Table 1

EXISTING TWENTY-FOUR HOUR/PEAK HOUR TRAFFIC VOLUMES

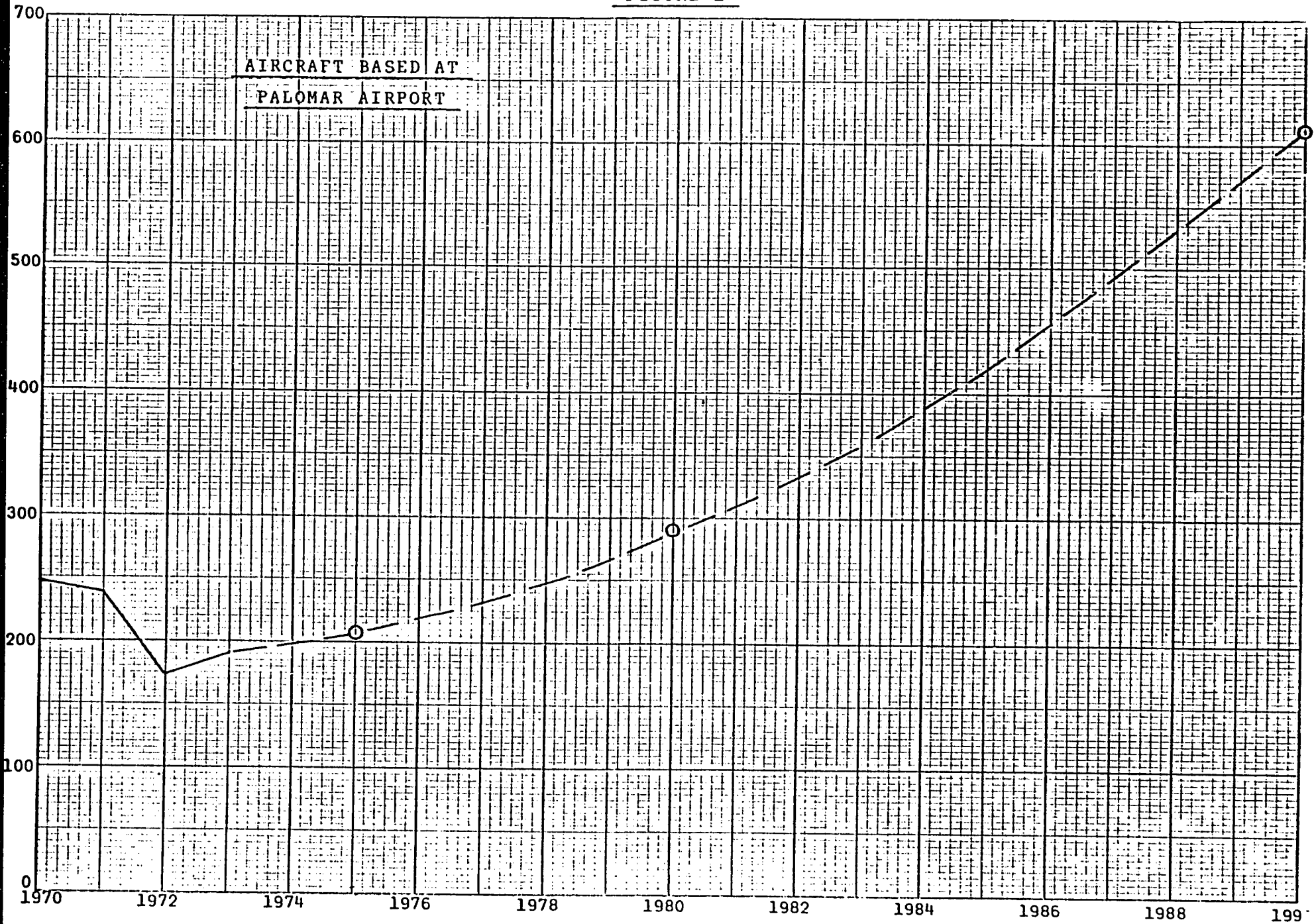
Palomar Airport Access Roadways

ROADWAY	LOCATION	NUMBER OF LANES	24-HR. VOLUME	PEAK HOUR VOLUME
Interstate Route 5	Palomar Airport Road	8	56,000	4,800
El Camino Real (S-11)	S/O Palomar Airport Road	4	6,150	610
Palomar Airport Road (S-12)	E/O Palomar Airport Access Road	4	3,600	400
	W/O Palomar Airport Access Road	2	3,460	375

southbound on an average day. Palomar Airport Road, west of El Camino Real, is handling 3,600 vehicles and 3,460 vehicles daily east and west of the Palomar Airport Access Road, respectively. Peak evening hour traffic volumes at these locations are 400 and 375 vehicles, respectively.

Since traffic volumes internally at Palomar Field were not available from County of San Diego agencies, Wilbur Smith and Associates conducted supplementary field traffic counts during April 1973 to complete the necessary traffic volume data base. Twenty-four hour traffic volume counts were conducted on the Palomar Airport Access Road slightly north of Palomar Airport Road between Wednesday, April 25, 1973 and Sunday, April 29, 1973. The results of that extensive hourly traffic count are shown in Table 2. As indicated, traffic volumes (total both directions) varied from a low of 632 vehicles daily on April 27, 1973 to a

FIGURE 1



The downward trend in operations per aircraft at Palomar is due to increasing congestion. As the demand and based aircraft increase tremendously in the late 1970's and 1980's, the airspace, airfield facilities, and control tower become overtaxed. Analysis of currently busy general aviation airports shows that this crowding discourages the proportional rapid acceleration of instruction and recreation flying. Since these are high operations per aircraft activities, the average annual operations per aircraft decreases. Figure 2 shows the total annual operations at Palomar forecasted through 1990.

The FAA publishes airport operation activity for most major United States airports in the Terminal Area Forecast 1974-1984. In the October 1972 edition, the FAA forecasts only a slight growth in airport activity at Palomar through 1984. The FAA has since revised their estimate upward such that there is much better agreement with the forecast shown here.[1/] The FAA forecast differs from the forecasts shown here in that they assume that the basic airport facilities will remain unchanged. Since Palomar is currently operating near its design capacity, only a slight increase in aircraft operations can occur without increased facilities. The forecasts developed in this study are based on an assumption of unconstrained demand.

III. AIRCRAFT MIX

Table 3 shows the current and forecasted aircraft mix of operations at Palomar Airport. The current mix shown is not based on actual counts but on observations made at the airport and from discussions with FAA tower personnel.

1/ Letter dated October 31, 1973 from: FAA Regional Planning Officer to: Chief, Aviation Forecast Division, AEC-200; Subject: Aviation Forecast for Palomar Airport at Carlsbad, California

FIGURE 2

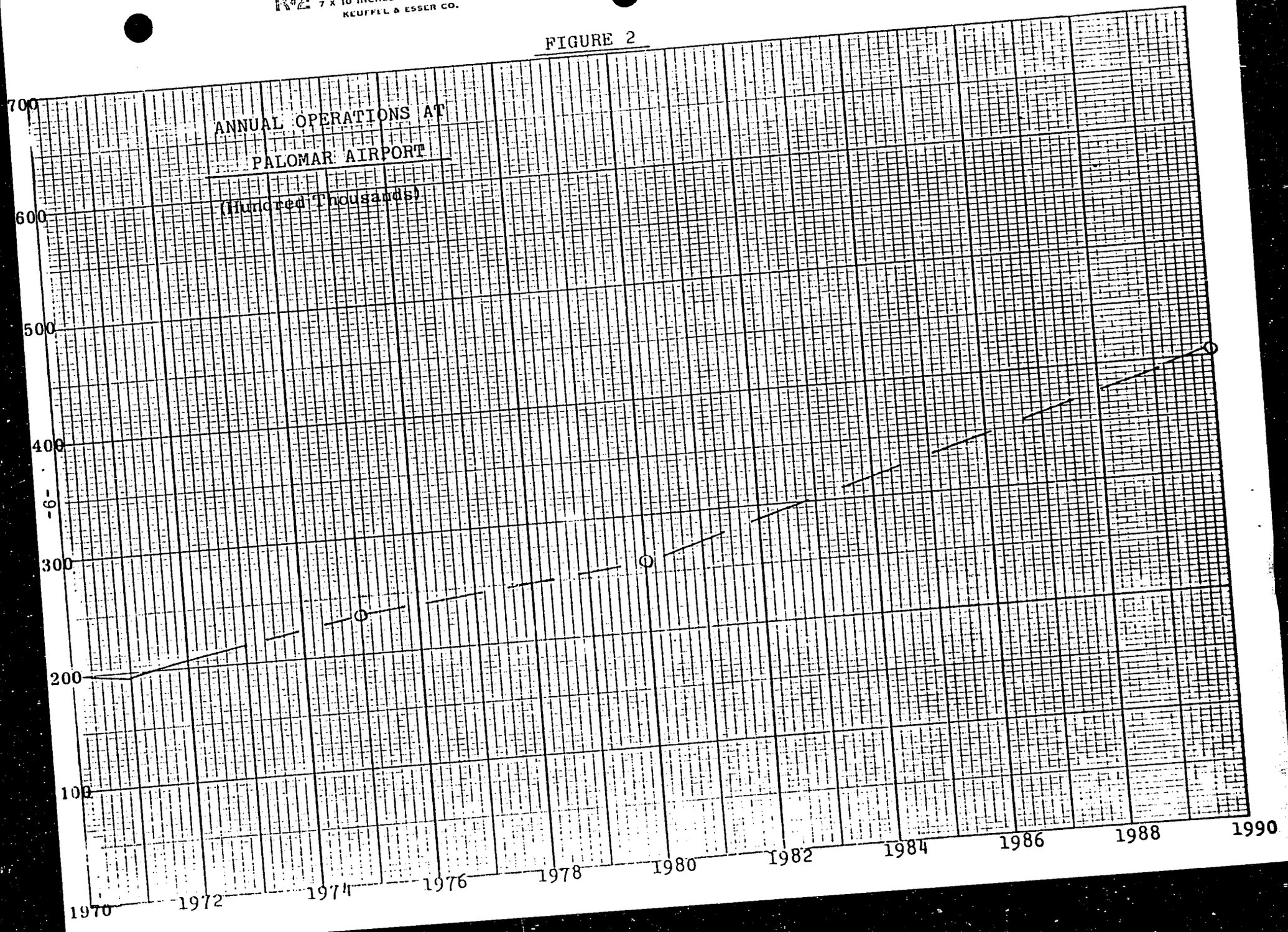


Table 3

AIRCRAFT OPERATIONS MIX

	1973	1975	1980	1990
Single Engine (%)	80	80	79	75
Twin Engine (%)	19	19	19	22
Business Jet (%)	1	1	2	3

The current number of business jet operations is substantially less than one percent. However, the installation of an ILS system and the planned expansion in jet related FBO services will encourage the rapid growth of business jet activity at Palomar.

The forecasts of based aircraft and operations for 1980 and 1990 indicate a tremendous growth of general aviation activity at Palomar in the near future. The forecasts are based on an assumption of semi-unrestricted demand.

The operations projection assumes that the facilities required will be available to meet the demand. However, as discussed above in the operations section, as an airport becomes tremendously active, it reaches a point of saturation. At that point a single airport cannot reasonably meet all of the demands placed upon it. If current levels of operations per aircraft continued until 1990, the annual operations would approach 700,000. However, our decrease in operations per aircraft resulted in a lower operations forecast in 1990 for Palomar Airport.

It would be reasonable to expect that this high volume

of forecasted general aviation activity will not all be seen at Palomar Airport. Because the growth in demand is so large, part of the activity will likely be diverted to other enlarged or new facilities in the North County region.

IV. COMPARISON WITH OTHER FORECASTS

Table 4 compares the forecast of operations made my Mitchell Research Associates with those of the FAA and the San Diego Plan For Air Transportation (SANPAT) Study.

Table 4

COMPARISON OF OPERATIONS FORECASTS

	1973	1975	FY75	FY77	1980	FY85	1990
MRA (000)	210	232			259		402
FAA[1] (000)			228	258		300	
SANPAT[2] (000)							
Design		254			397		762
Alternate		193			267		511

The FAA operation forecasts are lower than the other forecasts; they increase only slightly through their forecast period of 1984. This is due to the fact that the FAA does not attempt to forecast airport facility expansion, but instead bases its operations forecast on the maintenance of current facilities. Since the current facilities at Palomar Airport are almost saturated, a very small operations increase could be expected based on the FAA forecasting procedure.

[1] Letter dated October 31, 1973 from: FAA Regional Planning Officer, to: Chief, Aviation Forecast Division, AEC-200, Subject: Aviation Forecast for Palomar Airport at Carlsbad, California.

[2] SANPAT, Interim Technical Report 4, Volume II, April 1973.

Two forecasts are shown from the SANPAT study. Actually these are just two of many forecasts based on varying assumptions detailed in the SANPAT Interim Report 4. The "design" forecasts are based on the original countywide general aviation demand forecast, and the "alternate" forecasts are based on calculations of an estimated lower limit of general aviation demand for the San Diego Region. The SANPAT alternate forecast compares favorably with the State of California Department of Aeronautics forecast of general aviation demand for the San Diego Region.

The SANPAT forecasts shown in Table 4 represent the general aviation demand allocation based on expansion of the current general aviation airport system. These forecasts were developed by first establishing airport service areas, and then assessing the relative number of airport users with home origin-destination locations within the service area. The MRA numbers are in close agreement with alternate SANPAT forecast. For 1990 the MRA forecast is lower than the alternate, and substantially lower than the design. However due to the difficulties of forecasting so far into the future, the MRA and SANPAT forecasts appear generally quite compatible.

APPENDIX D

ENVIRONMENTAL IMPACT STATEMENT

COUNTY OF SAN DIEGO

INTER-DEPARTMENTAL CORRESPONDENCE

DATE December 4, 1975

REVISED: May 3, 1976

TO: Board of Supervisors

FROM: Environmental Review Board

SUBJECT: Environmental Impact Report for PALOMAR AIRPORT MASTER PLAN [Log #75-7-13] 667 acres located immediately northwest of the intersection of Palomar Airport Road and El Camino Real, approximately 3 miles west of the City of San Marcos (Supv. Dist. V)

The Environmental Review Board has reviewed the attached Environmental Impact Report (EIR). Based on the discussion of issues which follows, the Environmental Review Board recommends that:

1. The Board certify that the EIR has been completed and is considered to be in compliance with the provisions of the California Environmental Quality Act (CEQA).

2. The Board determine that the proposed project will have significant environmental impact in terms of noise, air quality, and growth inducement.

3. If the project is approved, the enclosed mitigating measures should be made conditions of approval.

ERB DELIBERATIONS

On motion of Mr. Buckner, seconded by Mr. Manganelli, the Environmental Review Board approved the EIR with additions regarding the loss of a food-producing source (proposed by Mr. Buckner); noise impacts and mitigating measures (proposed by Mr. Hurlburt); and vernal pools if deemed appropriate after further investigation (proposed by Mr. Evans).

AYES: 7
NOES: 0

On motion of Mr. Manganelli, seconded by Mr. Buckner, the Environmental Review Board recommends to the Board of Supervisors that the project be found significant in terms of air quality, noise, and growth-inducement.

AYES: 7
NOES: 0

Respectfully submitted,

DAVID C. NIELSEN, Secretary
Environmental Review Board

DCN:REG:leb

Enclosures:
A. Environmental Impact Report, pages 2-9
B. Initial Growth Policy Compatibility Matrix, 1 page
C. Maximum CNEL contours of 5 and 65 decibels (A-weighted).
D. Draft Environmental Impact Report prepared by Ray Glass for William L. Pereira & Associates, January, 1975, 60 pages
E. Technical Appendices to Palomar Airport Master Plan
Appendix:
1. Access Plan
2. Biology Survey
3. Archaeological Survey
4. Noise CNR/CNEL Conversion
5. Energy Conservation Report
F. Letters of Public Comment, 6 pages
G. References, 1 page

cc: Chuck Stuck, Division of Airports

December 4, 1975
Revised: May 3, 1976
ENCLOSURE A

ENVIRONMENTAL IMPACT REPORT

PROJECT: PALOMAR AIRPORT MASTER PLAN, [Log #75-7-13]

BACKGROUND

A final EIR on the Palomar Airport Master Plan was presented to the Environmental Review Board on July 10, 1975. After presentation and brief discussion, the hearing was continued indefinitely at the request of Division of Airports Staff to permit preparation of supplemental information.

PROJECT DESCRIPTION

Palomar Airport is an existing facility in northwestern San Diego County, approximately 4 miles southeast of the City of Carlsbad. The Palomar Airport Master Plan proposes phased expansion of facilities through 1990. These phases are as follows:

Phase I, near term, 1975-76

a. Acquire land and avigation easement.

b. Design south Fixed Base Operator (FBO) area, and design grading and drainage for north runway.

c. Construct south FBO area.

d. Install Instrument Landing System (ILS) on Runway 24L and install south FBO utilities.

Phase II, intermediate term, 1977-80

a. Design grading and drainage for north FBO area.

b. Construct runways, taxiways, perimeter roads, and fire station.

c. Install various navigational aids, lights, and perimeter fencing.

Phase III, long term, 1980-90

a. Design taxiways, roads, grading, and drainage.

b. Construct taxiways and roads.

c. Install lights and utilities.

It is proposed by Division of Airports Staff that this expansion program will make Palomar Airport economically self-sufficient. Land uses proposed conform to the San Diego County Zoning Ordinance and General Plan Land Use Element, and to the City of Carlsbad General Plan Land Use Element.

MAJOR ISSUES

1. Air Quality

When the proposed master plan development is completed (1990), Palomar Airport will generate approximately 5,890 surface vehicle trips per day and approximately 1100 aircraft operations per day. These transportation sources and industrial fixed sources which locate nearby will cause measurable increases in air pollutant emissions, specifically hydrocarbons, oxides of nitrogen, and carbon monoxide. However, these emissions will be less than 1% of the total emissions in the San Diego Air Basin, based on current trends.

2. Noise

The Airport Influence Area is defined by California's Title 4 as the area within 65 CNEL. The noise zone is not to enclose houses and is to be incrementally achieved by 1985.

Utilizing the state noise criterion of 65 CNEL and the relative probability of accidents of light aircraft, the 1990 Airport Influence Area was cooperatively developed with the Airport Land Use Commission and the Palomar Ad Hoc Committee. The 1990 Airport Influence Area was superimposed over the City of Carlsbad's General Plan and a compatible land use plan was developed which meets the State Noise Standard.

The plan was based on a Practical Annual Capacity (PANCAP) of 435,000 operations for 1990 and a forecasted operational mix consisting primarily of single and twin engine aircraft with 3% business jets (half conforming to noise standards specified in Federal Aviation Regulations (FAR) Part 36 and the other half nonconforming) and the development of a parallel runway 700 feet to the north of the existing runway.

Contingent upon changes in technology, such as retrofitting and quieter engines, the Airport Land Use Commission may review the operational level and permit an increase above 435,000 operations if no further environmental degradation occurs.

3. Water and Sewer Services

These services are presently provided by the City of Carlsbad, which has adequate service capacity to meet the needs of the existing facility. The proposed expansion will require additional water for greenbelt irrigation and fire protection and will require additional water and sewer service for fixed base operators on the airport and nearby industrial uses.

Quantitative projections of these service requirements do not exist, nor do plans exist for the provision of these service requirements. The City of Carlsbad has indicated that no expansion related services will be provided to Palomar Airport until the airport properties are annexed to that city. However, the San Diego County Board of Supervisors has ordered that an airport master plan be complete and approved prior to such airport being annexed to any entity.

4. Growth

Expansion of the Palomar Airport as proposed in the Master Plan will have a regional growth-inducing impact. Future development may be encouraged by the availability of utilities and services in addition to the convenience of an expanded airport for business-related aircraft operations. Expansion of industry will increase the North County population, thereby increasing the demand for urban facilities and services.

In the immediate vicinity of Palomar Airport, growth and industrialization will cause the loss of food-producing natural resources (high intensity agricultural crops). Also, expansion of the airport and nearby industrialization will destroy approximately 20 acres of scarce biological habitat (vernal pools) on the project site and numerous vernal pools in the immediate vicinity of the airport.

PROJECT ALTERNATIVES

1. No Project

Under this alternative, aircraft operations would continue to increase, but more slowly than the present proposal would allow. Ultimate noise and air quality impacts would be correspondingly less, but economic self-sufficiency of the airport would not be achieved.

2. Design Alternatives

Seven alternative designs were considered and discussed in the Palomar Airport Master Plan. The alternative being proposed was selected at the direction of Airport Division Staff. "This location represents a compromise solution which does not fully answer the areas' future needs. However, it does supply additional capacity to the existing facility which is of some help to the future requirements." (Reference 4.)

3. Greater Expansion

Greater expansion such as longer runways able to accommodate heavier aircraft would worsen those air quality, noise, and growth-inducing impacts already identified. Under this alternative, the ability of the airport to sustain itself economically would require re-examination, since it would then be competing with Lindbergh Field or the proposed regional airport.

RESPONSE TO PUBLIC COMMENTS

Two letters of public comment were received during a public review period from June 7 to July 7, 1975. One letter of public comment was received during a second public review period from November 7 to November 26, 1975.

1. Carlsbad Municipal Water District commented that the draft EIR didn't discuss the water supply problem adequately and that an engineering master plan study should be conducted for airport water use. This is discussed under Major Issue #3.

2. The California Native Plant Society commented that no listing was made in the draft EIR of flora in the subject area, that the San Diego County Natural Resource Inventory is a questionable reference, and that several rare and/or endangered plant species are known to be in the subject area, yet were not addressed in the EIR. The letter concluded that a more complete botanical survey of the site must be performed.

   A report of such a survey, including a listing of flora on the site is included in the technical appendices to the draft EIR, which are available for public review at the offices of San Diego County Environmental Analysis Division, 9150 Chesapeake Road. The rare and/or endangered plants in the vicinity of the subject project "... include Cercocarpus minutiflorus Abrams, Arctostaphylos glandulosa var. crassifolia Jeps., Adolphia californica Wats., and Ceanothus verrucosus Nutt," (Ref. CNPS letter dated 16 June, 1975). None of these species was identified on the subject property; therefore, no direct impacts will occur; however, increased industrialization and population growth induced by Palomar Airport expansion will undoubtedly impact these species.

3. Max Len, an owner of adjacent property, favors airport expansion, but contends that the acquisition program must include acquisition of FAA - required clear zones and comments that the draft EIR failed to consider the activities and operations of sublessee, and considered only the operation of the airport proper.

   The complete airport system and its indirect impacts such as industrial, growth inducements, increased traffic flows, and related impacts of air pollutant emissions and noise were adequately discussed on page 38 ff of the draft EIR and in Master Plan appendices on "Access" and "Financial and Economic Data."

MITIGATING MEASURES

1. Water and Sewer Services

Prior to the approval of expansion of Palomar Airport, a study of water and sewer service requirements, including quantitative projections of needs should be completed by San Diego County Division of Airports. This study should be included as an appendix to the Master Plan and should be reviewed by Department of Sanitation and Flood Control, Environmental Analysis Division, and City of Carlsbad prior to acceptance.

2. Archaeology

The two identified nearby archaeological sites should be physically located by a County archaeologist and fenced off prior to any construction operations connected with the Airport Master Plan development.

3. Noise

a. Community Noise Equivalent Level (CNEL) contours of 65 decibels (A-weighted) due to any combination of air traffic operations, surface vehicles utilizing the airport facilities, and on-site fixed noise sources will not be permitted to exceed the 65 decibel (A-weighted) contour defined on the CNEL contour map (Enclosure C).

b. If the above-mentioned defined impact areas should be exceeded due to any combination of air traffic operations, surface vehicles utilizing airport facilities, and on-site fixed noise sources, then airport operations must be restricted to achieve conformance with the contours.

Recommended Measures Which Cannot Be Mandated

Noise

1. Airport operations beyond 435,000 should not be permitted without approval of the Airport Land Use Commission.

2. Approval of all development within the impact area defined by the CNEL Contour Map should be contingent upon conformity to the Comprehensive Land Use Plan - Palomar Airport published by the Comprehensive Planning Organization (CPO), specifically figure III-2, "Land Use Suitability in Noise Impact Areas," page 20. Such approval should involve the CPO.

3. The City of Carlsbad should amend its land use plan to assure compatibility with airport development.

PALOMAR AIRPORT MASTER PLAN
Log #75-7-13

ENCLOSURE B

INITIAL GROWTH POLICY COMPATIBILITY MATRIX

Growth-affecting Characteristic	Encourage Urban Development	*Discourage Urban Development	Avoid Urban Development
1. Public Service		Water 3 Sewer 3	
2. Schools & Community Facilities	Provides air transportation facilities		
3. Transportation Access	Provided		
4. Socio-economic Composition	Social make-up unchanged Industrialization		
5. Natural Hazards	None		
6. Natural Resources		Archaeology ( ) Biology ( )	
7. Intensity of Development		Growth-inducing 4	
8. Planned Use	Conforms		
9. Resource Impact		Noise 2 Air Quality 1	

SYMBOLS

The number(s) following each growth-affected characteristic in one of three categories indicate(s) the Major Issue(s) which discuss(es) that finding.

A number enclosed in parentheses () indicates the project may be acceptable if these characteristics are mitigated in a manner that will not encourage any further growth.

*This category refers to a current condition relative to present growth and does not indicate unacceptability for future development.

REFERENCES

1. Noise Impact Assessment for San Diego County Airports; prepared by Daniel, Mann, Johnson, and Mendenhall; April 1972.

2. Airport Noise Study for San Diego County; prepared by Daniel, Mann, Johnson, and Mendenhall; November 1972.

3. Comprehensive Land Use Plan - Palomar Airport; prepared by Comprehensive Planning Organization; May 1974.

4. Master Plan Report - Palomar Airport; prepared by William L. Pereira Associates; January 1975.

5. Environmental Impact Statement - Palomar Airport; prepared by Ray Glass; January 1975.

6. City of Carlsbad General Plan Elements

   Noise
   Land Use
   Circulation

San Diego County: Division of Airports
Department of Agriculture

ENVIRONMENTAL IMPACT STATEMENT

PALOMAR AIRPORT

Prepared by

Ray Glass

For

William L. Pereira & Associates

January 1975

CONTENTS, Contd

CORRECTION

To assure optimum legibility the preceding document and/or group of documents have been re-photographed and their images appear immediately hereafter. .

COUNTY OF SAN DIEGO

Department of General Services

Central Records Service

County Operations Center, 5555 Overland Avenue, San Diego, California 92123

CRS 350 (11 74)

ENVIRONMENTAL IMPACT STATEMENT

PALOMAR AIRPORT

Prepared by

Ray Glass

For

William L. Pereira & Associates

January 1975

CONTENTS

CONTENTS, Contd

Section 1
DESCRIPTION OF PROJECT

1.1 BACKGROUND

The existing airport system in the San Diego Region is composed of commercial air carrier, general aviation (business and recreational), and military aviation facilities. The major air carrier facility is the San Diego International Airport (Lindbergh Field). The four principal general aviation facilities are Gillespie Field, Palomar Airport, and Montgomery and Brown Fields. The military installations include Miramar, North Island, and Imperial Beach Naval Air Stations and Pendleton Naval Auxiliary Landing Station. An additional air carrier facility, the Tijuana International Airport, may also be considered as a component of the regional system by reason of its proximity to the border and potential air space conflict.

See Figure 1 for the regional concept. The military was an influential force in determining the form of the present system of airports. See Reference 1 for further historical background. Requirements of World War II led to the construction and operation of several military airport facilities as well as improvements to Lindbergh Field. Gillespie Field, Miramar Naval Air Station (Camp Kearny), Brown Field, and military airstrips at Ramona and Jacumba were developed.

Palomar Airport is a postwar development of civilian origin. In 1959 Palomar Airport, near Carlsbad, was constructed to provide service to the North County and serve as a replacement for the Del Mar Airport which was sold to the State in 1959 as right-of-way required for construction of Interstate 5.

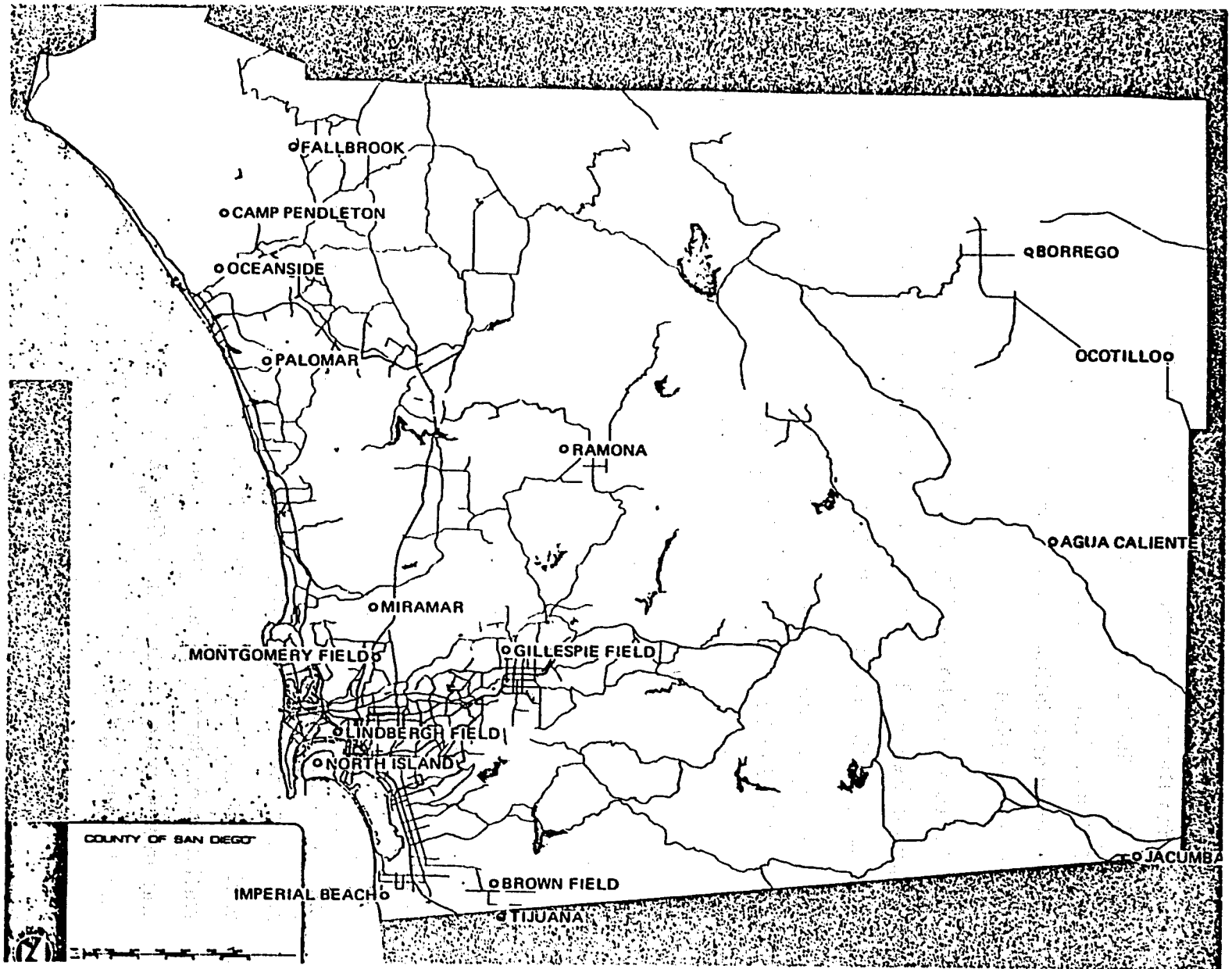


Figure 1. San Diego Regional Airfield System

1.2 SITE INFORMATION

Palomar Airport is located approximately thirty miles north of the City of San Diego, California, and about four miles south of Carlsbad, California. The Pacific Ocean is about five miles to the west, with the City of Vista, California, located five miles to the east. Palomar Airport is positioned at a latitude of 33°7'N and 117°16'W, at an elevation of 328 feet above sea level.

The airport is bounded by Palomar Airport Road (S12) to the south, El Camino Real (S11) to the east, and vegetation of the coastal sage scrub community to the north and west (Figure 2).

The airport site shown on Figure 3 and all area inside the dashed line is owned by San Diego County. The airport presently consists of 255 acres with one runway, 6/24, at a length of 4700 feet and a width of 150 feet. The runway is asphalt with a single-wheel capacity of 50,000 pounds. The ultimate development of the land area is intended to serve the general aviation needs of the North County area of San Diego County.

The northern portion of San Diego County is experiencing a continuing steady rate of growth which is supported in part by the economic development of the San Diego economy, along with the current growth trend which is marked by increased population densities.

Navigation aids provided at Palomar include medium intensity lighting system and a Unicom radio operating on a 24-hour basis. Approach lights are planned for installation on Runway 24 late this year (1974) and an ILS system will be installed on Runway 24 early in 1975

The number of annual operations which have occurred at Palomar over the past eight-year period are illustrated in Table I.

Table I. Aircraft Operations at Palomar Airport

Year	Operations
1965	48,000
1966	57,000
1967	154,000
1968	168,000
1969	189,000
1970	200,000
1971	197,000
1972	197,000
1973	203,000

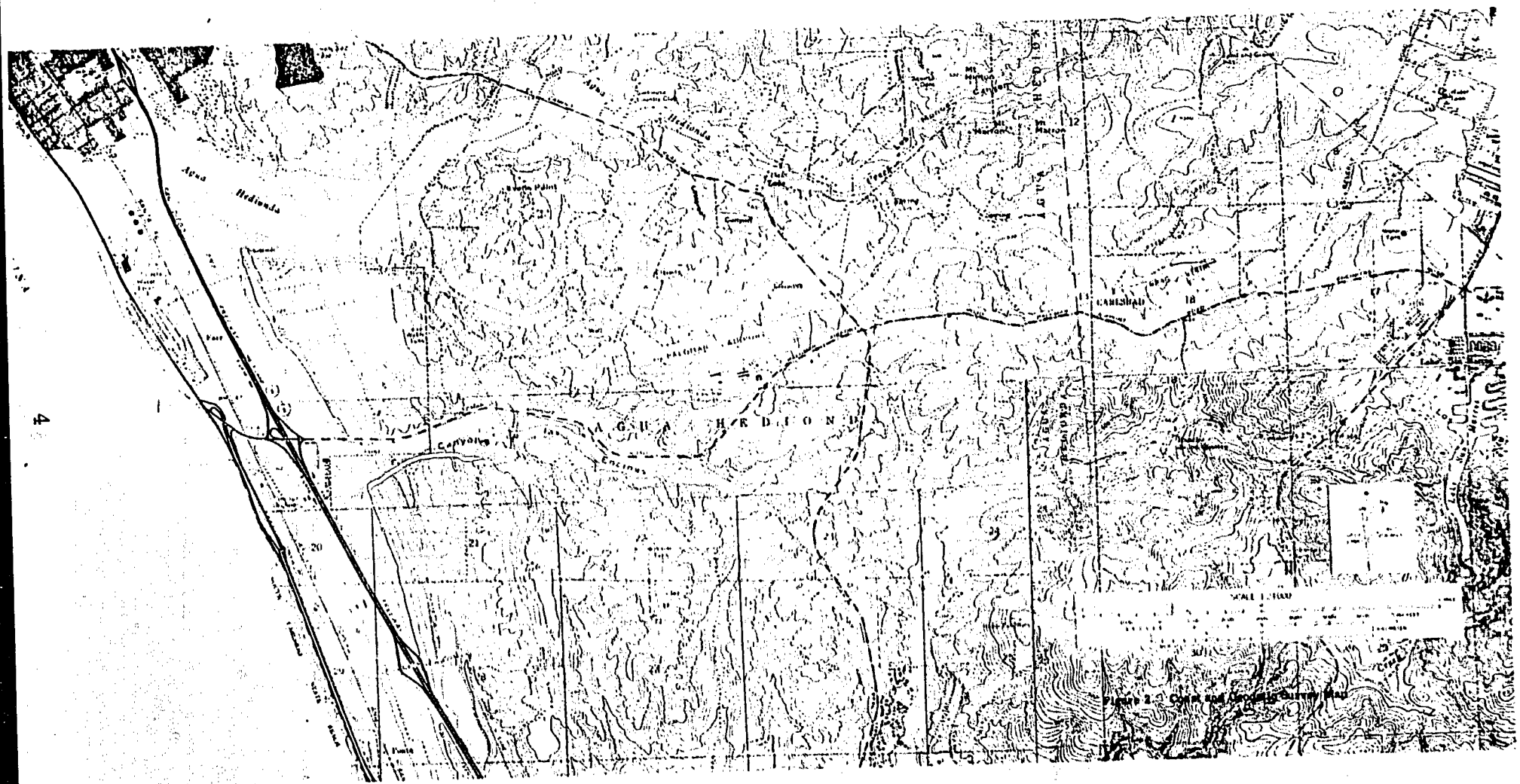


FIGURE 2. Cadastral Survey Map

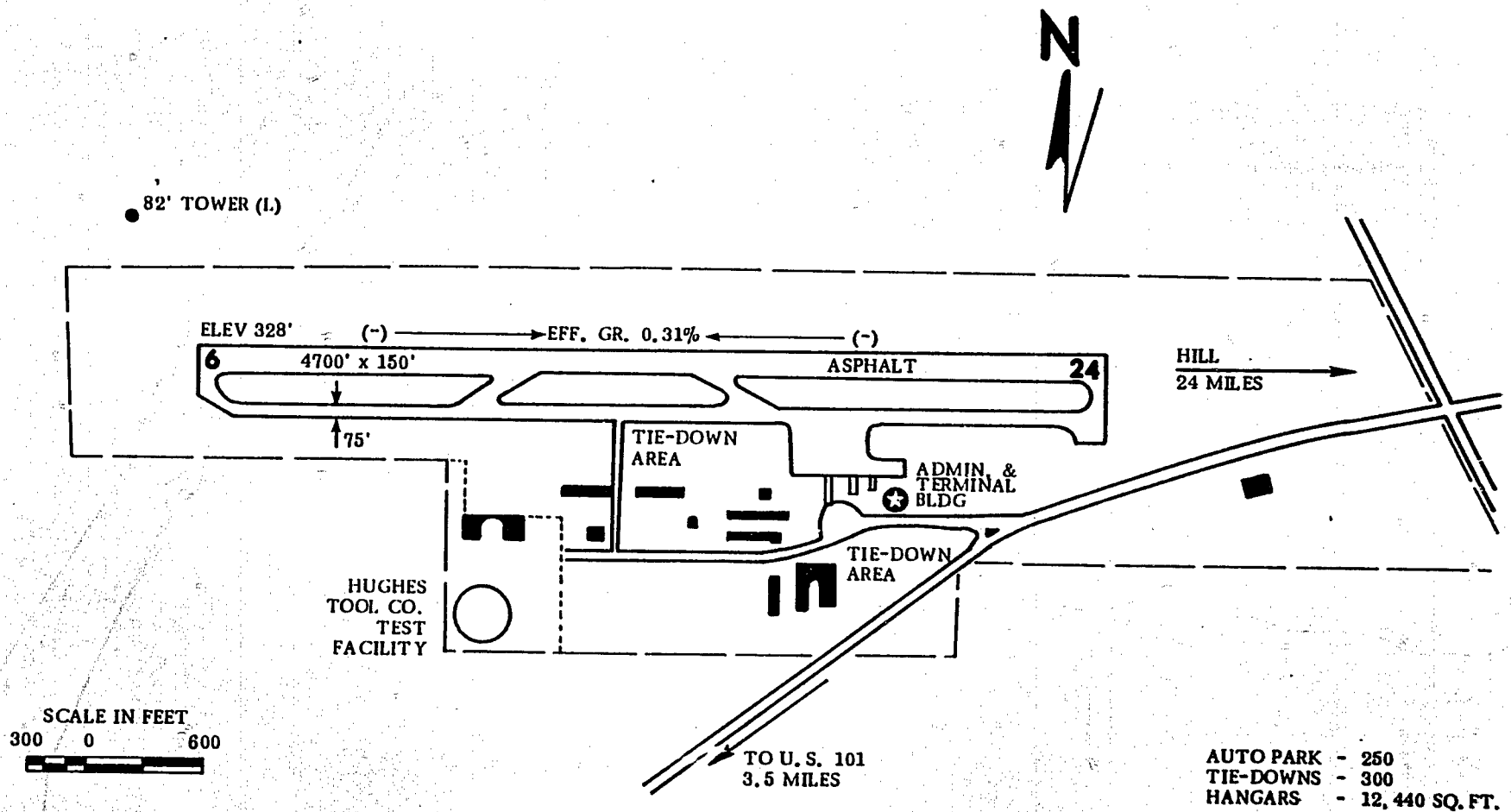


Figure 3. Airport Layout – Palomar Airport, Carlsbad, California

1.2.1 Support Facilities and Fixed Base Operators

Palomar Airport presently sustains a number of small aircraft related businesses consisting of flight instruction, aircraft charter, aircraft sales and rental, engine repair, maintenance, fuel, storage, as well as a restaurant. In addition, there are airport management and maintenance as well as federal agency personnel involved in airport operations housed on airport property. The only industry is the Hughes Tool Company assembly and test facility.

The aviation-oriented activities, operation areas, related government agencies, and Hughes Tool Company presently employ approximately 200 people total and occupy approximately 8 percent of the land located on the airport property. In the past the Hughes Tool Company employed nearly 200 persons and are presently increasing their minimal staff due to the addition of a helicopter ground run-up test facility recently completed.

1.2.2 Ground Access

Palomar Airport is served by two arterial roadways, plus a limited number of collector streets as illustrated in Figure 3. The entrance to the airport was recently (1974) enlarged by the addition of stop lights and turn lanes, as well as an access road to business on the south and west portion of the airport property.

1.3 TOPOGRAPHY, CLIMATOLOGY, AND METEOROLOGY

Palomar Airport is located on a narrow coastal plain less than a mile wide. The airport is located in rolling terrain which slowly rises to meet the mountains 8 miles to the east. The uneven terrain is further cut up by eroded canyons and waterways.

Temperatures are moderate in the Palomar Airport area. The annual total of heating degree day units is about 1760. The mean daily maximum in July and August is only 82°, although high readings of over 100° have been reported at times in both September and October. Minimum readings

during the summer average near 60°. During the winter months the minimum averages 42° while afternoon readings will range in the upper 60s. The absolute low recorded in 13 years of record has been 27°. In a typical year 10 days can be expected to produce maximum readings of 90° and above, and eight days can be anticipated with minimums of 32° or lower. In five years out of ten the last 32° reading in the spring can be expected no later than February 1. The first 32° reading in the fall can be expected earlier than December 9 in 50 percent of the years. Between these two dates there is a typical growing season of 311 days. However, in 20 percent of the years there is no reading of 32° or lower during the spring months, and in 10 percent of the years, there will be no 32° reading in the fall.

Precipitation is light in the Palomar Airport area. The mean of fourteen years of available records shows 16.28 inches per year. However, there is a wide variation in the amount of moisture received from year to year. In about one year out of twenty a yearly total precipitation of only 9 inches can be expected, while a wet year producing more than 27.50 inches of rain can be expected with the same frequency.

One year in four should produce rainfall of less than 13 inches, while a total in excess of 20.60 inches can be expected one year out of four. Occasionally, rainfall may be heavy for brief periods. An intensity of 0.70 inch per hour can be expected as often as every other year, while 1.50 inches per hour might fall once in 100 years. Six-hour totals of 1.40 inches and 3.40 inches are indicated for return periods of two years and 100 years, respectively. Twenty-four hour totals of 2.00 inches and 5.00 inches are suggested with the same frequencies. Normally, there are about 28 days per year with 0.10 inch or more of precipitation. No snow has been reported during the period of record at Palomar Airport, although it is likely that snow can be observed for brief periods on some occasions.

Typically, Palomar Airport receives about 233 clear days per year, 62 days of partly cloudy weather, and 70 days that can be classified as cloudy. The wind is often from a west or southwest direction, although

winds from other directions may occur at times under the influence of certain weather conditions (Figure 4). Wind speeds reaching 30 to 35 mph might be expected as often as every other year, the speed increasing to 60 mph once in 50 years. Winter storms are responsible for most of the strong winds, although local thunderstorms or down-slope winds from the north and east may occasionally result in some wind damage. Relative humidity during the winter months usually ranges from about 55 to 75 percent, while summer readings might average about 5 percent higher.

A climatological summary of means and extremes in local weather in Table II was extracted from Reference 2. The foregoing narrative is also from Reference 2.

Table II. Climatological Summary - Vista, California

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
IN COOPERATION WITH VISTA CHAMBER OF COMMERCE
CLIMATOGRAPHY OF THE UNITED STATES NO. 20 -

CLIMATOLOGICAL SUMMARY

STATION Vista, California

LATITUDE 33° 12' N.
LONGITUDE 117° 13' W.
ELEV. (GROUND) 120' to 600'

MEANS AND EXTREMES FOR PERIOD 1933-1960

Month	Temperature (°F) Means: Daily maximum	Daily minimum	Monthly	Extremes: Record highest	Year	Record lowest	Year	** Mean degree days	Precipitation Totals (inches): Mean	Greatest daily	Year	Snow, Sleet: Mean	Maximum monthly	Year	Greatest daily	Year	Mean number of days: Precip. .10 inch or more	Temperatures Max. 90° and above	Max. 32° and below	Min. 32° and below	Min. 0° and below	Month
(a)	13	13	13	13		13		13	13	13		13	13		13		13	13	13	13	13	
Jan	67.0	41.9	54.5	84	1958+	27	1943	330	2.45	3.25	1943	0	0		0		5	0	0	3	0	Jan
Feb	66.0	42.3	54.2	89	1943	27	1942	300	3.83	4.01	1940	0	0		0		6	0	0	2	0	Feb
Mar	68.8	44.6	56.7	92	1934	29	1939	260	2.33	2.00	1941	0	0		0		5	*	0	1	0	Mar
Apr	71.2	48.8	60.0	90	1960+	32	1945	170	1.57	1.64	1958	0	0		0		3	*	0	*	0	Apr
May	74.4	52.1	63.3	95	1942	38	1942	110	0.13	0.50	1933	0	0		0		*	1	0	0	0	May
Jun	76.7	55.6	66.2	88	1943	41	1943	40	0.15	0.51	1944	0	0		0		*	0	0	0	0	Jun
Jul	81.8	59.4	70.6	99	1940	49	1941	0	0.01	0.07	1941	0	0		0		0	2	0	0	0	Jul
Aug	82.0	60.5	71.3	99	1945+	49	1941	0	0.19	1.55	1945	0	0		0		*	2	0	0	0	Aug
Sep	81.0	57.4	69.2	107	1959	39	1941	30	0.32	2.38	1939	0	0		0		1	3	0	0	0	Sep
Oct	76.8	53.0	65.0	101	1958	40	1943+	50	0.86	1.80	1934	0	0		0		2	2	0	0	0	Oct
Nov	73.1	45.8	59.6	96	1933	30	1958+	190	1.14	2.54	1944	0	0		0		2	*	0	1	0	Nov
Dec	69.2	42.7	56.0	89	1959+	28	1960	280	3.30	2.50	1940+	0	0		0		4	0	0	1	0	Dec
Year	74.0	50.3	62.2	107	Sept 1959	27	Jan 1943+	1760	16.28	4.01	Feb 1940	0	0		0		28	10	0	8		Year

(a) Average length of record, years.

T Trace, an amount too small to measure.

** Base 65°F(Data estimated)

+ Also on earlier dates, months, or years.

* Less than one half.

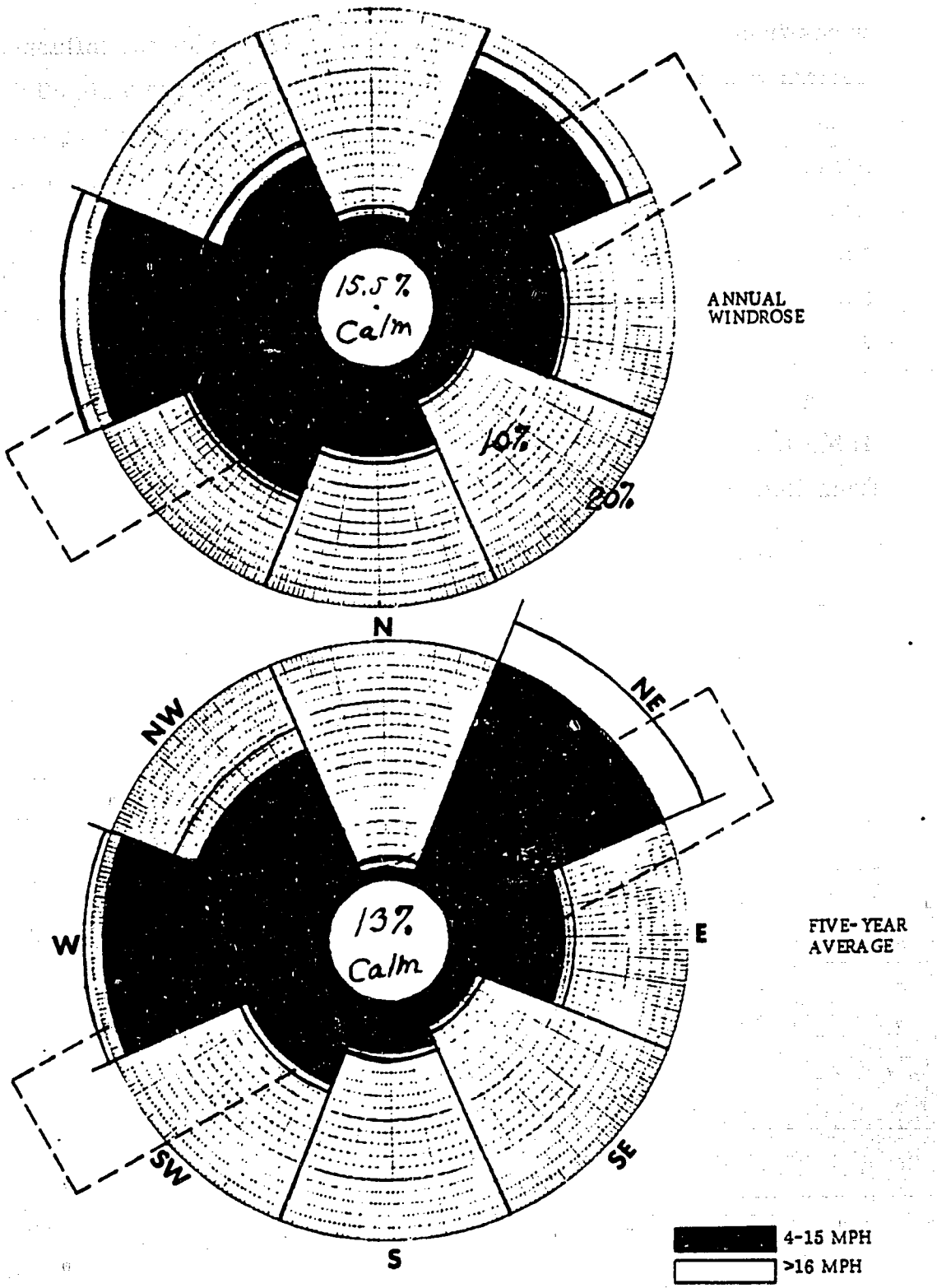


Figure 4. Wind Distribution

The excellent local weather conditions affords the opportunity of good flying conditions year round. Thus, Palomar Airport operations can be expected to remain relatively constant throughout the year. Some increase in operations is experienced during the summer months due to longer daylight hours, however.

1.4 PROPOSED DEVELOPMENT

The proposed development at Palomar Airport will evolve into the ultimate land use plan shown in Figure 5. This development will be undertaken in three basic phases defined as:

a. Near term (1974-1976).
b. Intermediate term (1976-1980).
c. Long term (1980-1990).

The three phases allow for incremental expansion of the airport facilities to meet the growing airport need (Reference 3).

The near term development is depicted in Figure 6. The near term development requires the following actions:

a. Acquire land north of the existing airport for the construction of Runway 6L/24R and necessary future aviation facilities and activities.

b. Acquire land southeast of the intersection of El Camino Real and Palomar Airport Road for a clear zone.

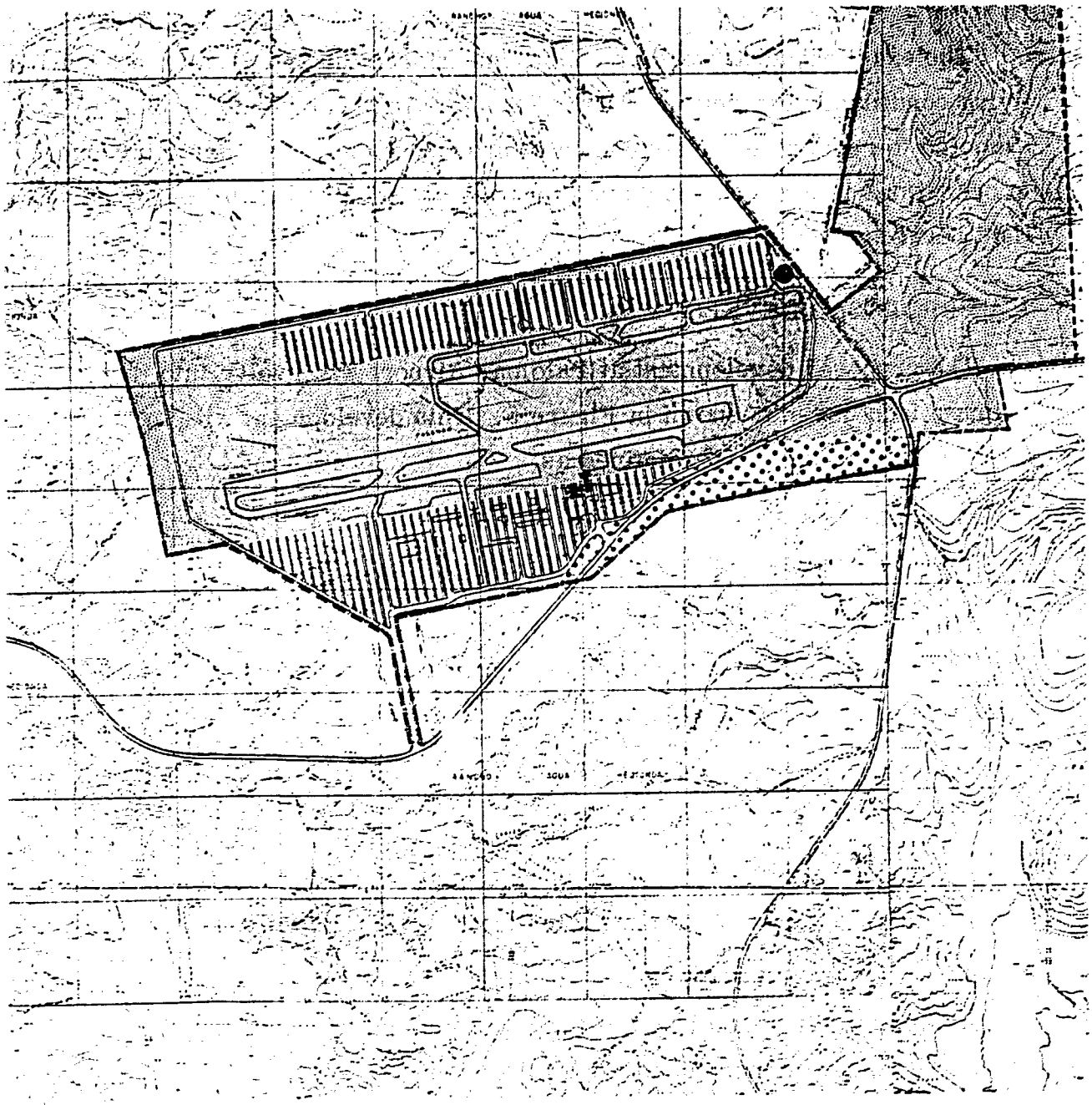
c. Acquire an avigation easement on the hill obstructing the approach to Runway 24L (this is approximately one mile east of the runway).

d. Design grading and drainage for the north runway system (6L/24R).

e. Complete the installation of the ILS on Runway 24L.

f. Design and construct the south Fixed Based Operator (FBO) area road system including the intersection with the Palomar Airport Road.

g. Install utilities in the south FBO area.



N

0 500 1000 2000 5000 FEET

SOURCE: WLPA

RUNWAY, TAXIWAY SYSTEM

AVIATION ORIENTED

INDUSTRIAL/COMMERCIAL

RECREATION/BUFFER

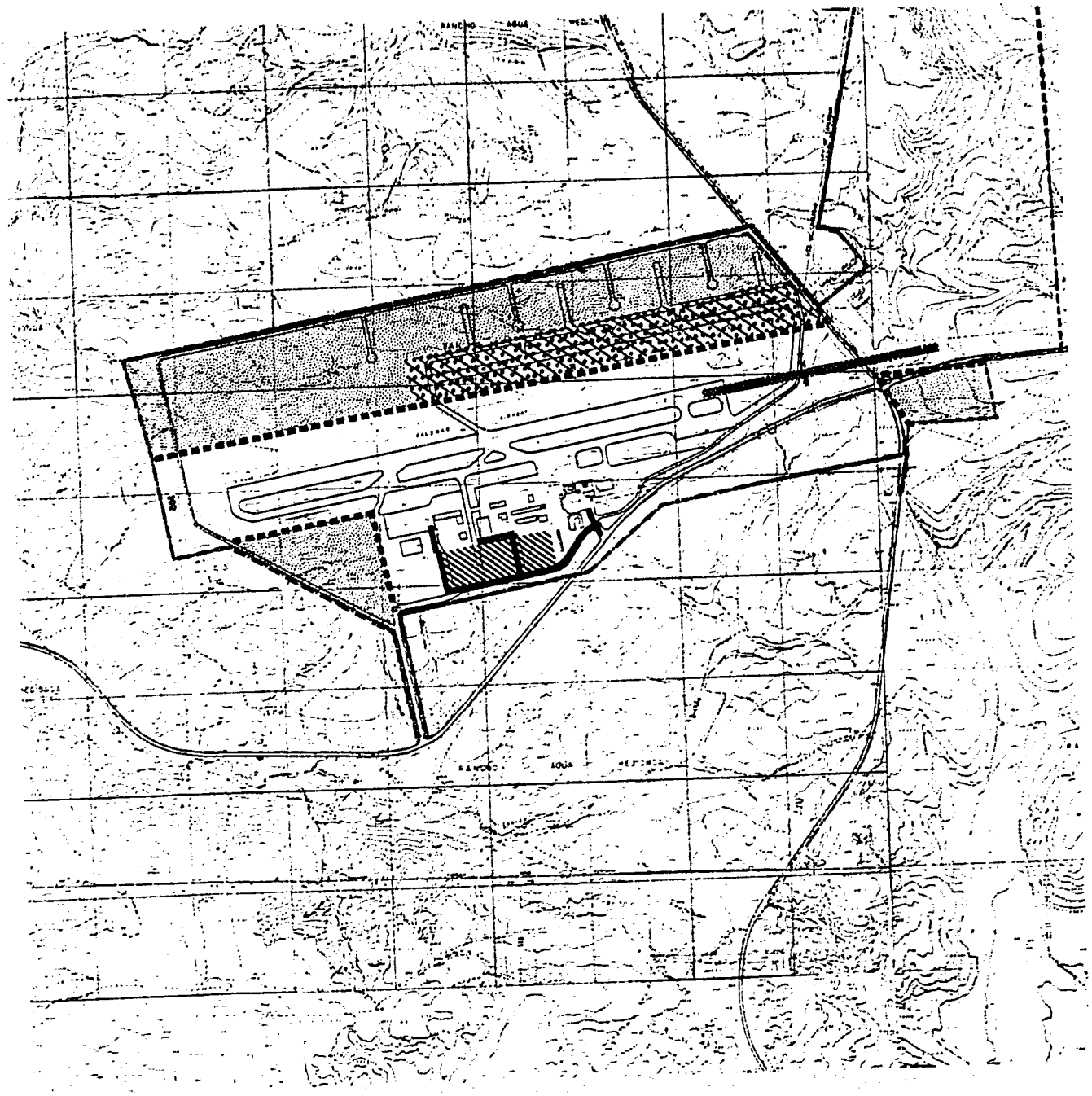
ADMINISTRATION BUILDING

FIRE/RESCUE STATION

CONTROL TOWER

Ultimate Land Use Plan

Figure 5



Development Stage — Near Term (1974 - 1976)

Figure 6

The intermediate term development is depicted in Figure 7. The intermediate term development requires the following actions:

a. Construct the north runway/taxiway system (6L/24R).

b. Construct an easterly taxiway connecting the runways.

c. Extend Runway 6R/24L and improve its effective gradient.

d. Design grading and drainage for the north FBO area.

e. Install MIRL system on Runway 6L/24R and associated taxiways.

f. Relocate Runway 24L threshold and approach lights and light runway extension and associated taxiway.

g. Install taxiway edge lights on easterly taxiway connector.

h. Install REIL system on Runway 24R.

i. Install VASI system on Runway 24R.

j. Construct north entrance road and complete the perimeter road system.

k. Install perimeter fencing.

l. Construct Fire/Rescue Station.

The long term development is depicted in Figure 8. The long term development requires the following options:

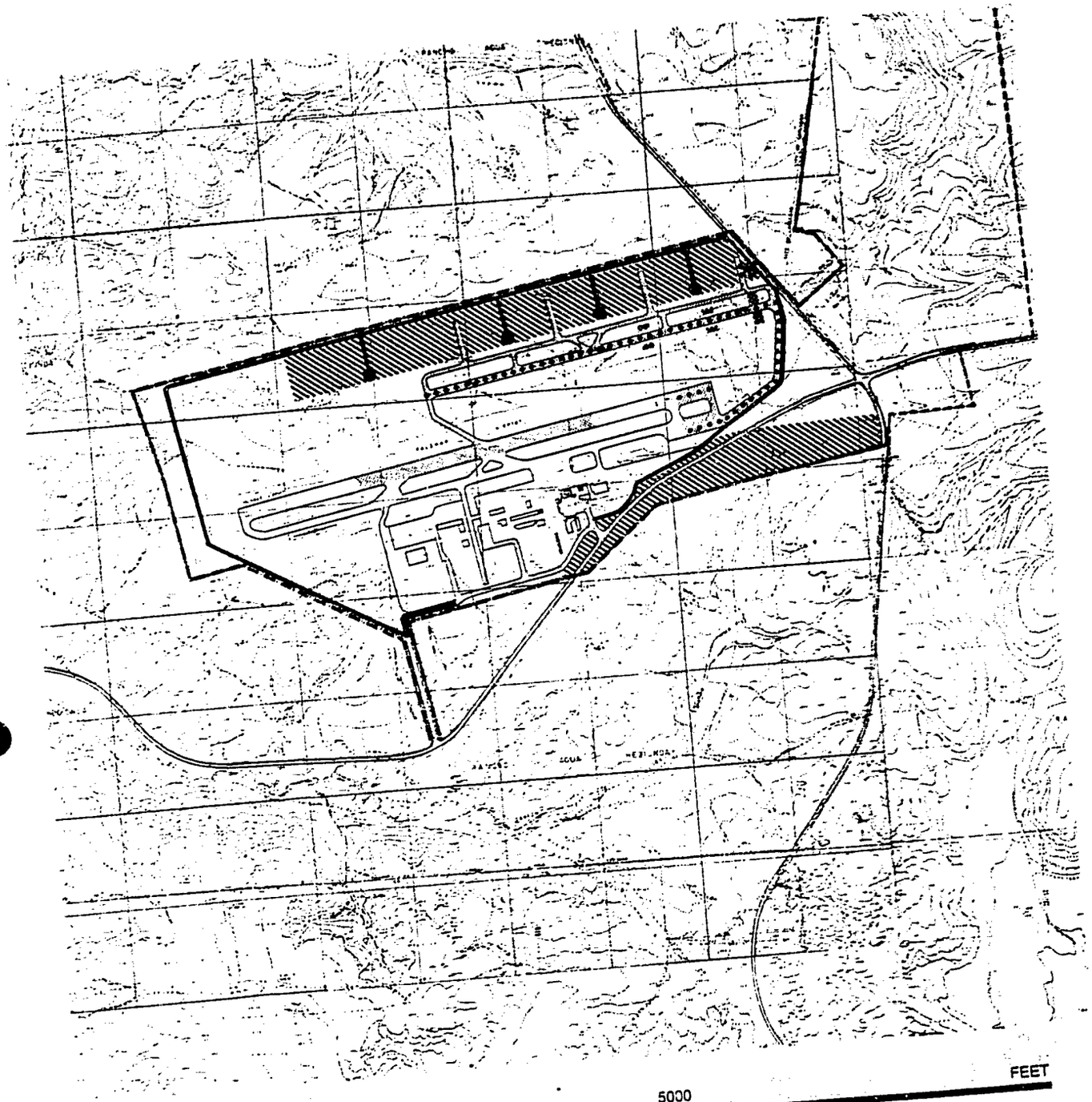
a. Design and construct westerly taxiway connector.

b. Design grading and drainage for future aviation area.

c. Install taxiway edge lights on westerly taxiway connector.

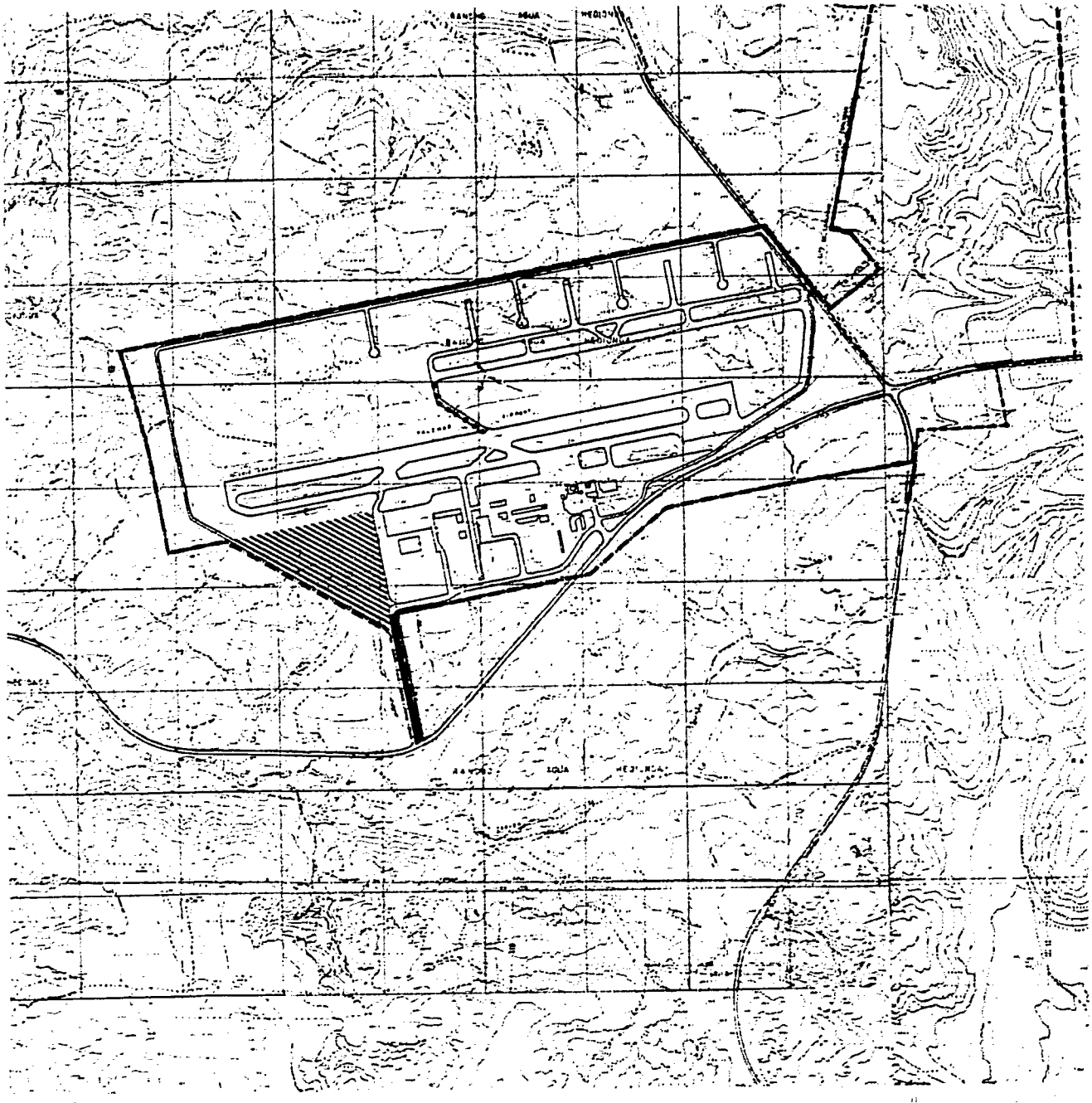
d. Design and construct additional entrance road from Palomar Airport Road to the future aviation area.

e. Install utilities in the future aviation area.



Development Stage — Intermediate Term (1976 - 1980)

Figure 7



N

0 500 1000 2000 5000 FEET

SOURCE: SAN DIEGO COUNTY AIRPORTS DIVISION — WLPA

II. AIRPORT PAVING

III. SITE PREPARATION

IV. AIRFIELD LIGHTING

VI. ROADS

AIRPORT BOUNDARY

Development Stage — Long Term (1980 - 1990)

Figure 8

Section 2
DESCRIPTION OF ENVIRONMENTAL SETTING

2.1 AMBIENT AIR QUALITY

The ambient air quality of the region surrounding Palomar Airport is very difficult to isolate from the entire volume of air within the region. Therefore, air quality is usually viewed in terms of the entire air basin because of the transport mechanisms involved. In this case the San Diego Air Basin, which extends from the border to Oceanside and from the coast to the Laguna Mountains, is the area of interest.

The ambient air quality standards are comprised of federal and state standards (Reference 4); see Table III. A definition of air pollution terms is given in Table IV (from Reference 4). Two facts should be kept in mind: 1) the California standards describe adverse conditions: thus, pollutant levels must be below the standards before the air is considered acceptable and 2) the federal standards describe acceptable conditions. Air is considered acceptable if pollutant levels equal the standards continuously and exceed them no more than once a year. In general, there is little difference between state and federal standards. Where differences exist, the more stringent standards apply.

Of the several pollutants, those due to hydrocarbons, particulates, nitrogen oxides, sulfur dioxide, and carbon monoxide are of primary importance and are summarized for the year 1972 in Table V, from Reference 5, (the latest available figures). These figures include emissions from all sources in the San Diego Air Basin.

Emissions attributable to Palomar Airport lie within the category of transportation sources as given in Table VI. These emissions were computed using emission factors developed in References 6 and 7.

Table III. Ambient Air Quality Standards Applicable in California

Pollutant	Averaging	California Standards	Federal Standards	
		Concentration	Primary	Secondary
Photochemical Oxidants (Corrected for NO_2)	1 hour	0.10 ppm (200 µg/m³)	160 µg/m³ (0.08 ppm)	Same as primary standard
Carbon Monoxide	12 hours	10 ppm (11 mg/m³)	-	Same as Primary Standard
	8 hours	-	10 mg/m³ (9 ppm)	
	1 hour	40 ppm (46 mg/m³)	40 mg/m³ (35 ppm)	
Nitrogen Dioxide	Annual average	-	100 µg/m³ (0.05 ppm)	Same as primary standard
	1 hour	0.25 ppm (470 µg/m³)	-	-
Sulfur Dioxide	Annual average	-	80 µg/m³ (0.03 ppm)	-
	24 hours	0.04 ppm (105 µg/m³)	365 µg/m³ (0.14 ppm)	-
	3 hours	-	-	1300 µg/m³ (0.5 ppm)
	1 hour	0.5 ppm (1310 µg/m³)	-	-
Suspended Particulate Matter	Annual geometric mean	60 µg/m³	75 µg/m³	60 µg/m³
	24 hours	100 µg/m³	260 µg/m³	150 µg/m³
Lead (Particulate)	30-day average	1.5 µg/m³	-	-
Hydrogen Sulfide	1 hour	0.03 ppm (42 µg/m³)	-	-
Hydrocarbons (Corrected for Methane)	3 hours (6-9 a.m.)	-	160 µg/m³ (0.24 ppm)	Same as primary standard
Visibility - Reducing Particles	1 observation	Insufficient amount to reduce the prevailing visibility to 10 miles when the relative humidity is less than 70 percent	-	-

Notes:

ppm - Parts per million. This is an engineering unit used to report gaseous pollution levels.

µg/m³ - Micrograms per cubic meter. This is the unit used to report particulate pollution levels.

pphm - Parts per hundred million.

mg/m³ - Milligrams per cubic meter.

Table IV. Definition of Air Pollution Terms

Hourly Average. The average contaminant concentration for a clock hour. Some parts of the hour have lower values than the average, some higher. There are twenty-four such values each day, starting with hour 00 and ending with hour 23.

Daily Maximum Hourly Average. The highest hourly average concentration reached every day.

Total Oxidant (O_X). All substances present in the atmosphere that can chemically react with potassium iodide (KI) to form iodine (I_2). Ozone (O_3), nitrogen dioxide (NO_2) and organic peroxides are examples. We call these substances "photochemical smog." They are the products of chemical reactions involving hydrocarbons and oxides of nitrogen in the presence of sunlight. There are seven instruments that measure total oxidants in San Diego County. They measure 24 hours a day. High concentrations of oxidants may cause eye irritation, reduce visibility, and damage plants.

Nitrogen Oxides (NO_x). Formed frequently when we burn fuel. Automobiles, power plants, and home heaters are principal sources of NO_x. Both nitric oxide (NO) and nitrogen dioxide (NO_2) are measured at three locations in San Diego County. Oxides of nitrogen participate in the photochemical reaction which produces smog.

Hydrocarbons (HC). Produced primarily by the internal combustion engine of motor vehicles. Inefficient combustion permits unburned gasoline vapors (which are composed of hydrocarbons) to escape from the tail-pipe. Some hydrocarbons are harmless, while others react with NO_2 in sunlight to produce a variety of unstable chemicals, including those which make up "photochemical smog." These chemicals can irritate eyes and damage plants.

Carbon Monoxide (CO). Also produced primarily by the internal combustion engine. Carbon monoxide has 200 times the affinity for hemoglobin in the blood that oxygen does. Hemoglobin can become so loaded with carbon monoxide that it cannot carry oxygen as it should. CO concentrations as low as 40 ppm may cause some individuals difficulty in breathing.

Sulfur Dioxide (SO_2). Formed when sulfur-containing fuels are burned. High levels of SO_2 irritate the nose, throat, and lungs.

Suspended Particulate Matter. Any dust, smoke, or spray which can be collected. This material is weighed and computed as to how much there is in one cubic meter of air. High concentrations of suspended matter will soil your laundry and make housekeeping difficult. Some of the material collected is oily, and this is measured also. Oily matter is determined by extraction with benzene.

Particulate Soiling Index. Determined by automatic samplers using a paper tape. The unit of measurement (COH) is based on the reduction of light transmission through a paper filter. COH stands for coefficient of haze. COH units less than 1.0 indicate relatively clean air. Clay-type dusts are common in San Diego and are clearer than coal dust.

Table V. 1972 Summary of Air Contaminant Emissions, San Diego Air Basin

	1972 Emissions (Tons/Day)				
	Hydro-carbons	Particu-lates	NO_2	SO_2	CO
STATIONARY SOURCES	7.03	21.8	0.82	-	30.4
Industrial	1.96	10.8	78.70	30.3	4.0
Fuel Combustion	1.96	1.6	0.17	-	7.9
Refuse Disposal	80.37	15.9	-	-	-
Hydrocarbon Evaporation	189.60	8.9	85.30	5.7	1279.7
TRANSPORTATION SOURCES	281	59	165	36	1322
TOTAL					

Table VI. Palomar Airport 1973, Emissions in Pounds/Day

Sources	Hydro-carbons	Particu-lates	NO_2	SO_2	CO
Motor Vehicles	449	22	430	14	3366
Industry	Negligible				
Aircraft	174	111	111	12	5044
Evaporation (Fuel)	142	-	-	-	-

The aircraft engine emission factors are given in terms of pounds per engine per takeoff/landing. The number of daily takeoffs and landings were derived as follows:

$$\frac{\text{Annual Operations}}{\text{360 Days}} \times \frac{\text{1.5 Busy Day Factor}}{\text{2 Operations/Takeoff and Landing}} = \text{No. of Takeoffs/Landings}$$

Automobile emission factors are from Reference 7. For purposes of this report it was assumed that the typical trip length for each automobile was 40 miles.

The tenants at Palomar Airport are not industrial. The tenants produce a negligible emission percentage compared to the total San Diego Air Basin emissions (approximately 0.01 percent).

Present hydrocarbon emissions from fuel are the result of fueling, fuel storage in eight 10,000-gallon fuel tanks at Palomar Airport, and Hughes Tool Company operations. This results in hydrocarbon emissions of 32 pounds/day breathing loss and approximately 110 pounds/day working loss, based on 10,000 gallons/day of fuel sales.

2.2 NOISE

The existing noise atributable to the airport is that from current takeoff and landing operations and related auto traffic. There are a number of criteria to describe the most common noise factors. Those currently in use are the community noise equivalent level (CNEL), composite noise rating (CNR), and noise exposure forecast (NEF).

The CNEL is an energy integrated measure of the noise at a given position over a minimum of a 24-hour period with appropriate weighting factors for day, evening, and nighttime periods. It is used in the noise standards for California airports, Reference 8.

The CNR is a measure of the noise produced by aircraft operations and is calculated from the perceived noise level and the number of daytime and nighttime operations and runway utilization. It is utilized by the Department of Defense and the Federal Aviation Administration to define the noise around airports (Reference 9).

The NEF is a measure of the noise environment produced by aircraft operations. The NEF is an updating of the CNR procedures. It is computed using noise expressed in effective perceived noise levels (EPNL) and the number of operations during daytime and nighttime periods (References 10 and 11). The factors involved in each type of measure are given in Table VII for illustrative purposes (Reference 12).

Table VII. Factors Used in CNEL, CNR, and NEF Computations

Absolute Noise Level	PNL or A-Level	CNR or CNEL	NEF
Noise Spectrum			
Mix of Aircraft			
Number of Operations			
Runway Utilization			
Time of Day			
Flight Path			
Aircraft Type			
Maximum Tone			
Noise Duration			

For convenience in relating these terms, the following equations from Reference 13 are given for estimating CNEL, NEF, and CNR values for fly-overs of a given noise level.

$$CNEL = SENEL + 10\log_{10}(N_D + 3N_E + 10N_N) - 49.4$$

$$NEF = EPNL + 10\log_{10}(N_D + N_E + 16.67N_N) - 88$$

$$CNR = PNL + 10\log_{10}(N_D + N_E + 16.67N_N) - 13$$

where

N_D = number of operations during 0700-1900 hours

N_E = number of operations during 1900-2200 hours

N_N = number of operations during 2200-0700 hours

The composite noise rating CNR will be used. The basic input for computing CNR includes the number of operations for each type of aircraft using the airport, runway utilization, and the time of day operations occur. The demand forecast, Reference 14, yields the total 1973 operations of 201,000 with single-engine aircraft representing 80 percent of operations, twin-engine aircraft representing 19 percent of operations, and jets representing 1 percent of operations. A busy day factor of 50 percent is assumed; thus, average busy day operations are 826 per day.

Figure 9 shows the 100-CNR contour for the year 1973 without the tower. The basic flight paths are depicted along with the percent flight path utilization. The 100-CNR contour is defined by the small number of business jets and the large volume of single engine propeller aircraft.

Composite noise ratings are used to assess the expected response of residential communities. This empirically developed relationship, from Reference 9, is shown in Table VIII. Additionally, CNRs are used as guidelines for planning purposes. Land use compatibility is shown in Table IX. Based on these data the location of the 100-CNR line which separates the Zone 1 and Zone 2 is most critical. The annual aircraft operations are given in Table X.

Additional noise sources related to airport use are ground run-up operations, helicopters and helicopter runups, as well as vehicular noise, both automobiles and trucks. The traffic volume related to general aviation and fixed base operator activity is estimated to be 850 automobiles per day (Reference 14). Assuming a 12-hour day and using the peak hourly levels in Table XI, the vehicles per hour are 102. This has an A-weighted noise level of 66 dBA at 50 feet, computed from data in Reference 15.

Table VIII. Chart for Estimating Response of Residential Communities from Composite Noise Rating

Composite Noise Rating		CNR Zone	Description of Expected Response
Takeoffs and Landings	Runups		
Less than 100	Less than 80	1	Essentially no complaints would be expected. The noise may, however, interfere occasionally with certain activities of the residents.
100 to 115	80 to 95	2	Individuals may complain, perhaps vigorously. Concerted group action is possible.
Greater than 115	Greater than 95	3	Individual reactions would likely include repeated, vigorous complaints. Concerted group action might be expected.

Table IX. Land Use Compatibility Chart for Aircraft Noise

Composite Noise Rating			Land Use Compatibility								
Takeoffs and Landings	Runups	CNR Zone	Residential	Commercial	Hotel, Motel	Offices, Public Buildings	Schools, Hospitals, Churches	Theatres, Auditoriums	Outdoor Amphitheatres, Theatres	Outdoor Recreational (Nonspectator)	Industrial
Less than 100	Less than 80	1	Satis	Satis	Satis	Satis	Note (C)	Notes (A, C)	Note (A)	Satis	Satis
100 to 115	80 to 95	2	Note (B)	Satis	Note (C)	Note (C)	Note (C)	Notes (A, C)	Note (A)	Satis	Satis
Greater than 115	Greater than 95	3	Unsat	Note (C)	Note (C)	Unsat	Unsat	Unsat	Unsat	Satis	Note (C)

Notes: (A) - A detailed noise analysis should be undertaken by qualified personnel for all indoor or outdoor music auditoriums and all outdoor theatres.
(B) - Case history experience indicates that individuals in private residences may complain, perhaps vigorously. Concerted group action is possible.
(C) - An analysis of building noise reduction requirements should be made and needed noise control features should be included in the building design.

Table X. Palomar Airport Annual Aircraft Operations

Year	Total	Single Engine	Twin Engine	Jet
1973	201,000	160,800	38,190	2,010
1975	232,000	185,600	44,080	2,320
1980	259,000	204,611	49,209	5,180
1990	402,000	301,500	88,440	12,060

Table XI. Peak Vehicular Traffic

Year	Peak Hourly Vehicular Traffic
1973	102
1975	124
1980	174
1990	368

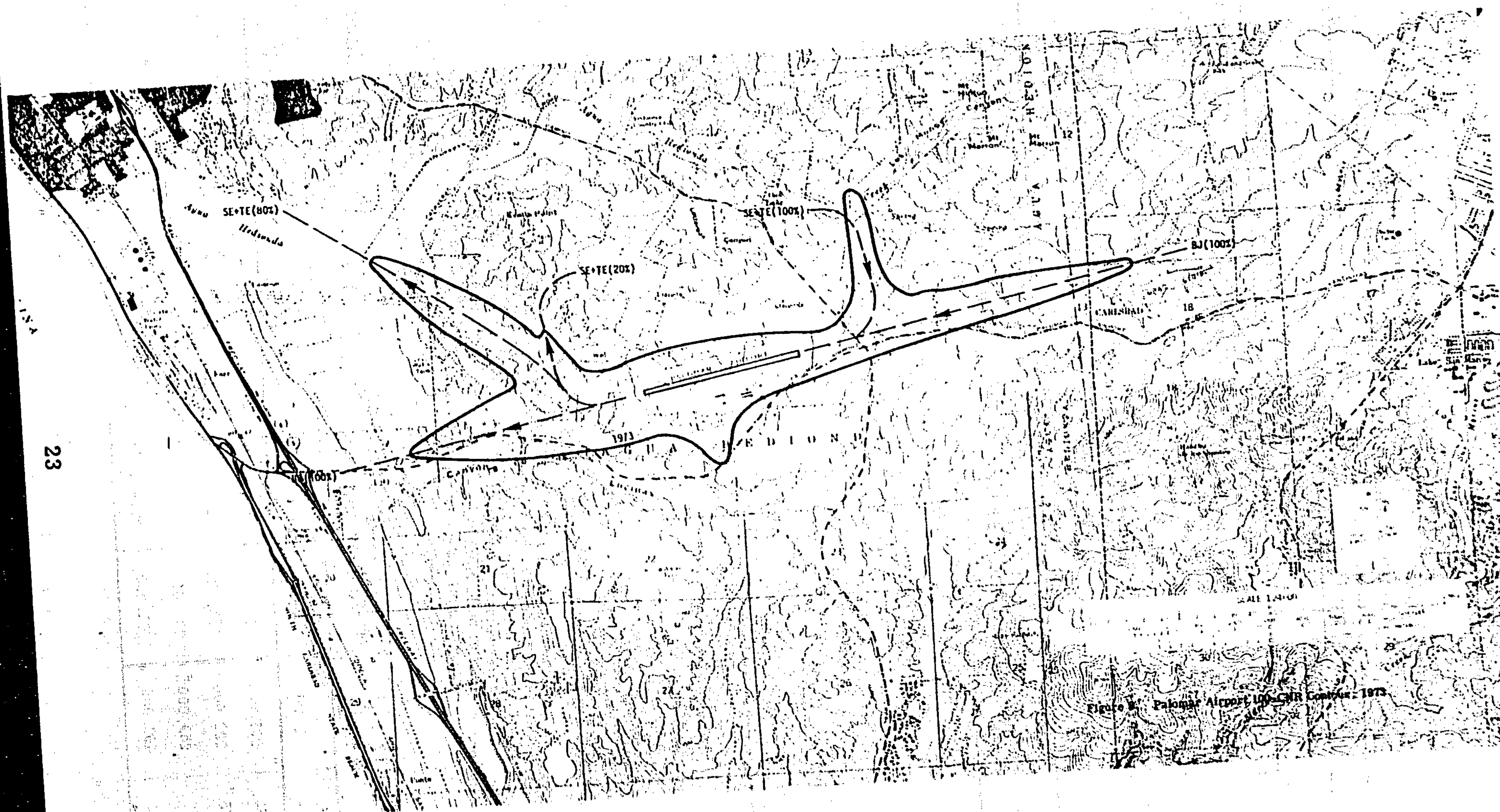


Figure 8. Palomar Airport 100-CNR Contour - 1973

Noise measurements were made on 22 August 1973. Noise measurements include both ambients and single events in the two time periods, daytime and nighttime. Data were acquired at five measurement sites (Figure 10) and presented in Table XII. A B&K sound level meter was used along with a stopwatch. A-weighted levels were used.

2.3 WATER QUALITY AND DRAINAGE

The water supply for Palomar Airport is supplied by the Carlsbad Municipal Water District. The present water system consists of two parallel lines from the Carlsbad water district. One is 6 inches in diameter and supplies the Palomar Airport water. The other is 10 inches in diameter and was built by the Hughes Tool Company to provide sprinkler system water to their assembly and test facility. The 6-inch water main is inadequate for the present airport facilities. It presents a fire prevention hazard and allows for no expansion (Reference 16). The 10-inch main is used totally by the Hughes Tool Company.

Waste water and sewage from Palomar Airport is handled by the Buena trunk line which runs parallel to Palomar Airport Road and connecting to the City of Carlsbad sewage system. The system consists of a forced main passing 3.2 million gallons per day from the east to El Camino Real, at which time the main becomes gravity fed with a reduced capacity of 1.8 million gallons per day (Reference 17). Palomar Airport is connected to the Buena trunk line with an 8-inch main. The County of San Diego is in lease for 10,000 gallons/day of sewage. In 1970 the usage was 4400 gallons/day for Palomar Airport and in 1973 the usage was 4000 gallons/day. The reduction was due to the cutback at Hughes Tool Company. The company is expanding and a safe usage figure for 1974 would be 5000 gallons/day. This leaves a 5000-gallon/day excess capacity. In addition, San Marcos will construct a parallel line to the Buena trunk line.

Drainage from the Palomar Airport follows no major streams but drains over non-infiltrating ground, following the lay of the land. Drainage of the northern airport boundary is towards the north into a canyon which

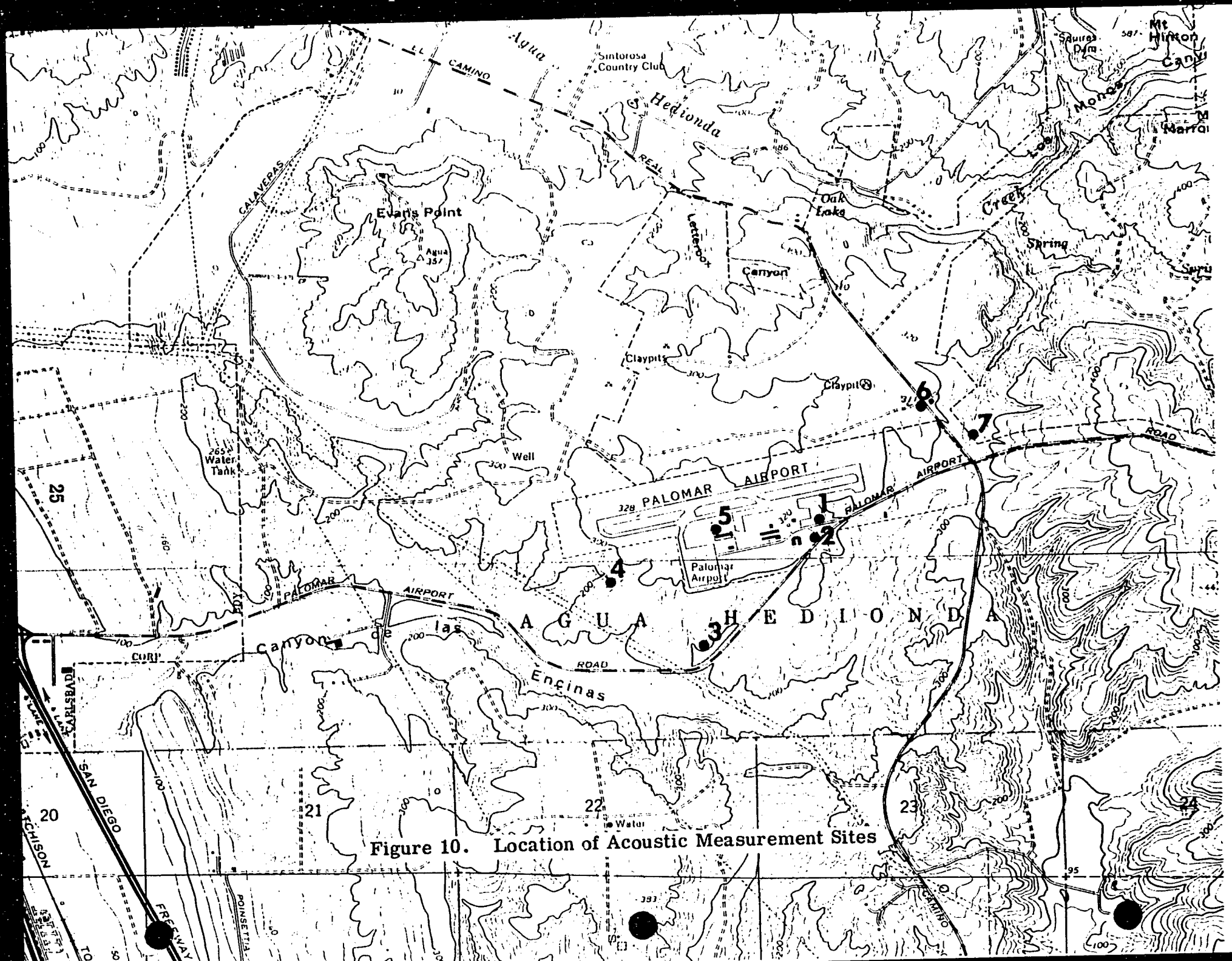


Figure 10. Location of Acoustic Measurement Sites

Table XII. Noise Measurement Data

Location	Time	dB(A)	Duration*	Remarks
Site 1 West of tower	11:26 a.m.	72.0	S/E 25 sec	Start at 9:40 a.m., 8/23/73 directly in beam of takeoff point
		66.0	-	Aircraft taxiing
Site 2 Corner of Palomar Airport Road and entrance	11:32 a.m.	68.0	-	Light traffic
Site 6	11:40 a.m.	64.0	S/E 25 sec	Dog barking
Next to county animal shelter	11:41 a.m.	72.0	-	On-street measurement
Site 7	11:45 a.m.	88.0	S/E 10 sec	Trash truck, 10 ft away
Under approach path	11:45 a.m.	65.0	S/E 45 sec	Airplane landing on final 172 Cessna
Site 3 Near future access road	12:05 p.m.	56.0	-	General aircraft noise
Site 5 Aircraft parking by taxiway on west side	12:00	44.0	S/E 30 sec	Comanche single engine
Site 4 Unaccessible				
Site 6	10:26 p.m.	55.0	-	Traffic very light, dog barking
Site 7	10:35 p.m.	74.5	S/E 10 sec	Compressor, generator, water pump
	10:36 p.m.	55.0	S/E 40 sec	Beechcraft final
	10:37 p.m.	63.5	S/E 43 sec	Cessna final
	10:38 p.m.	65.0	S/E 35 sec	Cessna final
	10:40 p.m.	67.0	S/E 30 sec	Cessna final
	10:42 p.m.	65.0	S/E 30 sec	Beechcraft final
	10:44 p.m.	60.0	S/E 45 sec	Cessna final
Site 2 Palomar Airport Road	10:49 p.m.	40.0	-	Crickets
	10:50 p.m.	68.0	-	Traffic, light
Site 3	10:55 p.m.	39.0	-	Crickets
Site 5	11:00 p.m.	41.0	-	Crickets

* NOTES: 1. Dash (-) indicates 60-second duration unless otherwise noted.

2. Duration is the time above surrounding background noise.

consists of a small creek leading to a sheet runoff area that empties into Agua Hedionda and, thus, the ocean. Drainage of the south and west boundaries of the airport drain south to a small creek within a canyon. This water runs west to the ocean and enters the ocean at the south end of the Carlsbad corporate boundary near the sewage facility for the City of Carlsbad. The eastern airport boundary drainage proceeds south to a canyon and follows a creek to sheet run-off areas and proceeds to the ocean through Batiquitas Lagoon. Soils surrounding the Palomar Airport are mainly expansive clays and hardpan with little water absorbing capacities.

Present airport fuel spillage is left to the natural run-off areas without treatment. There are no hose-down facilities with holding tanks.

2.4 CURRENT FLORA AND FAUNA

The region surrounding Palomar Airport is a zone of integration between coastal sage scrub and communities of chaparral. The fauna inhabiting the region is typical of such communities. The fauna inhabiting some of the agricultural lands in this area is less diverse and representative of a large rodent population dominated by Beechey's ground squirrel. These species comprise a food base upon which various mammalian, avian, and reptilian predator species feed (Reference 18). (Table XIII is a detailed wildlife description.)

Little natural vegetation remains in the area. That which remains is isolated and "relictual" in nature. The entire area, with the exception of some islands of natural vegetation and the steeper slopes is, or has been, disturbed. Most of this disturbance is, or has been, associated with agriculture. Some areas show evidences of parcels long out of cultivation which are in various successional stages of reversions to natural vegetation. Most of these parcels are populated by various weedy species and are not representative of climax plant communities (Reference 18). (Table XIV is a detailed plant life description.)

Table XIII. Wildlife Checklist

Animal Species	Probable	Spotted
MAMMALS		
California Ground Squirrel (Citellus beecheyi)		X
Nimble Kangaroo Rat (Dipodomys agilis)	X	
Desert Wood Rat (Neotoma lepida)	X	
California Mouse (Peromyscus californicus)	X	
Short-eared Pocket Mouse (Perognathus fallax)		X
Mule Deer (Odocoileus hemionus)	X	
Coyote (Canis latrans)	X	
Gray Fox (Urocyon cinereoargenteus)	X	
Bobcat (Lynx rufus)	X	
Brush Rabbit (Sylvilagus bachmanni)		X
Dusky-footed Woodrat (Neotoma fuscipes)	X	
California Pocket Mouse (Perognathus californicus)	X	
BIRDS		
Costa's Hummingbird (Calypte costae)	X	
Cactus Wren (Campylorhynchus brunneicapillum)	X	
Lazuli Bunting (Passerina amoena)	X	
Wrentit (Chamaea fasciata)	X	
Brown Towhee (Pipilo fuscus)	X	
Sage Sparrow (Amphispiza belli)		X
Rufous-crowned Sparrow (Aimophila ruficeps)	X	
Mountain Quail (Oreortyx pictus)	X	
Scrub Jay (Aphelocoma coerulescens)		X
Poor-will (Phalaenoptilus nuttallii)	X	
Bewick's Wren (Thryomanes bewickii)	X	
California Thrasher (Toxostoma redivivum)	X	
Rufous-sided Towhee (Pipilo erythrophthalmus)	X	
Orange-crowned Warbler (Vermivora celata)	X	
REPTILES		
Western Fence Lizard (Sceloporus occidentalis)	X	
Striped Racer (Masticophis lateralis)	X	
Western Rattlesnake (Crotalus viridis)	X	
Southern Alligator Lizard (Gerrhonotus multicarinatus)	X	
Coast Horned Lizard (Phrynosoma coronatuna)	X	
INVERTEBRATES		
Ringlet (Coenonympha tullia)	X	
Common Checkspot (Euphydryas chalcedona)	X	
Leanira Checkerspot (Melitaea leanira)	X	
Bramble Hairstreak (Calophrys dumetorum)	X	
Mormon Metalmark (Apodemia mormo)	X	
Ceanothus Silk Moth (Platysamia euryalus)	X	
Another Silk Moth (Saturnia walterorum)	X	
Gray Hairstreak (Strymon adenostomatis)	X	
Hedgerow Hairstreak (Strymon saepium)	X	
Arota Copper (Lycaena arota)	X	
Callippe Fritillary (Speyeria callippe)	X	
Flat-headed Borer or Buprestid (Acmaeodera mariposa)	X	
California Timema (Timema californica)	X	
AMPHIBIANS		
Pacific Tree Frog (Hyla regilla)	X	
Introduced Bullfrog (Rana calesbiana)	X	

Table XIV. Plant Life Checklist

Plant Species	Location*	Abundance**
California Wormwood or Sagebrush (Artemisia californica)	UC	C
White Sage (Salvia apiana)	UC	C
Black Sage (Salvia mellifera)	UC	C
Encelia (Encelia farinosa)	UC	C
Yerba Santa (Eriodictyon californica)	UC	C
Eriophyllum (Eriophyllum confertiflorum)	UC	C
California Buckwheat (Eriogonum fasciculatum)	UC	C
Lemonade-berry (Rhus integrifolia)	UC	I
Prickly pears (Opuntia spp.)	UC	C
Our Lord's Candle (Yucca whipplei)	UC	I
Chamise (Adenostoma fasciculatum)	UC	I
Scrub Oak (Quercus dumosa)	UC	C
Foothill Ash (Fraximus dipetala)	UC	I
Hard Tack (Cercocarpus betuloides)	UC	C
Wild Lilacs (Ceanothus cordulatus, C. greggii, C. leucodermis, C. megacarpus, C. crassifolius, etc)	UC	C
Holly-leaf Cherry (Prunus ilicifolia)	UC	I
Bear Bush (Garrya fremontii)	UC	I
Quinine Bush (Garrya flavescens)	UC	I
Manzanitas (Arctostaphylos pungens, A. pringlei, A. glauca, A. glandulosa, etc)	UC	I
Toyon (Heteromeles arbutifolia)	UC	I
Sugarbush (Rhus ovata)	SD	I
Willows (Satix spp.)	SD	C
Common Tule (Scirpus acutus)	SD	C
California Bulrush (Scirpus californicus)	SD	I

* UC - UNCONSOLIDATED AND DISTURBED
SD - STREAMSIDE AND DISTURBED

** A - ABUNDANT
C - COMMON
I - INFREQUENT

There were no rare or endangered floral or faunal species encountered or known to occur in the Palomar Airport region. Additionally, no rare or endangered species are known to occur in contiguous regions.

2.5 GEOLOGY

Palomar Airport covers an area underlain by a Pleistocene age wavecut terrace which has been dissected by local drainages. A large percentage of the area has been extensively modified by grading for present airport facilities and adjacent sanitary landfills. There are several geologic formations underlying the Pleistocene terrace (Reference 19).

The oldest formation in the airport area is the Santiago Peak formation. These metavolcanic rocks are usually very hard, fine-grained andesite and dacite porphyrys, which exhibit a wide range of colors. Some metasedimentary rocks are intermixed with the metavolcanics.

The Point Loma formation underlies the northern portion of the area. The Point Loma formation consists of interbedded, greenish-brown, fossiliferous siltstones and shales with some well-hardened, ledge-forming sandstones. Most of the Point Loma formation on the airport site has a thick cover of clayey paleosoil. This paleosoil consists of pink, purple, and white mottled kaolin clay.

The basic formation rocks are covered by Torrey Sandstone. Torrey Sandstone is a fine to coarse grained moderately cemented light-brown to gray sandstone containing beds of yellow silty sandstone and yellow to green-gray sandy mudstone.

A small amount of terrace deposite material remains in the area. It is known as Linda Vista formation and consists of numerous well-rounded cobbles in a red-brown sandy matrix.

The sedimentary units in this area are nearly flat-lying. Only the Point Loma formation, which strikes north-south and dips 5 to 10 degrees to the west, shows significant variance from horizontal bedding (Figure 11).

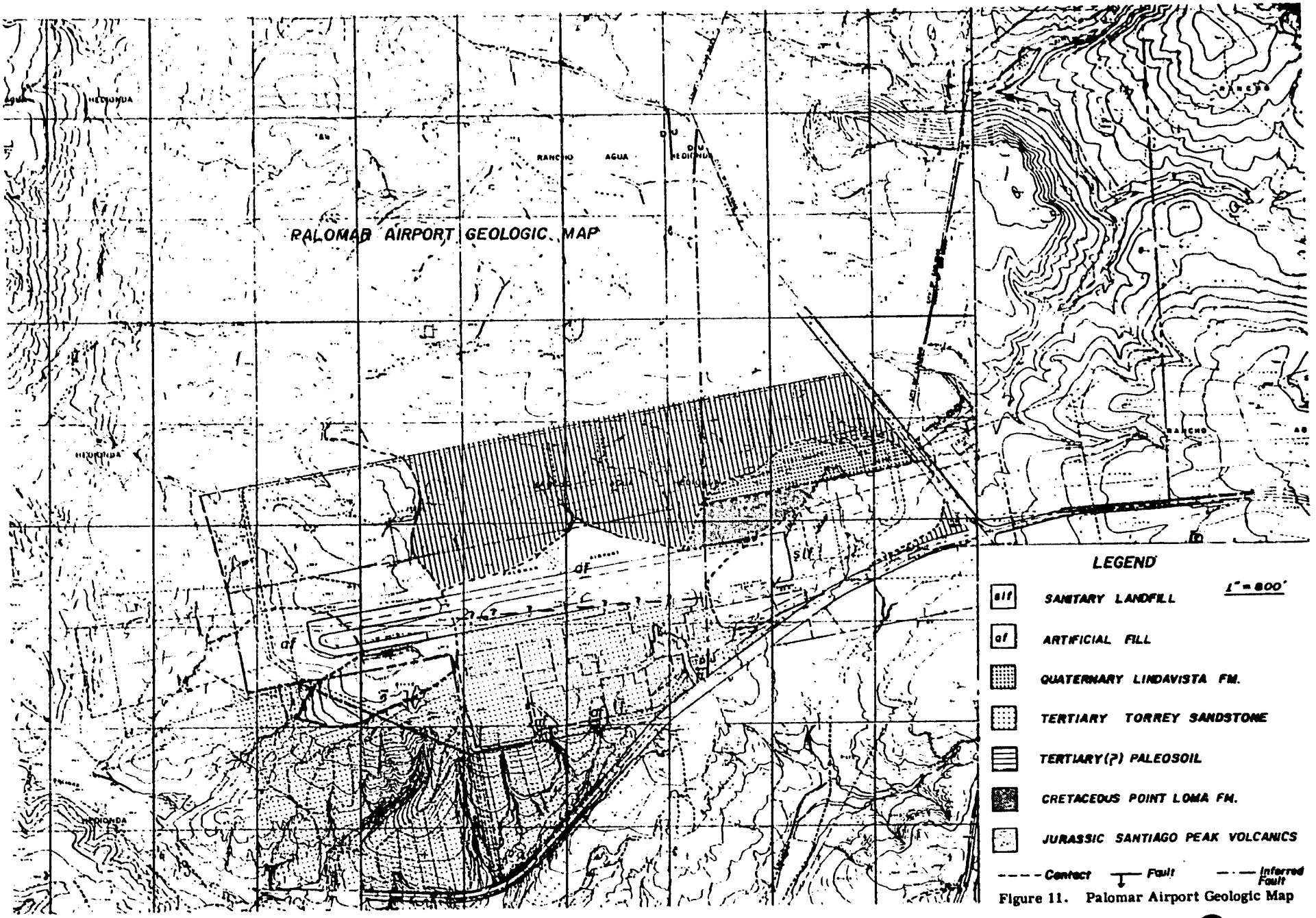


Figure 11. Palomar Airport Geologic Map

No major faults have been mapped in this area according to the most recent fault maps available. A small local fault showing only a few feet of dip-slip displacement in the formation sediments was mapped in the area. This fault is exposed just east of the entrance road to Palomar Airport on the north side of Palomar Airport Road. It is shown as connecting with a fault of similar attitude and displacement that can be seen north of this project site in a road cut on El Camino Real. Actual surface evidence of faulting between these two points was not encountered. Several linear features can be seen in photographs of the area to the north and west of the airport boundaries. Some of these features are probably surface expressions of local faults.

The presence of a minor fault through the airport property is considered seismically insignificant. The absence of surface expression would indicate the fault is preholocence and should probably be classified as inactive.

Major ground shaking in this area due to an earthquake would probably be caused by movement along the Elsinore or San Jacinto fault zones, which are approximately 23 and 50 miles away, respectfully. Earthquakes with magnitudes in the range of 7.5, Richter Scale, may occur along these faults.

The possible extension of the Newport-Inglewood fault zone southerly to the Rose Canyon fault is currently under investigation. Such an extension would pass within seven miles of this project. A credible event of 7.1 magnitude would be reasonable for a fault of such length. The project area falls into a zone which Greensfelder has assigned a maximum bedrock acceleration of 0.4g.

2.6 ARCHAEOLOGY

2.6.1 Introduction

An archaeological survey for the proposed Palomar Airport Master Plan was performed by the San Diego County Engineering Department for the Department of General Services, Airport Operations Division, Reference 20. The survey was conducted on 19, 26, 29 August and 3 September 1974.

The purpose of the survey was to locate, map, and record in the field any archaeological or historical sites found within the boundaries of the proposed project. The survey was performed on 480 acres (Figure 12) surrounding the present airport boundaries.

The results of the survey were positive, with two archaeological sites discovered within the boundaries of the proposed Palomar Airport Master Plan.

2.6.2 Cultural History – Archaeological Background

The area in and around the Palomar Airport was inhabited by three major culture groups in the prehistoric period. The San Dieguito culture group flourished from about 10,000 to 4000 years ago and was characterized by large stone tools and the absence of pottery. From 4000 to 1000 years ago the La Jollan culture was in existence and is noted by its use of grinding equipment and burial by inhumation, in addition to fairly large stone tools. The last culture group, the Diegueño (Kumayay) was characterized by the presence of pottery, burial by cremation, and much more refined stone tools. The Diegueño (Kumayay) culture existed from 1000 years ago until the present.

2.6.3 Cultural History - Historical Background

With the discovery of California by early Spanish explorers, the life way of the Diegueño (Kumayay) was drastically interrupted and has since changed very radically. After the establishment of Mission San Luis Rey

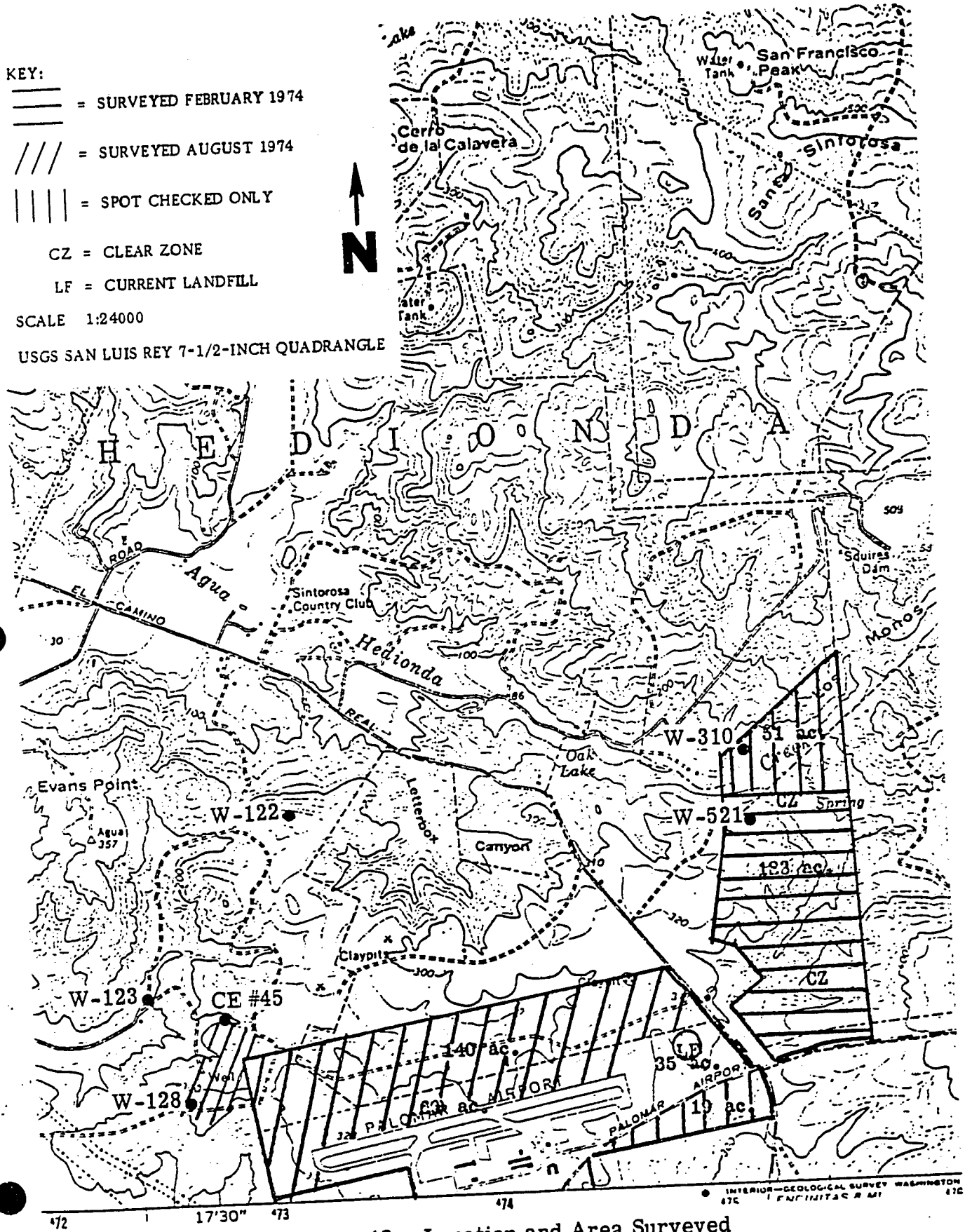


Figure 12. Location and Area Surveyed

de Francia in 1798, located roughly nine miles north of the Palomar Airport Master Plan, a slow development process began. The padres of the mission were involved in a great many activities, one of which involved dam construction.

Following the mission period in California history, the rancho era began. The Agua Hedionda Rancho, consisting of 13,311 acres, was granted in 1842. The rancho extended inland almost to the present City of Vista from the Pacific Ocean. The rancho was passed down through three families. The last family to own the Agua Hedionda Rancho was that of Robert Kelley. After his death in 1890, the rancho was given to his nine nephews and nieces who subsequently divided up the land.

The majority of the area around the proposed Palomar Airport Master Plan has been utilized since the division of the rancho primarily for cattle grazing and agricultural purposes. Clay mining operations have occurred in the recent past about a mile north of the project.

2.6.4 Archaeological and Historical Resources

To discover the existence of any currently recorded archaeological or historical sites within or around the boundaries of the proposed Palomar Airport Master Plan, records were reviewed with the San Diego Museum of Man and the Anthropology Laboratory at San Diego State University. Both institutions are repositories of recorded archaeological and historical data for the local area. In addition, Section 2 of the Natural Resource Inventory of San Diego County was examined for related information.

The San Diego Museum of Man indicated the presence of six previously recorded archaeological sites within or around the proposed Master Plan boundaries. Two sites fall within the project area (Sites W-310 and W-521). Both of the sites are located east of El Camino Real in an area designated as Clear Zone. As such, they will not be developed and should not suffer any impact from this project.

The Anthropology Laboratory at San Diego State University reported no previously recorded archaeological or historical sites in the immediate vicinity of the project area.

Previous surveys of surrounding projects revealed no sites which would be affected by the proposed project.

2.6.5 Site Descriptions

During the survey two archaeological sites previously undiscovered were found.

2.6.5.1 CE #44. The site may be located on the USGS San Luis Rey 7-1/2-inch Quadrangle, Township 11 south, Range 4 west, section and quarter section not available. The site is found in a wide canyon bottom at an elevation of about 100 feet. Areal extent of the site is approximately 1500 × 1000 feet. Agua Hedionda Creek flows 50 feet to the west.

The site is located on private property about 1/2 mile north of the western edge of the proposed Clear Zone for Palomar Airport. It is bisected by Sunny Creek Road and is 1/2 mile southeast of the intersection of El Camino Real and Sunny Road (Figure 12).

Noted on the surface of the site was an abundance of shell, primarily of the pecten and chione species. Soil was a light gray midden, with rodent holes indicating at least 18 inches of depth. Artifacts observed were manos, tools, and flakes. No artifacts were collected.

Because the site contains characteristics of the La Jollan culture group, it has been assigned as a La Jollan site, possibly a village site. At this point, significance of the site ranges from moderate to major. Further investigation of the site is deemed a necessity to aid in the determination of its significance. The site will not be impacted by this proposed project due to the site's distance from the project.

2.6.5.2 CE #45. Located in Township 11 south, Range 4 west, section and quarter section not available on the USGS San Luis Rey 7-1/2-inch Quadrangle. The site is on a small knoll top, elevation 260 feet, and is 500

feet northeast of site number W-128. Palomar Airport is approximately 1200 feet southeast of the site (Figure 12).

The site consisted of scattered mano fragments, tools, flakes, and shell, with a thinly scattered midden which appears to have little or no depth. It resembles the La Jollan site pattern, and was, from surficial indications, used as a campsite. It is from moderate to minor in significance. Due to its proximity to the project's northwestern boundary, it could possibly be affected or impacted by it.

Section 3

ENVIRONMENTAL IMPACT OF THE PROPOSED PROJECT

3.1 IMPACT ON AIR QUALITY

The proposed development will result in the growth of airport operations in terms of aircraft and automobiles. Projected aircraft operations are given in Table X. The projected surface vehicular traffic is given in Table XV. Refer to Table XVI for the resultant air quality.

Table XV.. Palomar Airport Average Daily Trips

Year	Total	Cars	Trucks
1973	850	824	26
1975	1035	1004	31
1980	1450	1407	43
1990	3065	2973	92

Table XVI. Air Quality - Palomar Airport

Year	Source	Pounds/Day				
		Hydro-carbons	CO	NO_2	Parti-culates	SO_2
1973	Aircraft	174	5,044	111	111	12
	Vehicular	449	3,366	430	22	14
	Misc	142	-	-	-	-
1975	Aircraft	200	5,828	131	131	15
	Vehicular	364	3,188	446	9	16
	Misc	142	-	-	-	-
1980	Aircraft	228	6,536	183	183	27
	Vehicular	510	4,466	625	13	23
	Misc	187	-	-	-	-
1990	Aircraft	363	10,144	388	388	59
	Vehicular	1079	9,440	1322	27	49
	Misc	220	-	-	-	-

Table XVII. Percentage Increase of an Emission Over Base Year 1973

Year	Pounds/Day (Year) at Palomar Airport / Pounds/Day (1972) in San Diego Air Basin x 100 (%)				
	Hydro-carbons	CO	NO_2	Parti-culates	SO_2
1973	0.14	0.32	0.16	0.11	0.05
1975	0.13	0.34	0.17	0.12	0.06
1980	0.17	0.42	0.25	0.17	0.10
1990	0.30	0.74	0.52	0.35	0.21

If these emissions are compared on a percentage basis with the total transportation emissions using 1972 as a base year, the percentage increase is shown in Table XVII. This assumes that emission controls on automobiles have been implemented at least to 1975 standards (Reference 6), but that no emission controls on general aircraft have been implemented.

3.2 IMPACT ON NOISE

The aircraft operations at Palomar Airport are expected to experience a pattern of growth as indicated in Table X. The overall trend of the noise contours would be one of growth, if one assumes present day technology. Figures 13, 14, and 15 show the growing 100-CNR contours along with projected flight paths and percent of flight path utilization. However, this assumption is not warranted due to the current work in noise reduction being performed by NASA and airframe/engine manufacturers. Thus, the computation of the noise contours for 1975, 1980, and 1990 were performed using the assumptions given in Table XVIII. The incremental 5-dB noise reduction for business jets is based on the need for complying with FAR Part 36 and the need to remain competitive (noise reduction wise) to the Cessna Citation. See Figure 16 for a comparison of current business jet noise levels with FAR Part 36 and the assumed noise reduction due to technological advances (Reference 21).

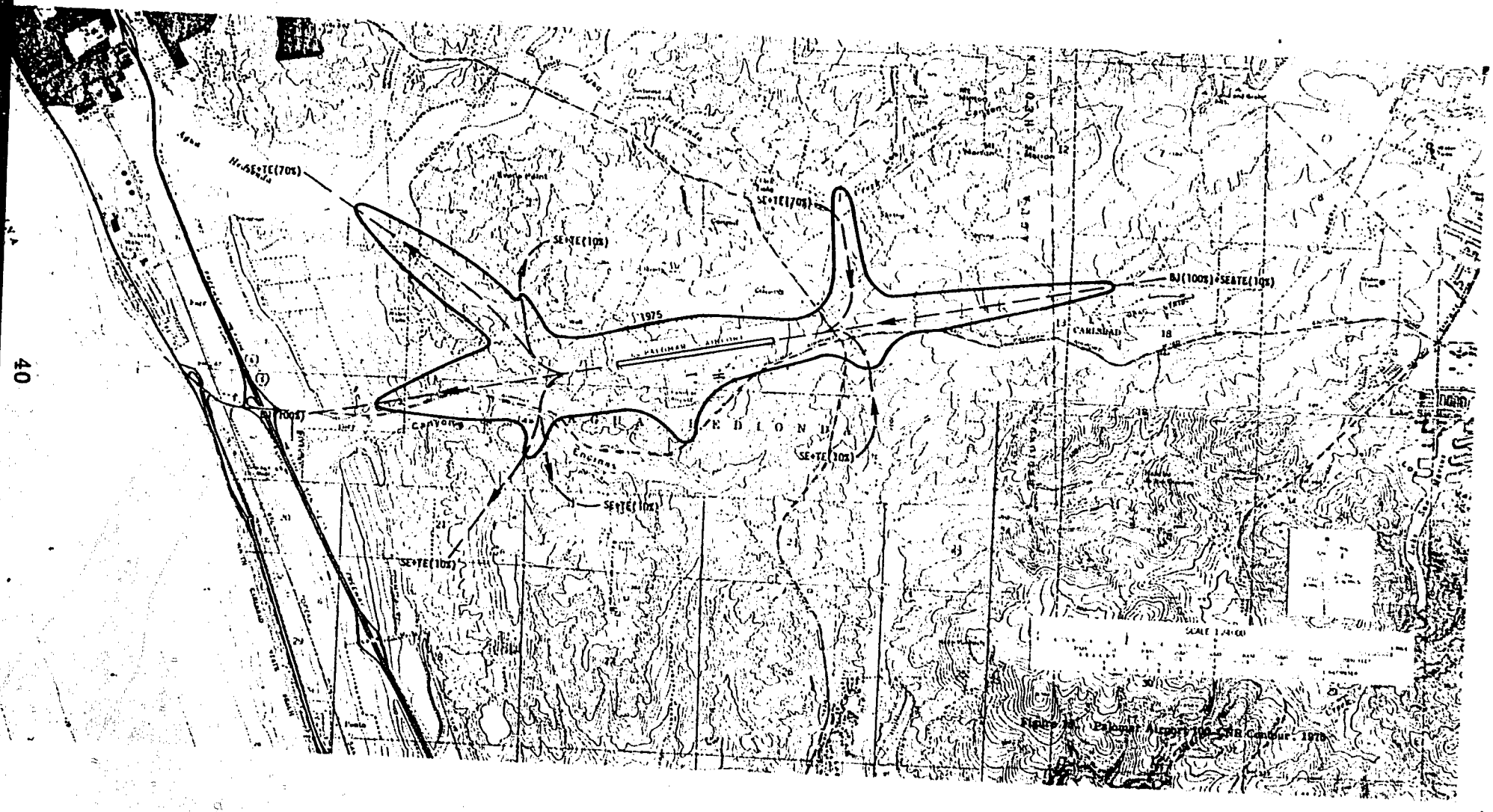


Figure 10: Palomar Airport 100 CNEL Contour - 1975

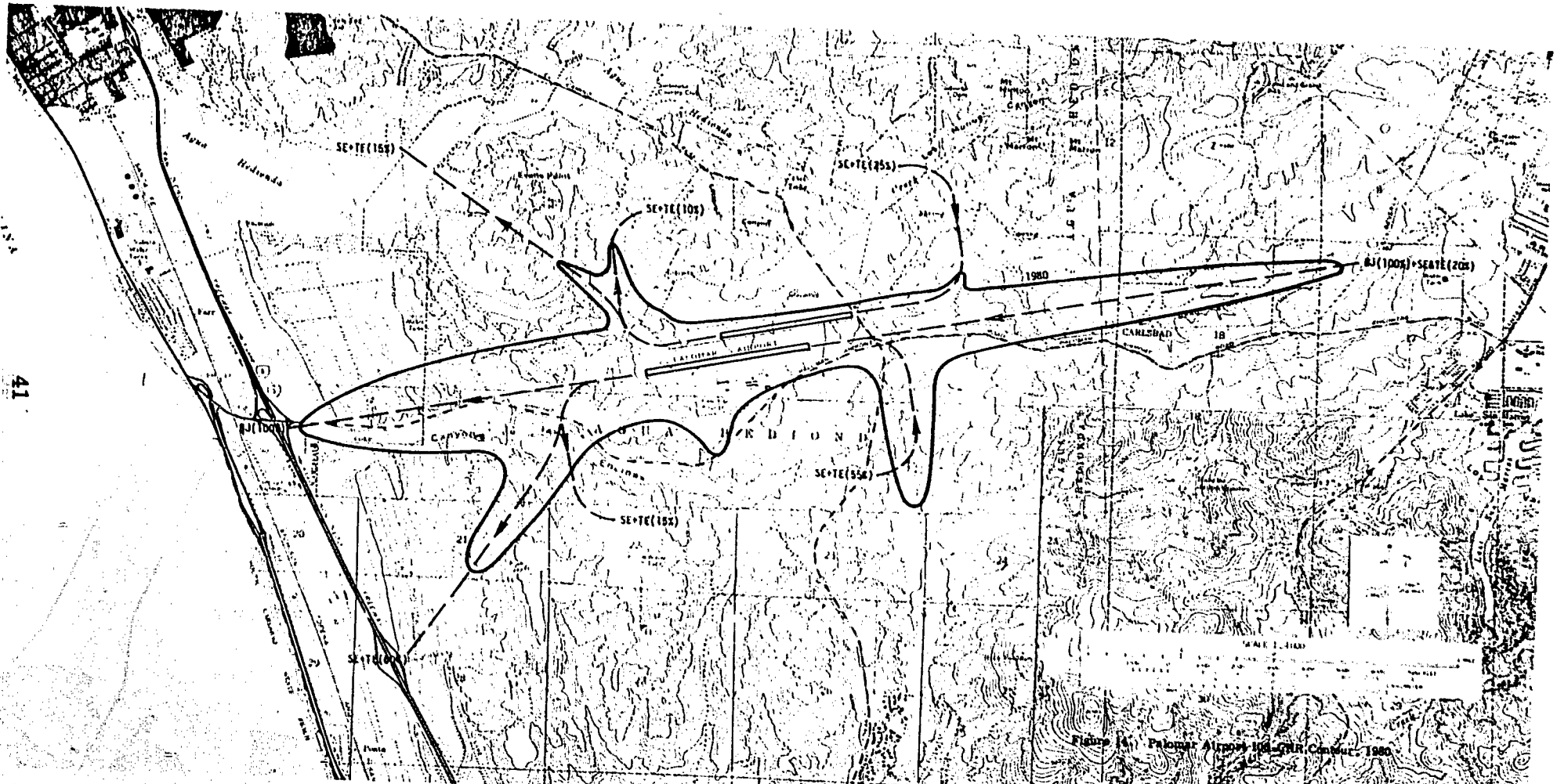


Figure 14: Palomar Airport 1984 CNEL Contour: 1980

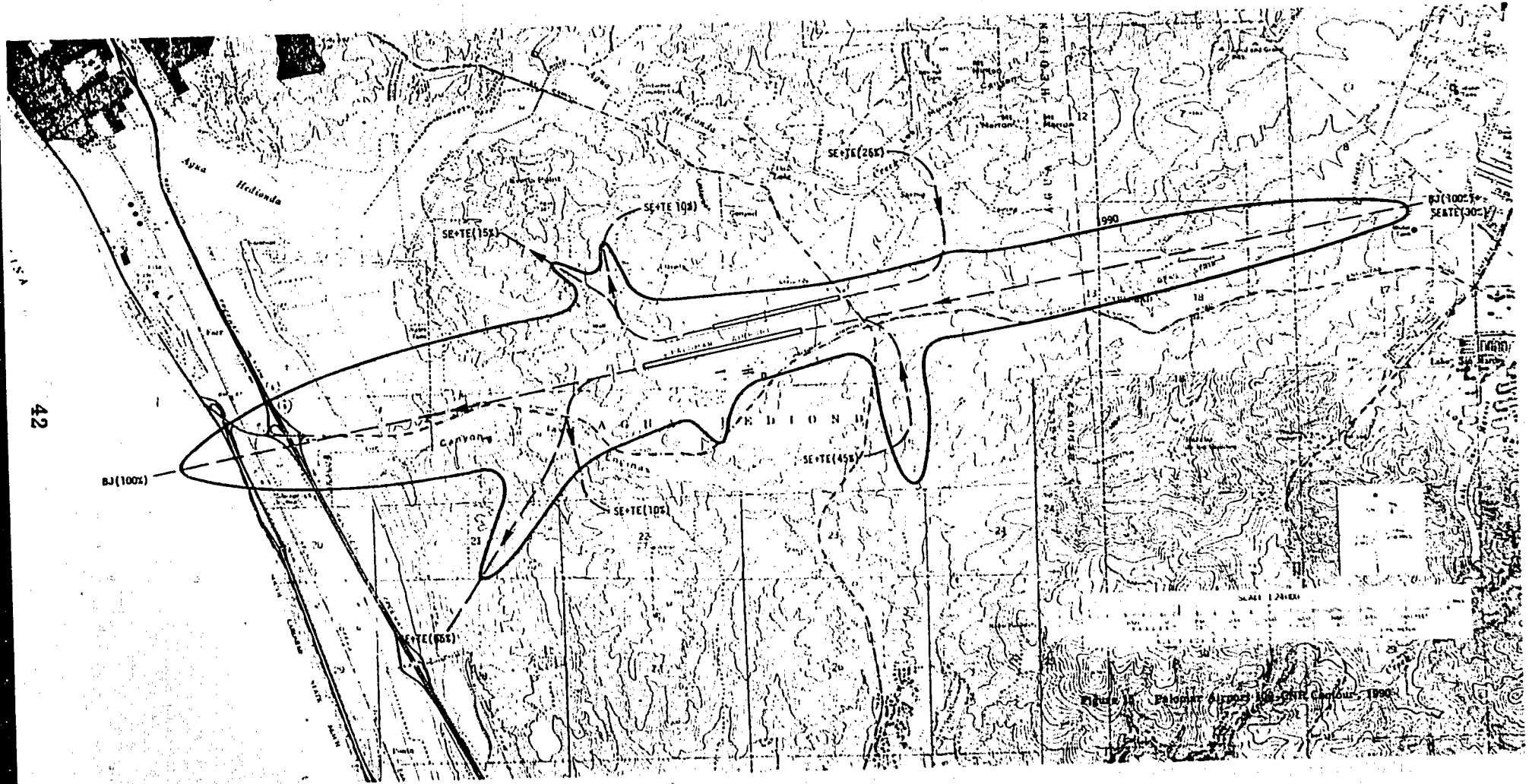


Figure 11 Palomar Airport 1990 CNEL Contours, 1990

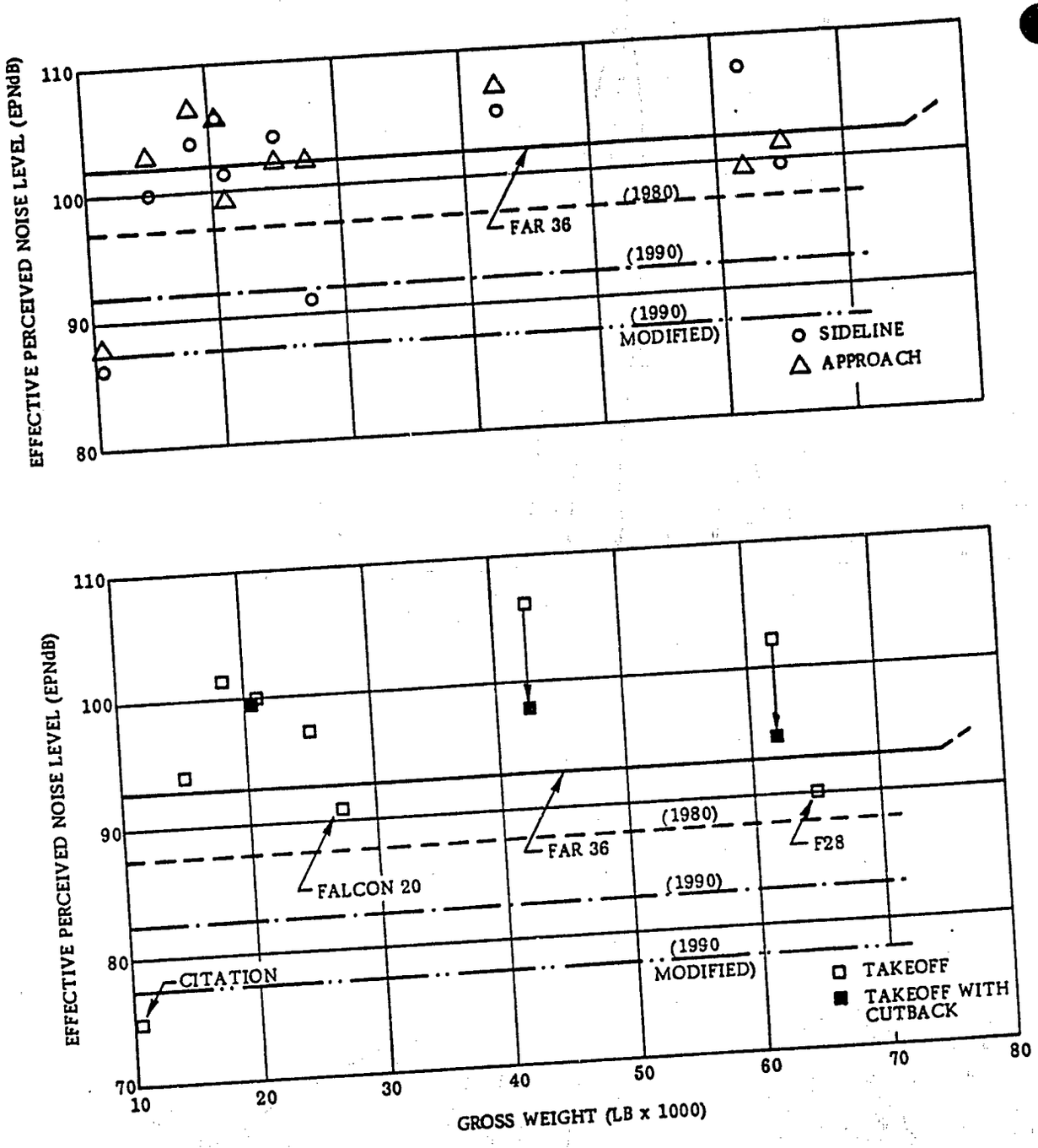


Figure 16. Current Business Jet Noise Levels

Table XVIII. Assumptions Used in Noise Contour Computations

Year	Propeller Aircraft	Jet Aircraft
1975	No Noise Reduction	No Noise Reduction
1980	No Noise Reduction	5-dB Noise Reduction
1990	5-dB Noise Reduction	5-dB Noise Reduction

The resulting 100-CNR contour for the years 1975, 1980, and 1990, using Table XVIII, are compared with the 1973 contour and are shown in Figure 17.

Zone 3 land will be located within the airport boundaries and clear zones using aircraft noise reduction technology during all time periods up to and including 1990. Without noise reduction technology there may be areas in excess of the airport property and clear zones within Zone 3 during the 1980 to 1990 time frame.

Helicopter operations will have a small effect on airport noise, however, it is anticipated that basic helicopter noise will remain at the 1973 level, based on a relatively constant number of helicopter operations at Hughes Tool Company.

The noise from automobiles and trucks were examined to determine if significant levels are obtained from those vehicles by planned usage at Palomar Airport. Using Reference 15, the maximum peak hourly volume of aircraft related cars in the year 1990 will yield an A-weighted noise level of 71 dBA at a distance of 50 feet. This, however, assumes no decrease in noise due to advances in technology.

3.3 IMPACT ON WATER QUALITY AND DRAINAGE

The proposed development will result in increased need of water and sewage facilities which are presently inadequate at Palomar Airport. The water facilities are increased on a local improvement assessment district basis for the lands benefited. Large developments under several plans provide for increased water service capability. Sewage increases at Palomar

Figure 17: Palomar Airport 1500-CNEL Contours, 1973, 1975, 1980, and 1990 (Assuming Quieting Technology)

Airport and surrounding developments planned in the 1980-1990 timeframe will result in drastic over capacity of the present Buena trunk line. This line provides for service on a first come first serve basis. Increases of sewage capacity is handled much the same as water capacity in that larger developments under several plans provide for increased sewage capacity.

The effect of drainage is negligible for any future developments at Palomar Airport due to the natural drainage provided by the surrounding terrain. Any developments in the airport vicinity will have to provide for drainage if they will interfere with the present natural drainage.

The potentiality of contamination by gasoline and engine oil exists. Thus, it is recommended that the capability for hose-down runoff will be designed such that a holding tank will be provided with proper vapor controls to handle volatile substances.

The effect on the water table will be negligible due to the natural drainage and established water paths to the ocean.

3.4 IMPACT ON ARCHAEOLOGY

The implementation of the proposed Palomar Airport Master Plan might affect only four of the numerous archaeological sites in the Palomar Airport area. These are Sites W-128, W-310, W-521, and CE #45.

Site W-128 is of moderate significance, but is outside of project boundaries; Site CE #45 is of minor to moderate significance, but also lies outside of the project boundaries.

3.4.1 Site W-310

This site is of moderate significance. It lies within the proposed Clear Zone for the Master Plan and should not be affected since the area will not be developed.

3.4.2 Site W-521

This site is of moderate significance. It also lies within the proposed Clear Zone for the Master Plan, but should not be affected since the area will not be developed.

3.4.3 Summary

No archaeological sites will be impacted by the proposed Palomar Airport Master Plan.

3.5 IMPACT ON GEOLOGY

It is possible that some fossiliferous beds may be encountered during grading operations in the airport area. These fossiliferous beds are minimal in the airport site area.

Although some clayey paleosoil will probably be removed during construction, no real ceramic clay mining is presently being pursued on the airport site. In addition, the last claypits were abandoned in 1956 to the north of the airport property. The purer areas of clayey paleosoil lie mostly north of the airport area.

The sedimentary material in the airport area should be easily graded except for the cemented sandstone beds. These beds on the average are about one-foot thick and are probably ripable, but may require some light blasting to facilitate excavation. Grading in the Santiago Peak Volcanics will be very difficult and may require considerable blasting. Future cuts that are intended to be permanent would probably stand well at a ratio of 2:1.

The environmental impact can be summarized as follows:

a. Remnants of the clayey paleosoils will probably be removed during grading operations for airport facilities.

b. New exposures of Cretaceous beds may be created by grading operations.

c. New opportunities to examine fossils from existing subsurface strata may be created during grading operations.

Section 4
ADVERSE ENVIRONMENTAL EFFECTS

The proposed development of Palomar Airport has been reviewed in terms of its affect on the environment. The primary areas of concern are:

a. Air quality.
b. Water quality and drainage.
c. Noise.
d. Wildlife.
e. Traffic.
f. Historical studies.

The air quality is primarily affected by emissions from aircraft and automobiles. The development of Palomar Airport will result in both additional aircraft traffic and automobile traffic. This traffic will result in an overall increase in air contaminant emissions in that area. It should be noted that the computation of emissions listed in Table XVII assumed that emission controls were used on automobiles at least to 1975 levels, but not on general aviation aircraft.

Any fixed based operator emissions will be negligible. Any additional tenants may be regulated by establishing emission guidelines for prospective tenants.

The impact on water quality and sewage will be appreciable to the present inadequate systems. Present and future airport expansion requires extensive water and sewage facilities expansion to the airport itself. Palomar Airport should be considered when evaluating the cost of future airport expansion and the need of water and sewage facilities.

The impact on drainage will be insignificant for the Palomar Airport expansion but serious consideration should be given to airport fuel run-off

holding tanks and the effect on natural drainage with any development adjacent to the airport boundaries that may interfere with the natural drainage.

There will be no impact on archeological sites adjacent to Palomar Airport.

There will be no major impact on flora and fauna since no rare or endangered species are present and the land has previously and presently been used for agriculture.

There will be no major impact on geology.

The major impact of traffic flow is eventual congestion and increase in noise level. The present access modification (1974) is sufficient for the present time. With airport expansion, care should be exercised in choosing access road sites to the south and north of the airport property, based on noise levels and congestion criteria. The traffic noise level will be negligible in the airport vicinity compared to the overall aircraft noise. There may be some influence to surrounding developments that are allowed to be built too near Palomar Airport Road and El Camino Real.

The aircraft noise problem will increase at Palomar Airport as shown by the 100-CNR contours in Figures 13, 14, and 15. This growth is the result of increased number of aircraft in both day and nighttime periods. This growth assumes no noise reduction application to the aircraft. Be sure to note the noise contours (Figure 17) using presently applicable noise reduction technology.

As the airfield develops it is necessary to consider the noise from two points of view. First, the aircraft operations create a noise environment which must be considered when buildings are being designed and built to ensure that occupants are not subjected to noise levels which make office conversation difficult. Secondly, it is desirable to have occupants whose operational noise levels are at least 3 dB below aircraft operations so that

the overall noise environment is not raised above that caused by aircraft. Thus, it is recommended that guidelines be developed for building codes for both internal and external noise intrusion.

Section 5

MITIGATING MEASURES

Although adverse environmental effects have been noted for air quality, water quality and sewage, noise and traffic, none present difficult problems.

The air emissions due to the proposed Palomar Airport Master Plan are minimal compared to the San Diego Air Basin.

Table XIX. Comparison of Emission Tons/Day

Sources	Hydro-carbons	Parti-culates	NO_2	SO_2	CO
1990 Palomar Airport Emissions	0.83	0.21	0.86	0.05	9.30
1972 Total San Diego Emissions	281.00	59.00	165.00	36.00	1322.00
Percent	0.29	0.36	0.52	0.02	0.74

Table XIX compares the Palomar Airport emissions in 1990, based on 1975 emission standards with the latest available (1972) San Diego Air Basin emissions. It is interesting to note that the Palomar Airport emissions in 1990 are on the order of 0.1 to 0.7 percent of the 1972 San Diego air emissions. The Palomar Airport emissions will contribute just a minimal part of the total air basin emissions. As the emission standards theoretically reduce the air basin emissions, the growth within the basin will tend to hold the overall emissions near the 1972 levels used in the percentage computations. To further reduce the impact, alternate surface transportation modes should be examined.

The water quality and sewage problem must be considered at the present time and adequate plans made for future airport expansion. Present water and sewage facility costs must be borne by the airport or the county at this

time. Future water and sewage expansion will become less difficult as new developments in the airport vicinity are undertaken and water and sewage are provided for these developments. The City of Carlsbad, San Diego County, and developers could bear this additional cost.

The growth of airport operations presents a significant noise problem as shown in Figures 13, 14, and 15. However, it is technically feasible to evaluate the noise based on aircraft noise quality technology which was the basis of Table XVIII. From Figure 17 it is obvious that with the noise reduction technology applied to the aircraft, the 1980 and 1990 100-CNR contours individually encompass less land area than the 1973 100-CNR contour.

Geologists and paleontologists should be informed of grading operations involving the Point Loma formation so that interested parties may make inspections and record their findings for future use. In addition, paleontological and geological sites uncovered during grading operations and termed significant by inspecting geologists or paleontologists should be left exposed for a reasonable amount of time until fossil collection and appropriate investigation are accomplished.

Section 6
ALTERNATIVES TO THE PROPOSED ACTION

The primary environmental impacts associated with the development of Palomar Airport include added air contaminants due both to the automobiles and aircraft, biotic disruption, and potential noise problems if business jets are not limited as to permissible noise levels. This section will discuss alternatives capable of substantially reducing or eliminating the adverse impacts.

The first alternative is to not proceed with the proposed development. This alternative leads to certain projected consequences. If general aviation services are not upgraded it is expected that the practical annual capacity will be exceeded. Thus, aircraft operations could grow to a level and then must level off. After this time, assuming aircraft demand continues to grow, the excess operations must be transferred to other airports within the region.

Due to its location, Palomar Airport is presently the most able of all county airports to control its environmental impact upon its surrounding communities. This is a result of its location and the fact that present development is minimal in the surrounding area. If the airport were moved then the following facts must be considered: 1) the aircraft will operate somewhere in the San Diego Air Basin and 2) the extended trip length for North County cars to drive to other San Diego County airports would further increase auto emissions in the San Diego Air Basin since the basic emission quantities are a function of trip length.

From the standpoint of noise impact, Palomar Airport could provide for the present planned expansion but could be closed to business jet aircraft. This would reduce the noise levels about Palomar Airport since the business jets will control the noise contour locations. However, as in the first

alternative, the business jets will land elsewhere in the county creating the same air emission increases in the air basin. The noise problem will then be shifted to another airport, thus creating a similar noise problem in the county.

Another alternative is the utilization of alternate modes of surface transportation. These include all modes of transporation: buses, rapid transit, people movers, etc. The primary environmental improvement again would occur in the area of air quality, the net result falling somewhere between the full development and no project case discussed above.

Section 7

RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

The cumulative and long-term effects of the proposed project which affect the state of the environment are primarily those associated with air quality. The short-term uses will be those associated with construction on the site. These secondary impacts include dust, noise, displacement of animals and plants, and disruption of traffic flow within the area. Such short-term uses will, however, be mitigated by restoration of the area environment when construction is finished.

Section 8
IRREVERSIBLE ENVIRONMENTAL CHANGES

The use of nonrenewable resources during the initial and continuing phase of a project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely. These include animal, vegetable, and mineral resources. Since the project area is partially developed, any major commitment of local resources has been made. The likelihood of irreversible damage is quite small.

Section 9

GROWTH-INDUCING IMPACT OF THE PROPOSED ACTION

The growth-inducing impact of the Palomar Airport development is based upon the projected demand of the growing population for increased general aviation activities. Thus, if the airport is to keep pace with the demand and remain an economically viable operation, some local growth is mandatory. The project, as presently conceived, will result in more fixed-base operators. Thus, the need for local services such as sewage, phone, and electrical service will grow.

Section 10
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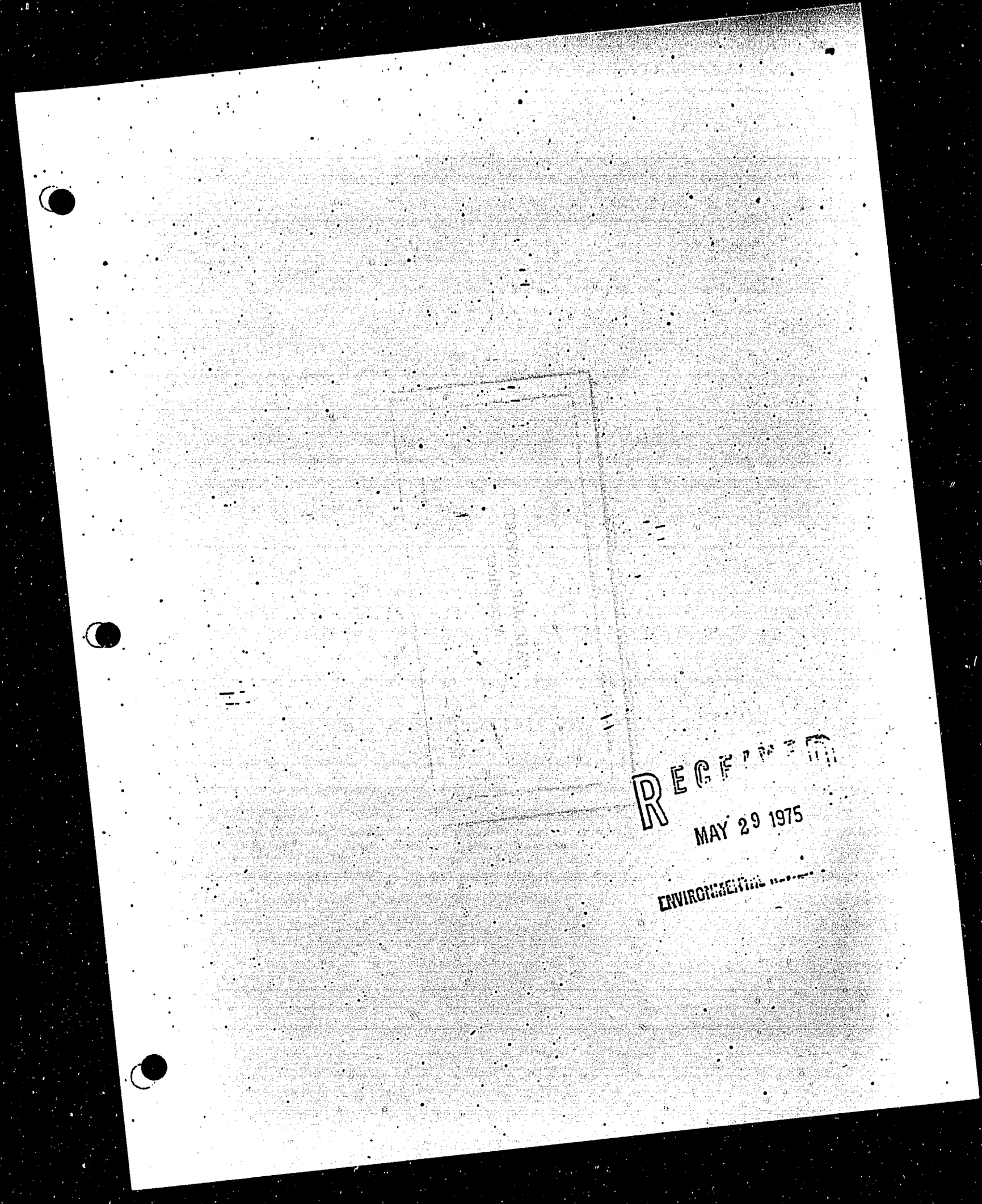
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PALOMAR AIRPORT
Appendices

APPENDIX I

ACCESS PLAN

PALOMAR AIRPORT ACCESS STUDY

Prepared For

WILLIAM L. PEREIRA ASSOCIATES

BY

WILBUR SMITH & ASSOCIATES

January 1975

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Chapter 1

INTRODUCTION

Palomar Airport is a general aviation facility located in the northwestern portion of San Diego County approximately 4 miles southeast of the City of Carlsbad and 27 miles north of the City of San Diego. Figure 1 depicts the regional location of Palomar Field along with other aviation facilities within the regional boundaries described in Figure 1.

Locally, Palomar Airport is situated approximately 3 miles east of the interchange of Interstate Route 5 (I-5) with San Diego County Route S-12 (Palomar Airport Road). The airport property lies primarily northwest of and adjacent to the intersection of San Diego County routes S-11 (El Camino Real) and S-12 (Palomar Airport Road).

The North County region of San Diego County is one of the most rapidly growing areas in California. Based upon its geographic location between two expanding metropolitan centers, Los Angeles and San Diego, its pleasant climate and scenic topography, San Diego's North County growth is projected to accelerate for many years to come. Correspondingly, the demand for general aviation is projected to parallel the forecasted growth of the region.

Authority and Purpose of the Study

The County of San Diego has retained the firm of William L. Pereira Associates to develop the Master Plan for the expansion of general aviation facilities at Palomar Airport. The airside and

REGIONAL LOCATION MAP – PALOMAR AIRPORT

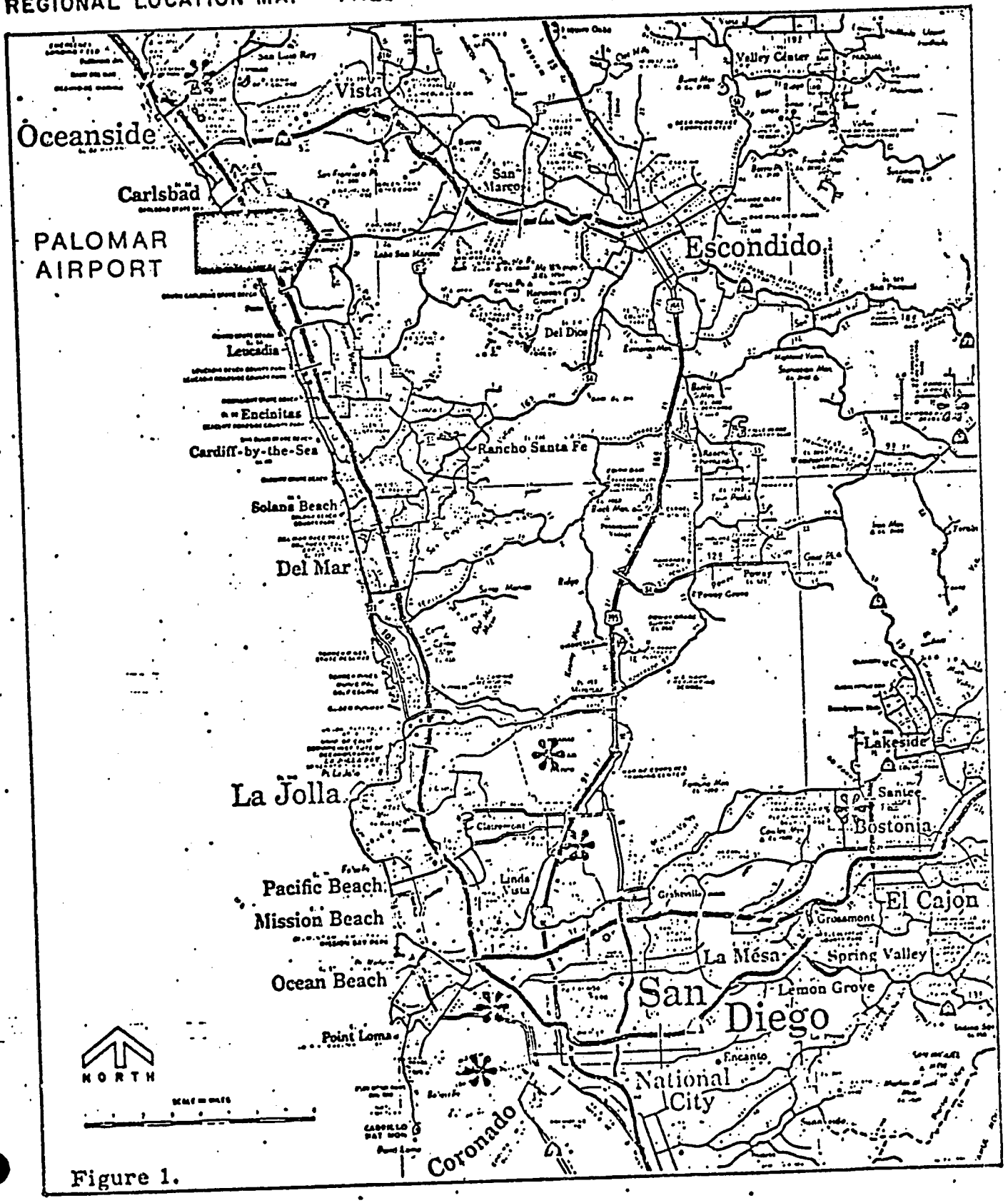

Figure 1.

ground access improvements are to be designed to accommodate a projected 613 based aircraft and an associated 402,000 annual operations in the year 1990.

This traffic and access study has been authorized by William L. Pereira Associates for the County of San Diego to develop future circulation, parking, and access improvements for integration with the development and expansion plans being prepared by the project architect.

The purpose of the study, therefore, was to develop a recommended access plan based upon general aviation demand forecasts for the year 1990, upon a broad data base of existing traffic volume and operational parameters gathered specifically for Palomar Airport by Wilbur Smith & Associates, and upon relationships between general aviation activity and ground travel activity developed by Wilbur Smith & Associates from previous studies of similar general aviation facilities in San Diego County and other areas.

Study Approach and Work Program

The ground transportation planning program for Palomar Airport was organized into two phases of analysis. The first phase identifies the transportation system requirements of the airport including the existing and projected airport population components and travel parameters. The second phase involved the development of a ground access, parking, and circulation plan to satisfy the projected 1990 general aviation activity demand forecast.

The work program utilized, extended, amplified, and organized the preceding objectives and study approach into a series of work tasks. The basic steps of the work program were as follows:

1. Inventory of existing conditions including analysis of previous studies, access, circulation, and parking characteristics;

2. Development of Airport Requirements and Planning Criteria;

3. Projection of future ground travel activity from general aviation activity demand forecasts; and

4. Development of a Recommended Access Plan.

Recommended Access Plan

The recommended access plan has been developed utilizing existing travel characteristics and a projected general aviation demand of 613 based aircraft and approximately 402,000 annual operations in 1990.

The ground transportation system will adequately accommodate the projected ground travel activity at Palomar Field. The recommended plan compliments the proposed airside expansion plans and provides for improved traffic, parking, and circulation activity in the Palomar Airport area.

The site plans for the Palomar Airport complex, as for other projects of this magnitude, are necessarily subject to continued refinement. The impact of these refinements on access and parking requirements may be appraised from the data set forth in this report.

Chapter 2

PRESENT TRAFFIC CONDITIONS

Palomar Airport is served by one major Interstate route and two major county routes which provide reasonably good accessibility to the site.

Existing Roadways

The local access network serving Palomar Airport is depicted in Figure 2, while a description of the major roadways follows:

Interstate Route 5 (I-5) - Interstate Route 5 is a major north-south multi-lane freeway facility providing regional access to Palomar Airport via an interchange with Palomar Airport Road (San Diego County Route S-12) approximately 3 miles west of the airport. Airport users from along the coastal corridor would utilize I-5 for immediate access to Palomar Airport Road and Palomar Field.

El Camino Real (San Diego County S-11) - El Camino Real is a five lane (four lanes plus left turn pockets) north-south roadway which roughly parallels Interstate Route 5, approximately 1 to 3 miles easterly, between Encinitas and San Luis Rey. As a result this facility offers an alternate north-south approach to Palomar Field to that provided by Interstate 5. Airport users favoring more leisurely travel on a less heavily traveled and lower speed facility would likely approach Palomar Field on El Camino Real rather than on I-5. El Camino Real interchanges approximately 5 miles north of the airport with State Route 78, which connects I-5 near Carlsbad with the communities of Vista, San Marcos, and Escondido.

LOCAL ACCESS NETWORK – PALOMAR AIRPORT

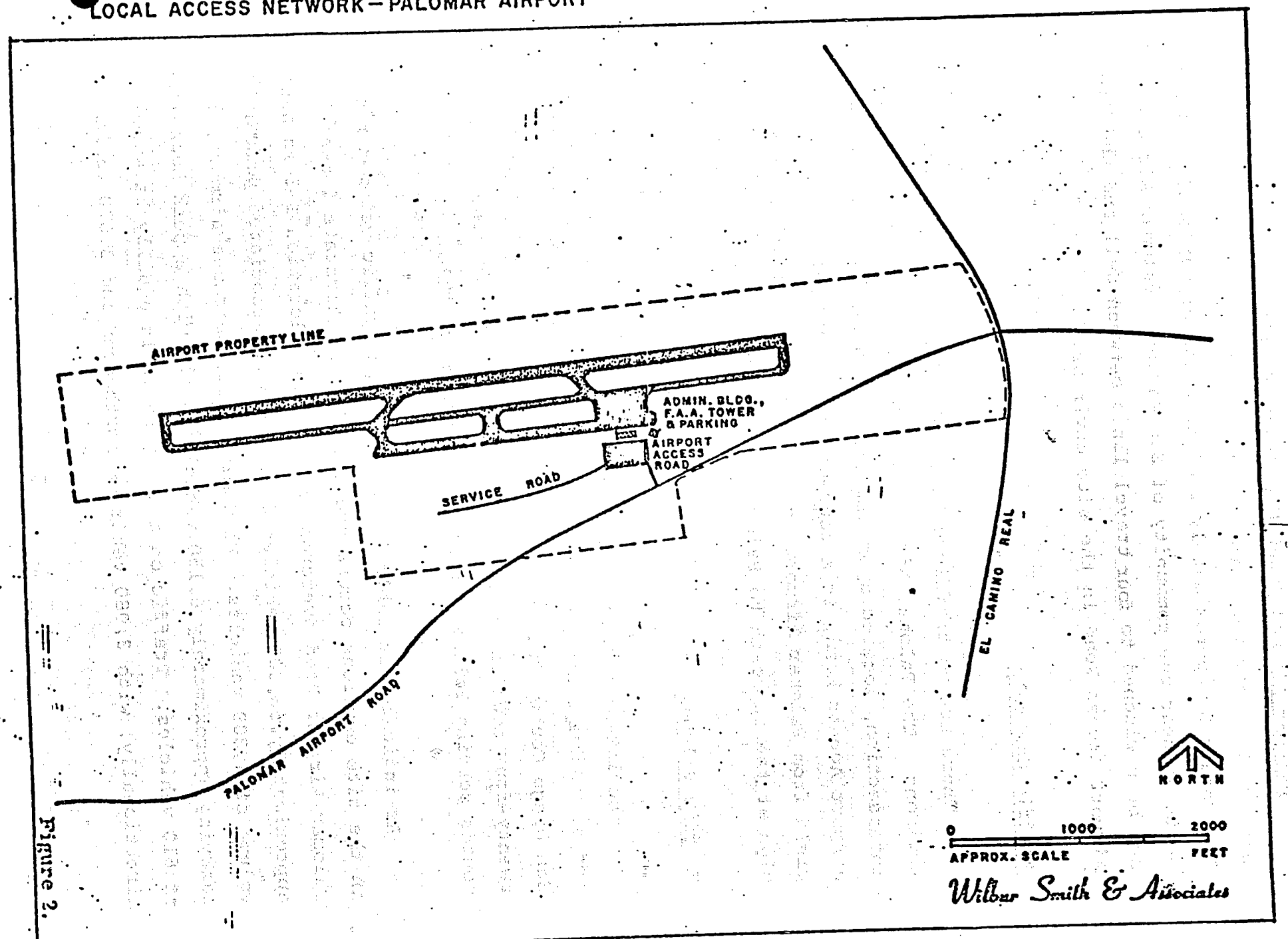

Figure 2

Palomar Airport Road (San Diego County Route S-12) - This east-west county route is primarily a two-lane roadway connecting Interstate 5, approximately 2 miles south of Carlsbad, and State Route 78 near the community of San Marcos. Palomar Airport Road has been widened to four travel lanes between S-11 and the Palomar Airport Access Road in the site environs.

Traffic Controls

There are no traffic signalized intersections within the site environs. The Palomar Airport Road (S-12) and El Camino Real intersection, located approximately 2,500 feet east of the Palomar Airport Access Road, is a four-way stop. Vehicles exiting Palomar Field from Palomar Airport Access Road are controlled by a stop sign at the approach to Palomar Airport Road.

Traffic Volumes

The latest information regarding street traffic volumes for access roadways serving the Palomar Airport were obtained from the San Diego County Traffic Engineering Department. A summary of twenty-four hour and peak hour traffic volumes for the major access routes serving Palomar Field are presented in Table 1.

As indicated in Table 1, the heaviest traffic volumes recorded in the site environs occurs predictably on Interstate 5 near the Palomar Airport Road overcrossing. At that location I-5 is handling approximately 56,000 vehicles daily with an associated peak hour volume of 4,800 vehicles. El Camino Real, near the airport, is carrying approximately 6,150 vehicles daily with a peak hour volume of 610 vehicles. Traffic on a daily basis is equally balanced directionally, with 3,080 vehicles northbound and 3,070 vehicles

Table 1

EXISTING TWENTY-FOUR HOUR/PEAK HOUR TRAFFIC VOLUMES

Palomar Airport Access Roadways

ROADWAY	LOCATION	NUMBER OF LANES	24-HR. VOLUME	PEAK HOUR VOLUME
Interstate Route 5	Palomar Airport Road	8	56,000	4,800
El Camino Real (S-11)	S/O Palomar Airport Road	4	6,150	610
Palomar Airport Road (S-12)	E/O Palomar Airport Access Road	4	3,600	400
	W/O Palomar Airport Access Road	2	3,460	375

southbound on an average day. Palomar Airport Road, west of El Camino Real, is handling 3,600 vehicles and 3,460 vehicles daily east and west of the Palomar Airport Access Road, respectively. Peak evening hour traffic volumes at these locations are 400 and 375 vehicles, respectively.

Since traffic volumes internally at Palomar Field were not available from County of San Diego agencies, Wilbur Smith and Associates conducted supplementary field traffic counts during April 1973 to complete the necessary traffic volume data base. Twenty-four hour traffic volume counts were conducted on the Palomar Airport Access Road slightly north of Palomar Airport Road between Wednesday, April 25, 1973 and Sunday, April 29, 1973. The results of that extensive hourly traffic count are shown in Table 2. As indicated, traffic volumes (total both directions) varied from a low of 632 vehicles daily on April 27, 1973 to a

Table 2

TWENTY-FOUR HOUR TRAFFIC VOLUMES

Palomar Airport Access Road
(4/25/73-4/29/73)

HOUR ENDING	4/25/73 WEDNESDAY	4/26/73 THURSDAY	4/27/73 FRIDAY	4/28/73 SATURDAY	4/29/73 SUNDAY
1:00 A.M.		0	0	2	(2)
2:00 A.M.		0	1	1	0
3:00 A.M.		1	0	0	0
4:00 A.M.		0	0	0	2
5:00 A.M.		1	1	1	0
6:00 A.M.		4	5	0	0
7:00 A.M.	334 (1)	29	27	15	11
8:00 A.M.		41	34	38	27
9:00 A.M.		37	29	40	26
10:00 A.M		51	42	37	35
:00 A.M.		48	31	56	48
on		53	35	55	38
1:00 P.M.		45	51	55	82
2:00 P.M.	56	31	49	57	81
3:00 P.M.	67	52	72 (3)	62 (3)	92 (3)
4:00 P.M.	81 (3)	77 (3)	67	48	92 (3)
5:00 P.M.	73	58	53	58	86
6:00 P.M.	56	33	46	58	67
7:00 P.M.	50	30	30	44	
8:00 P.M.	22	25	16	22	
9:00 P.M.	13	12	17	14	124 (1)
10:00 P.M.	8	22	14	13	
11:00 P.M.	7	20	10	6	
Midnight	5	6	2	6	
TOTALS	772	676	632	688	811

(1) Estimated
(2) Change from Pacific Standard Time to Pacific Daylight Time.
(3) Peak Hour

a high of 811 vehicles daily on Sunday, April 29, 1973. The highest hourly traffic volume recorded for the five-day period was 92 vehicles between 3:00-4:00 P.M. on a Sunday. As indicated, the period between noon and 5 P.M. on Sunday recorded the highest sustained hourly traffic volumes, as 433 vehicles (total both directions) traveled this roadway section during those hours.

The results of a directional traffic count conducted on the Palomar Airport Access Road between 1:00 P.M. Wednesday, April 25, 1973 and 1:00 P.M. Thursday, April 26, 1973 are shown in Table 3. As indicated, traffic volumes directionally for this twenty-four hour period are nearly balanced with 358 vehicles and 390 vehicles recorded inbound and outbound, respectively. The heaviest flux of vehicles outbound occurred between 3:00 and 6:00 P.M. with 38 per cent of all outbound movements occurring during those three traffic hours. These same three traffic hours were the highest volume hours for total traffic movement at this location, accounting for nearly 30 per cent of daily vehicular activity.

Table 4 summarizes a twenty-four hour traffic count conducted at the aircraft taxiway crossing on the Palomar Airport Service Road. As shown in Table 4, 459 vehicles (total both directions) were recorded between 2:00 P.M. Thursday, April 26, 1973 and 2:00 P.M. Friday April 27, 1973. This corresponds to a 24 hour traffic volume of 640 vehicles on the Palomar Airport Access Road during the same time interval. Twenty per cent of daily traffic volume at this location occurred during the two highest traffic hours, 4-6 P.M.

Traffic Growth

Traffic growth on the two major county routes within the study area during the period between 1970 and 1974 has progressed at a

Table 3

TWENTY-FOUR HOUR DIRECTIONAL TRAFFIC VOLUMES

Palomar Airport Access Road

(4/25/73 - 4/26/73)

HOUR ENDING	INBOUND		OUTBOUND		TOTAL	
	Volume	Percent (1)	Volume	Percent (1)	Volume	Percent
2:00 P.M.	21	5.9	35	9.0	56	7.5
3:00 P.M.	40 (2)	11.2	27	6.9	67	9.0
4:00 P.M.	29	8.1	52 (2)	13.3	81 (2)	10.8
5:00 P.M.	24	6.7	49	12.6	73	9.8
6:00 P.M.	9	2.5	47	12.1	56	7.5
7:00 P.M.	18	5.0	32	8.2	50	6.7
8:00 P.M.	11	3.1	11	2.8	22	2.9
9:00 P.M.	7	2.0	6	1.6	13	1.7
10:00 P.M.	4	1.1	4	1.0	8	1.1
11:00 P.M.	3	.8	4	1.0	7	1.0
Midnight	2	.6	3	.8	5	.7
1:00 A.M.	0	0.0	0	0.0	0	0.0
2:00 A.M.	0	0.0	0	0.0	0	0.0
3:00 A.M.	1	.3	0	0.0	1	.1
4:00 A.M.	0	0.0	0	0.0	0	0.0
5:00 A.M.	1	.3	0	0.0	1	.1
6:00 A.M.	4	1.1	0	0.0	4	.5
7:00 A.M.	27	7.5	2	.5	29	3.9
8:00 A.M.	39	10.9	2	.5	41	5.5
9:00 A.M.	22	6.1	15	3.8	37	4.9
10:00 A.M.	33	9.2	18	4.6	51	6.8
11:00 A.M.	25	7.0	23	5.9	48	6.4
Noon	16	4.5	37	9.5	53	7.1
1:00 P.M.	22	6.1	23	5.9	45	6.0
TOTALS	358	100.0	390	100.0	748	100.0

(1) Hourly Percent of 24 Hour Total
(2) Peak Hour

Table 4

TWENTY-FOUR HOUR TRAFFIC VOLUMES
Palomar Airport Service Road (1)

HOUR ENDING	VEHICLE VOLUME	
3:00 P.M.	24	Thursday, 4/26/73
4:00 P.M.	46	Peak Hour
5:00 P.M.	43	
6:00 P.M.	26	
7:00 P.M.	34	
8:00 P.M.	30	
9:00 P.M.	5	
10:00 P.M.	20	
11:00 P.M.	19	
Midnight	1	
1:00 A.M	0	Friday, 4/27/73
2:00 A.M.	1	
3:00 A.M.	0	
4:00 A.M.	0	
5:00 A.M.	5	
6:00 A.M.	1	
7:00 A M.	27	
8:00 A.M.	19	
9:00 A.M.	20	
10:00 A.M.	18	
11:00 A.M.	20	
Noon	33	
1:00 P.M.	36	
2:00 P.M.	31	
TOTAL	459 (2)	

(1) At Aircraft Taxiway Crossing.

(2) Corresponds with a 24 hour total of 640 vehicles on the airport access road during the same time interval.

rapid rate. Table 5 depicts traffic volumes on I-5, El Camino Real, and Palomar Airport Road, for the years 1970, 1972, and 1974. As indicated, El Camino Real traffic volumes have increased from 1,830 to 6,150 vehicles daily between 1970 and 1974. This represents an average annual increase of nearly sixty (60) per cent. However, between 1973 and 1974 the annual growth rate subsided to eleven (11) per cent.

Palomar Airport Road traffic volumes increased from 2,490 daily vehicles in 1970 to 3,460 daily vehicles in 1974, an average annual increase of nearly twelve (12) per cent. Similar to El Camino Real the average annual increase between 1973 and 1974 has decreased to an 8.8 per cent level.

Interstate 5 average annual daily traffic volumes have increased from 42,000 vehicles in 1970 to 56,000 vehicles in 1974. This represents an average annual increase of eight (8) per cent. However, no percentage increase occurred between 1973 and 1974, a condition attributed to the energy crisis.

Table 5

TRAFFIC GROWTH

Palomar Airport Access Roadways

ROUTE	1970 ADT	1972 ADT	1974 ADT	PER CENT GROWTH 1970-1974
I-5 (S/O Palomar Airport Road Overcrossing)	42,000	50,000	56,000	33
El Camino Real	1,830	3,370	6,150	236
Palomar Airport Road	2,490	2,780	3,460	47

Volume/Capacity Comparison

Before it is possible to determine whether the existing street network serving the proposed site will be able to accommodate the additional traffic generated by the expanded Palomar Airport complex, the ability of the street system to accommodate existing traffic must be measured. Traffic capacity is a term which expresses the ability of a roadway to carry traffic. On a city street the intersection is the largest single factor that reduces street traffic capacity. The principle factors that tend to reduce traffic flow at intersections are: 1) traffic signals, 2) turning movements, 3) pedestrians, 4) parked vehicles, 5) slow-moving commercial vehicles, and 6) pavement or intersection geometric conditions.

The type of traffic flow associated with a given section of the roadway can be classified by the "level of service" ranking.(1) Level of service classifications range over six categories, A through F. A represents a high level of service, free uninterruped traffic flow; while F represents the worst level of service, forced low speed traffic flow.

Level of service C is the level typically associated with urban design practice. At this level of service, stable flow, drivers may occasionally have to wait through more than one red signal indication, and backups may develop behind turning vehicles.

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(1) Highway Research Board, Highway Capacity Manual, Special Report 87, Washington, D.C., 1965, pg. 75-87.

As the peak hour volume/capacity ratio approaches 1.0, delays increase. A volume/capacity ratio greater than 1.0 signifies that the approach is operating above capacity with practically 80 per cent of all vehicles waiting through more than one cycle. Capacity analysis at an intersection is an important tool to measure the overall effectiveness of a roadway since intersection capacity governs the overall flow of traffic.

Volume/capacity comparisons were performed at two locations, Interstate Route 5 near the Palomar Airport Road interchange and at El Camino Road and Palomar Airport Road. At both locations a peak hour capacity surplus exists. At service level "C" a twenty five (25) per cent capacity surplus exists on Interstate 5. At the four way stop at El Camino Real and Palomar Airport Road, during the peak hour, present demand of approximately 1,250 vehicles per hour is significantly below the available capacity of 3,500 vehicles per hour.

Roadway Improvement Plans

Responsible personnel in the San Diego County Highway Design section and in the City of Carlsbad were contacted regarding proposed short or long range planning for Palomar Airport Road and El Camino Real in the site environs. According to San Diego County Engineering Department sources, there are no further improvements planned for El Camino Real or Palomar Airport Road, in the vicinity of the site within the existing six-year capital improvement program. Three years ago the County improved El Camino Real to a four lane divided roadway with left turn pockets at Palomar Airport Road.

Officials in the Engineering Department of the City of Carlsbad indicate that efforts to improve Palomar Airport Road within the City continue to have funding difficulties, therefore, future plans are unclear. In the ultimate long range plan both El Camino Real and Palomar Airport Road are scheduled to be six lane median-divided roadways.

Chapter 3

PROJECTED TRAFFIC VOLUMES

In order to evaluate the impact of the expanded general aviation facilities development proposed in the 1990 Master Plan for Palomar Airport on the surrounding street and highway network, it was necessary to develop and analyze future highway traffic. Traffic volume for all the proposed developments within the Palomar Airport property were calculated and superimposed on the future highway traffic projected for the area. The adjacent street and highway network was then analyzed as to its ability to adequately handle the increased traffic.

General Aviation Demand Forecast

It has been established from airport studies at Gillespie Field and other general aviation facilities in the Southern California area that traffic generation is directly related to the number of based aircraft. Therefore, it was necessary to develop an accurate demand forecast of the number of based aircraft expected at Palomar Airport for the 1990 design year.

Table 6 is a summarization of the expected growth in both based aircraft and number of annual general aviation operations for Palomar Airport as developed by Mitchell Research Associates for this study. The trends presented are based on current activity and available demographic data reflecting the expected growth in the area.

Table 6

PROJECTED GENERAL AVIATION DEMAND

Palomar Airport

YEAR	NUMBER OF BASED AIRCRAFT	NUMBER OF ANNUAL OPERATIONS
1973	191.	201,000
1975	207.	232,000
1980	290.	259,000
1990	613.	402,000

SOURCE: Mitchell Research Associates

As indicated in Table 6, during 1973 Palomar Airport had approximately 191 based aircraft, including helicopters operating at the Hughes installation, with an associated 201,000 annual operations. It is projected that by 1990 there will be 613 based aircraft with an associated 402,000 annual operations at Palomar Airport.

General Aviation Trip Generation Rates

Based on detailed traffic and employment data collected at Palomar Airport, an analysis was conducted to establish a meaningful correlation between vehicle traffic generation and itinerant and local general aviation operations. The purpose of this correlation analysis was to establish a suitable equation for determining vehicle traffic generation as a function of the type and number of aircraft operations. A number of models were investigated, however, none were found suitable to predict the observed vehicle

traffic with any degree of accuracy. Therefore, it was concluded another technique must be developed for generating general aviation related vehicle traffic.

The method devised established a traffic generation rate developed from based aircraft and vehicular volume data observed at Palomar Airport and other general aviation fields. After analysis relative to the aircraft operations and observed maximum general aviation related traffic, it was concluded that a typical aircraft operational Sunday in July or August would generate 1,000 vehicle trips for the approximately 200 aircraft located at Palomar Airport. This corresponds to a generation rate of 5.0 vehicle trips per based aircraft. Furthermore, the total number of vehicle trips (1,000) corresponds to a quantity approximately 25 per cent higher than that observed during a 5-day period in April 1973 at Palomar Airport.

Traffic Distribution

The distribution of traffic from the airport property to the surrounding roadway network was developed based upon an analysis of the areal location of based aircraft owner residences for 1990, derived for this study by Mitchell Research Associates. This analysis stipulated the number of private party based aircraft and the associated community residence of the aircraft owners. It has been projected that 402 of the total 613 based aircraft in 1990 will have private party ownership within San Diego County. An additional 31 based aircraft, or approximately 5 per cent, will have owners who reside outside of San Diego County. The remainder of the 613 based aircraft are composed of 149 Fixed Based Operators and 31 helicopters.

Based upon this geographical owner distribution data base, traffic was assigned to the individual roadways assuming motorists would seek the shortest, most convenient route to and from Palomar Airport from their residence location. The estimated directional distribution derived from this analysis is shown in Table 7.

Table 7

ESTIMATED APPROACH DISTRIBUTION - 1990

Palomar Field

APPROACH ROUTE	PER CENT OF TOTAL
El Camino Real (Southbound) (North of Palomar Airport Road)	20
El Camino Real (Northbound) (South of Palomar Airport Road)	6
Palomar Airport Road (Eastbound) (West of Airport Access Road)	33
Palomar Airport (Westbound) (East of El Camino Real)	41
TOTAL	100

As shown in Table 7, approximately 41 per cent of general aviation related trips would approach Palomar Airport from the east on Palomar Airport Road, east of El Camino Real. This occurs because of a heavy concentration of origins in Escondido and San Marcos. Approximately 33 per cent of expected general aviation related traffic is projected to approach Palomar Airport from the west, an additional 20 per cent from the north, while only 6 per cent is anticipated to approach from the south.

Projected Land Use

Palomar Airport is a general aviation airport which in 1973 reported 191 based aircraft and 201,000 annual operations. Existing aviation related facilities on airport property consists of the airport administration-terminal building and F.A.A. control tower facilities. Additionally, there are several Fixed Base Operators located south and west of the terminal area. A complete array of general aviation support services are provided on site including sales, rental, charter service, flight school, maintenance, fuel, and a cafe. Located at the extreme western end of the property is the Hughes Helicopter Test Facility.

The proposed 1990 Master Plan for Palomar Airport calls for significant development in general aviation facilities to handle a projected 613 based aircraft, more than three times the existing level. In order to accommodate the anticipated growth in based aircraft and annual operations, a new area, located north of the proposed second runway, will be developed with Fixed Base Operations. Other significant land use changes would involve the development of a recreational/buffer zone and an industrial/commercial sector, as shown in the Ultimate Land Use Plan.

Background Traffic Development

Future highway traffic in the site environs is comprised of aviation and non-aviation traffic generated by Palomar Airport, as well as background traffic generated by adjacent land uses within the influence sphere of the airport. Wilbur Smith and Associates contacted several planning agencies to obtain the most factual available future projected traffic assignments to site access roadways. The traffic study selected for use in the airport access analysis was conducted

in 1972 by San Diego County. This study developed future traffic volume assignments to site access roadways based upon the adopted 1967 San Dieguito Community Plan assuming saturated conditions. The projected 1990 traffic volume assignments from this study for site access roadways are summarized in Table 8 .

Table 8

1990 TRAFFIC VOLUME PROJECTIONS

Palomar Airport Access Roadways

ROADWAY	LOCATION	1990 PROJECTED TRAFFIC (ADT)
El Camino Real	N/O Palomar Airport Rd.	41,000
El Camino Real	S/O Palomar Airport Rd.	40,000
Palomar Airport Rd.	W/O El Camino Real	6,000
Palomar Airport Rd.	S/O El Camino Real	54,000

Source: San Diego County Engineering Study, 1972

The scope of work for this airport access study did not include the development and application of a 1990 traffic volume assignment study for external airport land uses within the Palomar Airport influence sphere. Therefore, it was necessary to utilize this historical study for background traffic assignments. However, it is important to note this San Diego County Study has certain limitations and weaknesses.

Because the northern boundary of this traffic study was Palomar Airport Road, the contribution from land uses north of this roadway were not adequately considered in developing traffic volume projections. Additionally, a new land use plan, with significantly higher land use densities, has recently been adopted for this region. These considerations, in addition to

pending industrial park development in the site environs totaling approximately 1,000 acres, suggest a re-evaluation of projected areal traffic volumes is needed. Therefore, it is recommended that a comprehensive traffic volume projection study be initiated jointly by San Diego County and the City of Carlsbad, which will generate assignments to existing roadways in this expanding North County area, which reflect recent land use intensity philosophies.

1990 Daily Traffic Generation

The trip generation rate for fixed base operations was developed from empirical data gathered at Palomar Airport. For each specific non-aviation oriented land use, a trip generation rate per acre was developed and applied.

Table 9 is a summarization of the projected 1990 daily trip generation charactrristics for Palomar Airport based upon the land uses in the airport master plan. As indicated, 3,065 daily trips are projected to be generated by general aviation related activities. Furthermore, because of the physical arrangements of FBO's on site, the trip origins north and south of the runway systems will be balanced. The industrial commercial land-use sector, for the most part, does not contribute traffic to internal circulation roadways. It has been assumed that this 27 acre (gross) parcel will be developed withlight manufacturing activities. Based upon empirical data from a San Diego Metropolitan Area Transportation Study, approximately 2,625 daily trips are projected. It must be recognized that the wide range of activities which could be developed on this parcel will have a more significant bearing on traffic generation than will general aviation related activities.

Table 9

PROJECTED 1990 DAILY TRIP GENERATION CHARACTERISTICS

Palomar Airport

LAND USE TYPE	GENERATOR	GENERATION RATE	TOTAL DAILY TRIPS
Fixed Base Operation	613 based aircraft	5.0/based aircraft	3,065
Industrial-Commercial	light manufacturing (21 net acres)	125/acre (net)	2,625
Recreational-Buffer	archery, ball fields, etc. (50 acres)	4/acre	200
		TOTAL	5,890

1990 Peak Hour Traffic Generation

Peak hour traffic volumes based upon total daily trips generated by the various land uses are shown in Table 10. The period during which auto traffic generated from the airport property will have the most critical impact on the adjacent street network and is projected to occur during the morning (7-8 AM) and evening (4-5 PM) peak highway traffic hours. The percentage distribution of daily trips assigned to the peak traffic hours for each land use category were based upon empirical data from previous studies conducted by Wilbur Smith and Associates at general aviation facilities and industrial-commercial complexes throughout Southern California.

As indicated in Table 10 approximately 825 peak morning hour inbound trips and 975 peak evening hour outbound trips are projected for the Palomar Airport complex. It is to be noted that approximately 20 per cent of these individual peak

hour volumes are general aviation related. Because of high morning and evening peaking characteristics associated with industrial-commercial activities it is apparent the precise extent of development in this land use sector significantly affects peak hour traffic generation. The specific impact of the peak hour traffic volumes shown in Table 10 must necessarily be evaluated in light of their distribution to various segments of the access system, in accordance with the traffic distribution developed for Palomar Airport. A daily and peak hour distribution of traffic to access roadways was made based upon grouping of vehicles to their specific land use origins or destinations and upon the developed traffic distribution. This type of analysis identifies projected traffic access deficiency areas and defines the scope of needed improvements to handle projected airport related demand.

Table 10

PEAK HOUR TRAFFIC GENERATION

Palomar Airport

	7-8 AM PEAK HIGHWAY HOUR		4-5 PM PEAK HIGHWAY HOUR	
LAND USE	Inbound	Outbound	Inbound	Outbound
Fixed Base Operations	165	15	105	195
Industrial-Commercial	650	70	90	760
Recreation-Buffer	10	3	7	20
TOTAL	825			975

1990 Projected Parking Requirements

Based upon empirical parking accumulation and turnover activity gathered by Wilbur Smith and Associates at Gillespie Field, Palomar Airport, and other general aviation airports in South-

ern California, parking requirements have been developed to satisfy the activity demands generated by the projected 613 based aircraft and their associated traffic generation characteristics for 1990. A summary of projected 1990 parking space requirements is shown in Table 11.

Table 11

PROJECTED 1990 PARKING REQUIREMENTS

Palomar Airport

LAND USE	PARKING SPACES
Fixed Base Operations	350
Industrial-Commercial	500
Recreation-Buffer	100
TOTAL	950

Chapter 4

RECOMMENDED ACCESS PLAN

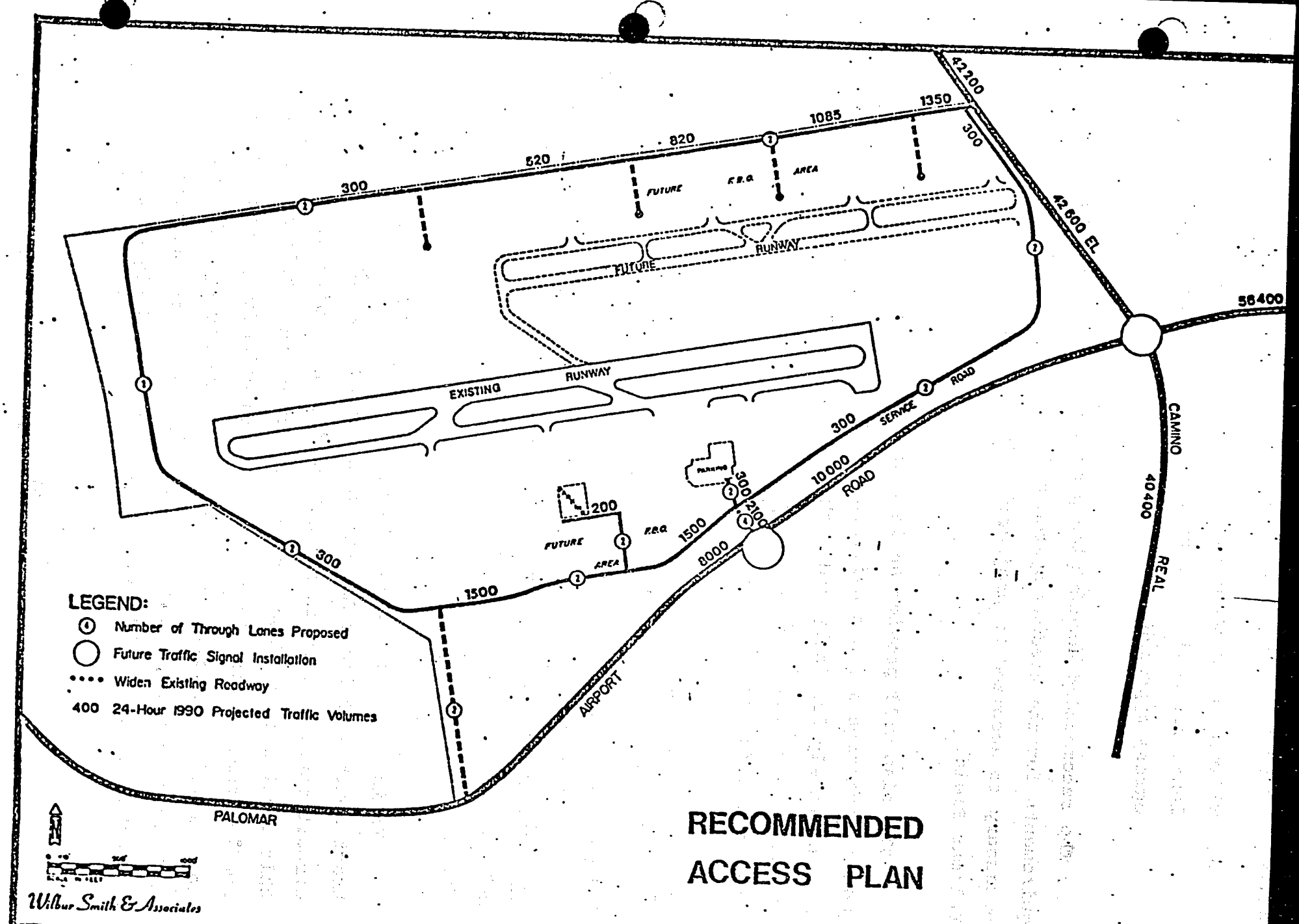
Palomar Airport is reasonably well located relative to freeway and local county route access. According to the 1990 Master Plan for Palomar Airport, activity at the airport will be limited to general aviation on site as well as minor light manufacturing development adjacent to Palomar Airport Road and west of El Camino Real. Accordingly, the contribution from the airport related activities will comprise a minor portion of the total projected 1990 future highway traffic on site access roadways.

Recommended Access Plan

The access plan for the recommended land use plan was developed considering development parking requirements, morning and evening peak hour traffic, and circulation requirements.

The recommended access plan contains the following major recommendations. (See Figure 3)

1. Provision for a loop access-service road to enhance circulation between site functions.
2. Provision for an additional access point from El Camino Real to enhance accessibility to fixed base operations adjacent to the proposed new runway.
3. Provision for a third future access point from Palomar Airport Road, to allow for possible long-range planning of commercial aviation activity.



RECOMMENDED ACCESS PLAN

Figure 3

4. Widening of Palomar Airport Road to four traffic lanes for additional storage capability on the egress approach.

The recommended access plan provides the planning requirements for the roadway system and traffic improvements necessary to accommodate projected 1990 traffic volumes at Palomar Field.

The plan will provide an increased level of service to general aviation and non-aviation related users. In view of the relatively low daily and peak hour traffic volume generated by airport related activities, when distributed to access roadways, major roadway improvements have not been recommended.

Given particular consideration in this traffic analysis was the need to provide signalization at one or both of the airport access points, or at Palomar Airport Road and El Camino Real. Based upon the 1990 projected traffic generated by airport related activities sustained hourly traffic volumes are not sufficient to justify or warrant traffic signalization in the site environs.

It is recognized that development of a large industrial tract south of Palomar Airport Road across from the existing airport entrance road is currently underway. Site plans for this tract include future signalization of the Palomar Airport Road/Palomar Airport Access Road intersection to permit efficient, safe movement of significant vehicular traffic to and from this industrial complex. The proposed widening of the airport access road will be compatible with this contemplated signalization.

Similarly, external airport land use development growth in the influence sphere of the airport will generate significant roadway traffic which will require future signalization at El Camino Real and Palomar Airport Road. Likewise, the development of a large industrial tract and refinery to the north of Palomar Airport, will undoubtedly create a need for signalization on El Camino Real near the airport north property line to adequately control access to this tract.

Evaluation of Future Transit Impact

The importance of transit within the total transportation network of San Diego County has been recognized by the Comprehensive Planning Organization and significant steps for the improvement of transit service and facilities have been undertaken. The Transit Development Plan and Program for the City of San Diego was completed in 1970, and outlined short-range operational improvement programs for San Diego transit.

At present, the Comprehensive Planning Organization is evaluating six alternative transit plans, including express and local bus improvements in the North County area. No fixed rail improvements are contemplated for the North Country. The plan review, adoption, and implementation process necessary to bring a transit system to Palomar Field requires comments from the C.P.O. Board of Directors, County Board of Supervisors, local Planning Commissions, management, engineering, and planning officials of the Region's several jurisdictions. In view of these facts, the high percentage of auto orientation assumed in developing the findings of this report will not be changed substantially in the foreseeable future.

If rapid transit is brought in to Palomar Field it should be connected to parking facilities on site. Recent studies at several U.S. airports have shown that aviation-oriented individuals who are confronted with a choice of transportation modes tend to use the faster and more convenient mode even if it costs more. However, there is a future potential for providing transit service to employees who will work at and adjacent to Palomar Field in Industrial and Commercial areas.

Conclusions

The studies of traffic and access in the environs of the proposed Palomar Airport 1990 Master Plan area indicate the need for certain access modifications, as shown in the Recommended Access Plan, if a reasonably adequate level of service is to be provided projected traffic. In general, the traffic volumes projected for airport related activities can be adequately handled without modifications to the external access system. Some minor congestion, in parking facilities and on access roadways, is to be anticipated during peak highway traffic hours, generally as a result of non-aviation related industrial-commercial activity within the airport property. Major access roadway improvements, including widening of both Palomar Airport Road and El Camino Real to their ultimate six lane roadway sections, and traffic signal installations, will result primarily from future growth of regional external high density land uses.

COUNTY OF SAN DIEGO

PUBLIC WORKS AGENCY

DEPARTMENT OF COUNTY ENGINEER

Biology Survey

of the

Proposed

Palomar Airport Master Plan

Project No. UJ0086

Prepared For: Department of General Services
Airports Division

Prepared By:

Jack A. Redfern

Jack A. Redfern
B. A. Life Sciences
Department of County Engineer
San Diego County, California

May 14, 1975

PALOMAR AIRPORT MASTER PLAN

BIOLOGY

Introduction

On May 7, 8, 9, and 11, 1975, a biology field survey of the area encompassed by the Palomar Airport Master Plan was performed by Jack A. Redfern, of the Department of County Engineer. A total of 17 hours was spent in field work.

The purpose of the survey was to describe the flora and fauna observed on and in the vicinity of the site, to ascertain if any endemic or endangered species reside in the area, determine the environmental impact of the ultimate implementation of the plan on the biota, and to recommend mitigating actions to lessen the impact of the project on the biotic environment.

Methodology

Because of the size of this proposed project (± 500 acres), the difficulties encountered in penetrating the heavy growth of brush in certain locations, and limitations on time and fiscal resources, it was not possible to field survey the entire area involved in the plan in detail. Emphasis was directed toward those areas that had the richest native vegetation cover, in particular, the areas around the ponds and vernal pools and those other areas most likely to provide wildlife habitat. There was agreement between the Office of Environmental Management and the sponsoring agency that the large area (234 acres) designated as clear zone in the Master Plan, would not be included in this survey. The method used to conduct the survey consisted of

performing a series of transects. Several pit traps were placed in select areas. Observations were conducted during daylight hours. The air temperature was relatively cool for this season of the year. The sky was mostly overcast, but visibility was good. Wildlife observations were augmented with the aid of 7 x 35 binoculars.

Munz and Keck (1959) as modified by Munz (1968), was used as naming authority for plant identification. Common names of plants were derived from Munz (1968) and also from McMinn (1939).

DESCRIPTION OF ENVIRONMENTAL SETTING

Flora

This survey was performed during the latter part of a delayed spring season. Verbal communication with Moran and Witham, botanists associated with the San Diego Museum of Natural History, confirmed that the springtime climate in San Diego County was approximately three (3) weeks behind schedule. Because of this, spring wildflowers normally past their peak bloom, were in abundance and blooming at this time. Most vegetation appeared to be in a vigorous state of growth as a result of this year's late spring rains. The region would present a decidedly different appearance after a long, dry, and warm summer.

Plant Communities

The plant community occupying most of the proposed site can be classified as coastal sage scrub as defined by Munz and Keck (1959). However, because of the natural overlapping of many indicator species, particularly in areas of transection such as encountered on this site, a well-defined community has not developed. It may be more accurate to classify the community east of El Camino Real (S 11) as chaparral. The California Fish and Wildlife Plan, 1965, lists San Diego County as having 364,365 acres or 13.4 percent of its total acreage in coastal sage scrub. Species typical of the community observed on the site are: California sagebrush (Artemisia californica), California buckwheat (Eriogonum fasciculatum), lemonadeberry (Rhus integrifolia), California encelia

(Encelia californica) and black sage (Salvia mellifera).

Included within this large community are several distinct vegetative associations. These areas include: coastal sage scrub preclimax and climax, coastal sage scrub - chaparral transition, riparian, grassland, cultivated and disturbed associations. There was no evidence of recent wildfire in any of the areas surveyed. The various vegetative areas are somewhat separated from one another by man-made barriers such as the existing airport facilities and surrounding highways.

A description of the distinct vegetative areas follows (see Vegetative Map accompanying this report).

Area A

This triangular shaped parcel consists of approximately 20 acres located adjacent to the southwest corner of the airport runway. Within this area, a soil conservation dam has impounded surface runoff forming a pond with a surface area of about one-half acre at the time of the survey.

Apparently, this pond contains water throughout the year as evidenced by the absence of die-back riparian vegetation. Typical plant species associated with this area include: cattail (Typha domingensis), rush (Juncus sp.), tule (Scirpus sp.) and willow dock (Rumex salicifoluis).

Also included within this triangular area and consisting of possibly five acres is a plot of land previously cultivated, possibly as recently as last year. This area now supports volunteer tomato plants and a luxurious cover of plants typical of recently disturbed fertile soil, such as: field mustard (Brassica

campestris), black mustard (B. nigra), wild radish (Raphanus sativus), star thistle (Centaurea melitensis), and Italian thistle (Carduus pycnocephalus).

The balance of Area A consists of vegetative types normally associated with areas that are reverting back (preclimax) to the coastal sage scrub community and that have not yet attained the climax stage of development. Typical species occupying this area include: California sagebrush (Artemisia californica), California buckwheat (Eriogonum fasciculatum), lemonadeberry (Rhus integrifolia), and a few prickly pear cactus (Opuntia littoralis). California sagebrush is by far the dominant plant in this association.

Area B

This area consists of perhaps two acres adjacent to Palomar Airport Road (S 12) and bounded on the west by the airport entrance road and on the north by the airport runway landfill. This area mostly supports native flora typical of distressed soil situations. Except for some non-native species such as ice plant (Mesembryantemum sp.) and "feather grass" the dominant vegetation consists of Russian thistle (Salsola kali var. tenuifolia), Indian tobacco (Nicotiana begelovii), Jimson weed (Datura meteloides), coyote brush (Baccharis pilularis), field mustard (B. campestris), and Italian thistle (C. pycnocephalus).

Area C

Nineteen acres at the southwest quardrant of the intersection of Palomar Airport Road (S 12) and El Camino Real (S 11). The North County Animal Shelter

is located within this parcel. Also included because of its proximity and floral similarity to Area C is a small vegetated area of less than one acre located in the northwest quadrant of the same intersection.

Area C contains an extremely heavy growth of coastal sage scrub/chaparral. For the most part, it is virtually impenetrable. This community has reached its climax and is probably in its senescent stage of development. This is evidenced by the predominance within this community of only a few indicator species but with individual plants attaining a large size. The dominant species is scrub oak (Quercus dumosa), which is indicative of chaparral. Other prominent species in their order are: lemonadeberry (R. integrifolia), chamise (A. fasciculatum), black sage (Salvia mellifera), and Spanish dagger (Yucca schidigera).

Area D

Consists of approximately nine acres at the southeast quadrant formed by the intersection of El Camino Real (S 11) and Palomar Airport Road (S 12).

At the time of the field survey, this parcel of land had been cultivated but not planted.

Area E

Is located adjacent to the north boundary of the completed Palomar Sanitary Landfill site and west of El Camino Real (S 11). It covers approximately eight acres. It is an extension of the climax stage development of the coastal sage scrub/chaparral community previously described in Vegetative Area C.

The noteworthy exception is California sagebrush (A. californica), which forms an association along the north edge of the dense coastal sage scrub vegetation.

Area F

This vegetative area is situated adjacent to the north boundary of Vegetative Area E and extends northerly beyond the northern limits of the proposed Airport Master Plan. It includes about 20 acres. The area is unique in that it normally contains both year-round and seasonal (vernal) pools. The year-round ponds are the result of past human activities that included clay mining (Sherrod, 1974) and, more recently, agriculture. The vernal pools are formed as a result of surface irregularities surrounding the mima mounds found within the area.

The floral type covering most of this area consists of an association of California sagebrush, deerweed (Lotus scoparius), annual grasses and a large selection of spring wildflowers such as blue-eyed grass (Sisyrinchium bellum), red-stem filaree (Erodium cicutorium), blue dicks (Brodiaea pulchella), goldfields (Lasthenia chrysostoma), and dandelion (Taravacum officinale) to name just a few.

Because of the short-lived nature of the vernal pools, the flora normally associated with riparian habitat was not evident.

Area G

This large area estimated at over forty acres includes the major agricultural enterprise within the limits of the Airport Master Plan. At the time of the survey, it was being dry farmed, the crop being barley (Hordeum sp.)

The cultivated areas are surrounded by vegetation similar to that found in Area F as these associations are continuous.

Area H

The terrain in this area is mostly hilly. It occupies between thirty and forty acres (estimated) at the northwest section of the proposed Master Plan. Surface evidence indicates that the area had at one time been cultivated. The native vegetation is now in the process of reverting back to coastal sage scrub. For this reason, the vegetation appears similar to that observed on the opposite side (south) of the existing airport runway. This is expected as the two areas were contiguous before the runway embankment separated them. Typical species found in this area are described as preclimax types in the discussion concerning Area A.

Area I

This area, designated as Clear Zone in the Master Plan, is a portion of the large parcel of County-owned property situated east of El Camino Real (S 11). It was not surveyed in detail at this time. However, a cursory drive-through and a single transect indicated the entire 234 acres to be supporting a significant habitat. The portion north of the Clear Zone contains an artesian spring, several ponds, ephemeral streams and dense vegetation in some areas. Several plant species not previously encountered during the survey were noted within the Clear Zone. The species were: coast live oak (Q. agrifolia), poison oak (Rhus diversiloba), mission-manzanita (Xylococcus bicolor), miner's lettuce

(Montia perfoliata) and fern. The overall community classification would probably be coastal sage scrub. The presence of some chaparral community indicator species reflects the transitional nature of the habitat.

A comprehensive list of plant species observed in the vicinity of the proposed Palomar Airport Master Plan is included at the end of the report.

No endemics or plants listed as rare by the California Native Plant Society were observed during the course of this field survey.

Fauna

The wildlife survey for this project spanned four days and consisted of seventeen hours of field observation performed concurrently with the floral survey. The scope of this wildlife report is, therefore, limited to those species observed on the site or presumed to be present by other evidence, such as scats, calls or tracks. These wildlife indicators provide an aid to species identification and an index to faunal density.

This discussion will address the wildlife communities and a description of the major classes of animals found on the site. Following this report is a complete list of faunal species.

Wildlife Communities

In any wildlife community, the type of plants found determine the type of animal life it can support. Environmental conditions such as weather, geographic location, and topography also influence the type of flora and fauna found in a particular wildlife habitat. In the vicinity of the proposed Master Plan,

there are at least three distinct faunal habitats. These closely correspond to the three major floral associations, the coastal sage scrub/chaparral, the riparian, and the disturbed.

Coastal Sage Scrub/Chaparral Communities

In the coastal sage scrub community, rodents, such as the wood rat and California ground squirrel were found. Other mammals which also thrive in this and in disturbed habitats are the desert cottontail, coyote, black-tailed jack rabbit, pocket mouse, and deer mouse, striped and spotted skunks. Animal trails and burrows were observed throughout the site. Fecal evidence (scat) of coyote and small rodents was especially concentrated within vegetative areas E, H, and N.

Birds found here include California quail, California thrasher, western meadowlark, common bushtit, scrub jays, brown towhees, and mockingbirds. In addition, one adult red-tailed hawk was sighted.

Only two species of reptiles were observed. Several western fence lizards were observed in vegetative areas E and N, and a single western rattlesnake was also observed in vegetative area E.

Riparian Habitat

The ponds located in vegetative areas A and F are important to the ecosystem not only in this area but to systems outside the boundaries of the proposed Airport Master Plan. This is especially true in the case of birds. The riparian resources supply water while the coastal sage scrub community

provides a source of food. The availability of these resources determine what animals and plants can exist in a given area. A year-round water supply sustains a more diverse wildlife community than would be possible without the water.

The riparian habitat contained mostly horned lark, black phoebe, red-winged blackbird, and swallows. A pair of cinnamon teals were observed on the pond located in vegetative area A. Additional species of migratory birds would be expected on the site during other seasons.

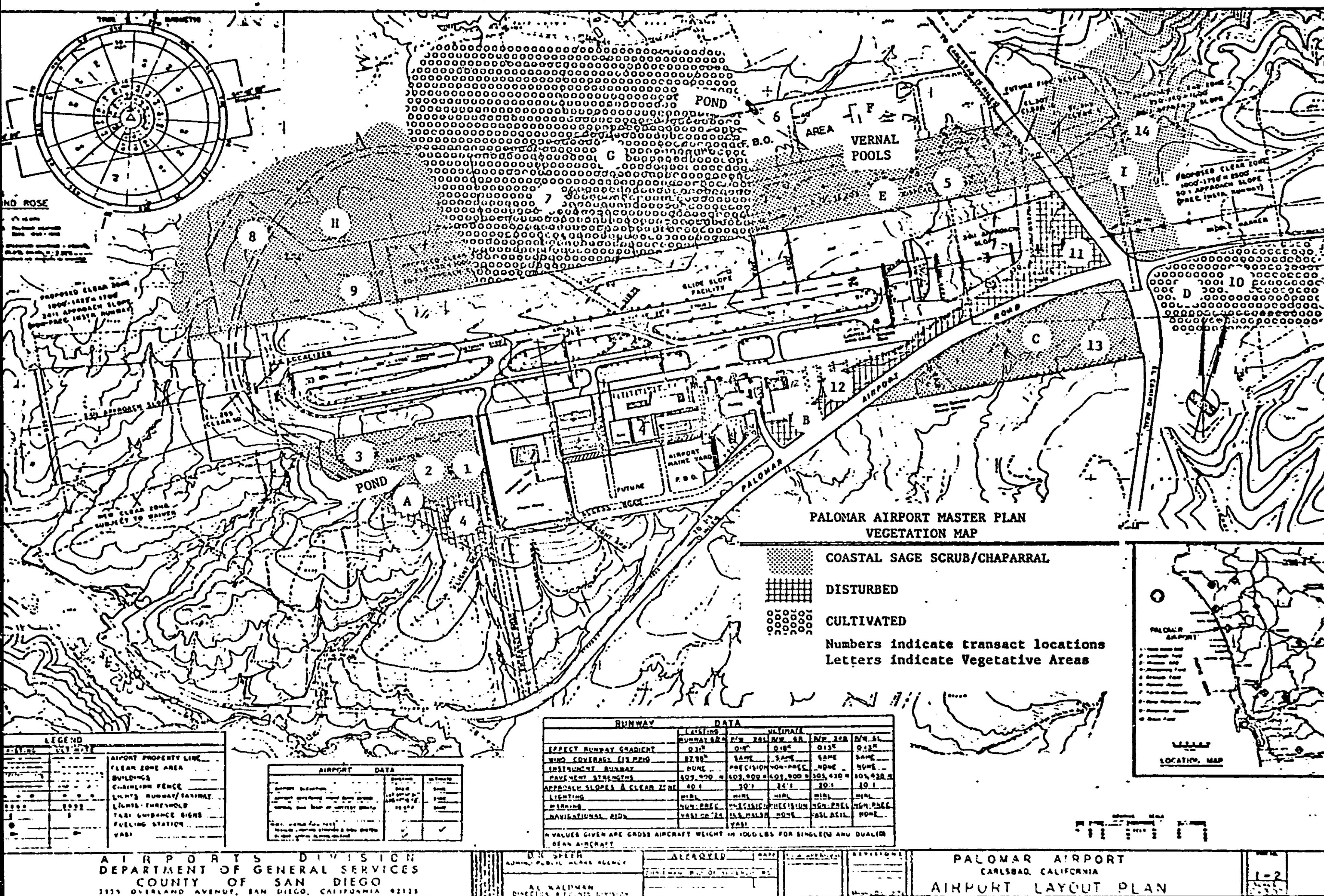
Both the ponds and vernal pools provide habitat for amphibians. Frogs and toads were observed in the vicinity of the riparian habitats. A heavy concentration of tadpoles was noted within the vernal pools. In addition, salamanders would be expected to be a part of the riparian community. No fish were observed in any of the ponds although mosquitos are probably present.

The importance of vernal pools revolves around their short annual life. A unique ecosystem has developed as a result of their temporary water supply. Certain animals that utilize this habitat have developed very abbreviated life cycles. Without this water, these animals could not reproduce and continue their life cycles. Frequently vernal pools are the only source of natural water in an area.

Insofar as the disturbed habitats are concerned, no significant wildlife was noted. Because of the close association of the disturbed areas (including agriculture) to the native communities, free movement of wildlife between the habitats could be expected.

Two pit traps were left overnight, May 8, in vicinity of the ponds in vegetative areas A and F. The results for vertebrates were negative from both traps.

A list of typical wildlife species inhabiting coastal sage scrub and chaparral communities is included at the end of this report.


PALOMAR AIRPORT MASTER PLAN
VEGETATION MAP
COASTAL SAGE SCRUB/CHAPARRAL
DISTURBED
CULTIVATED
Numbers indicate transact locations
Letters indicate Vegetative Areas
POND
POND
VERNAL
POOLS
AREA
F. B. O.
GLIDE SLOPE
FACILITY
AIRPORT
PALOMAR
ROAD
AIRPORT
MAINT YARD
F.B.O.
FUTURE
WIND ROSE
LOCATION MAP
RUNWAY DATA
AIRPORT DATA
LEGEND
AIRPORTS DIVISION
DEPARTMENT OF GENERAL SERVICES
COUNTY OF SAN DIEGO
PALOMAR AIRPORT
CARLSBAD, CALIFORNIA
AIRPORT LAYOUT PLAN
1-2

BIOLOGY FIELD REPORT SHEET

SPECIES — Scientific name / Common name	LOCATION 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	2
RHUS LAURINA (Nutt.) in T. &. G. Laurel Sumac			X																	
R. INTEGRIFOLIA (Nutt.) Benth. & Hook. Lemonudeberry	X		X		X			X	X		X		X	X						
ARTEMISIA CALIFORNICA – Less. California Sagebrush	X	X	X		X			X	X											
HETEROMELES ARBUTIFOLIA – M. Roem. Toyon or Christmas-Berry			X		X			X					X	X						
ERIOGONUM FASCICULATUM – Benth. California Buckwheat			X		X			X												
BRASSICA CAMPESTRIS – L. Field Mustard		X		X	X						X	X								
B. NIGRA – L. Koch. Black Mustard	X	X		X		X														
ADENOSTOMA FASCICULATUM – H. & A. Chamise or Greasewood	X				X			X			X		X	X						
FOENICULUM VULGARE – Mill. Sweet Fennel												X								
XYLOCOCCUS BICOLOR (Nutt.) Gray Mission-Manzanita														X						
SALSOLA KALI – L. var. TENUIFOLIA – Tausch. Russian Thistle												X								
SALVIA MELLIFERA – Green Black Sage					X						X		X							
QUERCUS DUMOSA (Nutt.) Scrub Oak					X			X			X		X	X						
Q. AGRIFOLIA – Nee. Coast Live Oak														X						

BIOLOGY FIELD REPORT SHEET

SPECIES	LOCATION																			
Scientific name Common name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	2
NICOTIANA GLAUCA - Grah. Tree Tobacco												X								
DATURA METELOIDES - A. DC. Jimson Weed												X								
OPUNTIA LITTORALIS (Engelm.) Ckll. Prickly Pear Cactus			X		X			X			X			X						
YUCCA SCHIDIGERA - Roezl ex Ortgies. Spanish Dagger					X						X		X	X						
SIDALCEA MALVAEFLORA - DC. Gray ex Benth. Checker-bloom - ssp. sparsifolia C. L. Hitch.	X		X		X			X												
SISYRINCHIUM BELLUM - Wats. Blue-eyed Grass	X	X			X				X		X									
ERODIUM CICUTARIUM (L.) L'Her. Red-stem Filaree	X			X	X	X		X	X		X	X		X						
ERIOPHYLLUM CONFERTIFLORUM (DC.) Gray. Yellow yarrow	X		X		X			X	X		X			X						
RUMEX SALICIFOLIUS - Weinm. Willow Dock		X																		
TYPHA DOMINGENSIS - Pers. Cat-tail		X																		
JUNCUS - sp. Rush		X				X														
SCIRPUS - sp. Bulrush or Tule		X																		
SALIX LASIOLEPIS - Benth. Arroyo Willow		X																		
ENCELIA CALIFORNICA - Nutt. Encelia			X																	

BIOLOGY FIELD REPORT SHEET

PRC

OBS

SPECIES Scientific name Common name	LOCATION 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	2
BRODIAEA PULCHELLA (Salish.) Greene Blue Dicks	X		X	X				X			X			X						
MARAH MACROCARPUS (Greene) Greene Wild-Cucumber			X								X			X						
LASTHENIA CHRYSOSTOMA - F. & M. Goldfields	X	X	X		X			X	X		X			X						
ANAPHALIS MARGARITACEA (L.) Benth. ex Clarke Pearly Everlasting	X				X			X			X									
BACCHARIS PILULARIS - DC. ssp. CONSANGUINEA Coyote Brush (DC.) C. B. Wolf	X				X	X						X								
MIMULUS LONGIFLORUS (Nutt.) Grant. Bush Monkey Flower					X			X			X		X	X						
SENECIO VULGARIS - L. Common Groundsel	X																			
LOMATIUM DASYCARPUM (T. & G.) Coult. & Rose Lomatium or Wild Parsley					X			X						X						
SALVIA COLUMBARIAE - Benth. Chia					X			X												
MARRUBIUM VULGARE - L. Horehound					X															
LOTUS SCOPARIUS (Nutt. in T. & G.) Otley. Deerweed	X				X			X			X	X		X						
RAPHANUS SATIVUS - L. Wild Radish				X	X	X														
COTULA CORONOPIFOLIA - L. Brass Buttons																				
TARAXACUM OFFICINALE - Wiggers. Dandelion	X	X		X		Y		Y			Y	Y								

BIOLOGY FIELD REPORT SHEET

PRO

OBS

SPECIES / LOCATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	2
Scientific name Common name																				
SOLANUM XANTII - Gray. Purple Nightshade					X						X		X							
MESEMBRYANTEMUM - sp. L. Sea Fig or Ice Plant												X								
MONTIA PERFOLIATA (Donn.) Howell Miner's Lettuce														X						
PLANTAGO LANCEOLATA - L. English Plantain		X				X														
P. HOOKERIANA - F. & M. var. CALIFORNICA Plantain (Green) Poe.	X		X									X								
CENTAUREA MELITENSIS - L. Star Thistle or Tocalote				X								X								
CARDUUS PYCNOCEPHALUS - L. Italian Thistle	X			X	X						X	X								
LYCOPERSICON ESCULENTUM - Mill. Tomato				X																
HORDEUM - sp. L. Barley (cultivated)							X													
RHUS DIVERSILOBA - T. & G. (Green) Poison Oak														X						

16.

ENVIRONMENTAL IMPACT OF THE PROPOSED MASTER PLAN

The Ultimate Land Use Plan of the Palomar Airport Master Plan would be phased to span fifteen years. The final development stage referred to as long-term would be from 1980 to 1990. By 1990 much of the land located west of El Camino Real (S 11) and included within the boundaries of the Master Plan will have been developed for industrial/commercial and aviation oriented activities. This will entail the loss of an estimated 150 acres of land now providing habitat of one type or another. A rough breakdown of this habitat would be as follows: coastal sage scrub/chaparral, 70 acres; disturbed, 40 acres; and cultivated, 40 acres. Included within the coastal sage scrub/chaparral habitat are the riparian resources. These include the year-round ponds and vernal pools which are both limited and valuable natural resources within San Diego County. According to the California Fish and Wildlife Plan, 1965, of San Diego Counties, total acreage, less than 0.2 percent is riparian.

The loss of approximately 40 acres of cultivated land presently devoted to the production of barley will have an incremental effect of reducing County cropland. Field crops are big business in San Diego County. In 1973, field crop production from 413,850 acres had a total value of $3,084,800. [1] Of this harvested acreage, barley accounted for 9,330 acres with a value of $1,064,000.

The loss of vegetation will be significant. The ecological effect of removing vegetation will be the destruction of wildlife habitat. With the

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[1] Agricultural Crop and Natural Resources Report, 1973. County of San Diego, Department of Agriculture, Weights and Measures.

elimination of small animal habitats, the area will cease to contribute to the support of bird and mammal predators and reptiles. This will intensify competition for remaining habitats not only within the boundaries of the site but to a greater degree in the surrounding undeveloped land. Animal species that now periodically visit the site will be adversely affected.

The filling in of the ponds and vernal pools that now provide water and breeding resources for wildlife will eliminate the only year-round and seasonal sources of available water found on the site.

The presence of man and attendant urbanization will have an adverse effect on the wildlife of the area. Natural drainage patterns may be altered. This would present a potential threat to downstream riparian resources from industrial and aircraft associated pollutants.

Aircraft arrival and departure and the attendant noise should not have any appreciable adverse impact on wildlife.

The impact on the biotic resources of the large parcel of County owned property east of El Camino Real (S 11) designated as Clear Zone will NOT be significant. The Master Plan calls for this to be included as part of the airport recreation/buffer zone.

In summary, the area encompassed by the plan does not contain any rare, endemic or endangered wildlife species, but it does contain a diversified biotic community that contributes incrementally to the natural resources of the region.

MITIGATING ACTION

Palomar Airport is bounded on three sides by the City of Carlsbad. At the present time, the city has plans to annex the unincorporated area immediately north of the airport, thus increasing the potential to develop. Hopefully, the city will establish a greenbelt-open space system within this now largely undeveloped area. Also located within this same area are several large (± 1 acre) size year-round ponds. If these ponds are preserved and incorporated in an open space system, they will partially compensate for the loss of riparian resources located within the Master Plan.

Within the Airport Master Plan, the following mitigating actions are recommended to be incorporated with the phased development.

1. The integrity of the riparian resources should be maintained as long as possible to provide water and breeding habitat for wildlife.
2. Vegetation should not be removed too far in advance of phased development. Where possible, viable vegetative islands should be preserved to encourage wildlife and provide additional buffer zones.
3. Landscape, using native plants, on cut and fill slopes. This will reduce erosion potential and improve the appearance of the project by helping to blend it into the natural surroundings, especially adjacent to buffer zones.

4. Natural drainage courses should be preserved where possible to retard siltation of off-site riparian resources.

5. As recommended in the draft EIS for Palomar Airport prepared by Ray Glass, the potential for contamination by gasoline and engine oil exists. The capability for hose-down runoff should be designed so a holding tank will be provided with proper vapor controls to handle volatile substances.

6. The large Clear Zone (vegetative area I) east of El Camino Real (S 11) should be preserved as open space. This unique area provides excellent habitat. It appears to be well suited for a passive recreation type park or nature preserve.

SPECIES LIST

Vegetation

This species list is composed of plants observed on the Palomar Airport Master Plan site, or on adjacent property, at the time of the survey. Additional species would be expected at various times of the year.

The symbols below are used on the list to indicate the following information:

1. Vegetative Area distribution (Refer to accompanying map)

   Areas A through I

2. Plant is non-native (exotic) to San Diego County

   (i) Introduced / non-native

3. Indicator species for community or association

   a. Coastal Sage Scrub*
   b. Chaparral*
   c. Cultivated
   d. Disturbed
   r. Riparian

* Munz & Keck, 1959.

Family:	Agavaceae		
	Yucca schidigera Roezl ex Ortgies	C, E, H, I	Spanish Dagger or Mohave Yucca
Family:	Aizoaceae		
	Mesembryanthemum sp. L.	Bd, (i)	Sea Fig or Ice Plant
Family:	Amaryllidaceae		
	Brodiaea pulchella (Salish.) (Greene)	A, E, H, I	Blue Dicks
Family:	Anacardiaceae		
	Rhus diversiloba T. & G. (Greene)	Ib	Poison Oak
	R. integrifolia (Nutt.) Benth & Hook	Aa, Ca, Ea, Ha, Ia	Lemonadeberry
	R. laurina (Nutt.) in T. & G.	H	Laurel Sumac
Family:	Cactaceae		
	Opuntia littoralis (Engelm.) Ckll.	A, C, E, H, I	Prickly Pear Cactus
Family:	Chenopiaceae		
	Salsola kali L. tenuifolia Tausch.	Bd, (i)	Russian Thistle
Family:	Compositae		
	Anaphalis margaritacea (L.) Benth. ex Clarke	A, C, E, H	Pearly Everlasting
	Baccharis pilularis DC. ssp. consanguinea (DC). C. B. Wolf	A, B, E	Coyote Brush
	Carduris pycnocephalus L.	Ad, Bd, (i)	Italian Thistle
	Centaurea melitensis L.	Ad, Bd, (i)	Star Thistle or Tocalote
	Cotula coronopifolia L.	A, B, H, (i)	Brass Buttons
	Encelia californica Nutt.	Aa	Encelia
	Eriophyllum confertiflorum (DC.) Gray	Aa, Ca, Ea, Ha, Ia	Yellow Yarrow
	Lasthenia chrysostoma F. & M.	A, C, E, H, I	Goldfields
	Senecio vulgaris L.	Ad, (i)	Common Groundsel
	Taravacum officinale Wiggers.	Ad, Bd, Cd, Ed, I, (i)	Common Dandelion
	Artemisia californica Less.	Aa, Ea, Ha	California Sagebrush
Family:	Cruciferae		
	Brassica campestris L.	Ad, Bd, Cd, Ed, (i)	Field Mustard
	B. nigra (L.) Koch.	Ad, Ed, (i)	Black Mustard
	Raphanus sativus L.	Ad, Ed, (i)	Wild Radish

Family:	Plantaginaceae		
	Plantago lanceolata L.	Ad, Fr, (i)	English Plantain
	P. hookeriana F. & M. var. California (Greene) Pol.	A, Bd	Plantain
Family:	Polygonaceae		
	Rumex salicifolius - Weinm.	Ar	Willow Dock
	Eriogonum fasciculatum Benth.	Aa, Ea, Ha	California Buckwheat
Family:	Portulacaceae		
	Montia perfoliata (Donn.) Howell	I	Miner's Lettuce
Family:	Salicaceae		
	Salix lasiolepis - Benth.	Ar	Arroyo Willow
Family:	Scrophulariaceae		
	Mimulus longiflorus (Nutt.) Grant.	C, H, I	Bush Monkey Flower
Family:	Solanaceae		
	Datura meteloides - A. DC.	Bd, (i)	Jimson Weed
	Lycopersicon esculentum Mill.	Ad, (i)	Tomato
	Nicotiana glanca Grah.	Bd, (i)	Tree Tobacco
	Solanum xantii Gray.	Cd, Ed	Purple Nightshade
Family:	Typhaceae		
	Typha domingensis Pers.	Ar	Cat-tail
Family:	Umbelliferae		
	Foeniculum vulgare Mill.	Bd, (i)	Sweet Fennel
	Lomatium dasycarpum (T.& G.) - Coult. & Rose.	E, Hd, Id	Lomatium or Wild Parsley
Family:	Rosaceae		
	Adenostoma fasciculatum H. & A.	Ab, Cb, Eb, Hb, Ib	Chamise or Greasewood
	Heteromeles arbutifolia M. Roem.	Ab, Cb, Eb, Hb, Ib	Toyon or Christmas-Berry

Family:	Cucurbitaceae *Marah macrocarpus* (Greene) Greene	A, C, I	Wild Cucumber
Family:	Cyperaceae *Scripus* sp.	Ar	Bulrush or Tule
Family:	Ericaceae *Xylococcus bicolor* Nutt.	Ib	Mission Manzanita
Family:	Fagaceae *Quercus agrifolia* Nee. *Q. dumosa* Nutt.	I Cb, Eb, Hb, Ib	Coast Live Oak Scrub Oak
Family:	Geraniaceae *Erodium cicutarium* (L.) L'Her.	Ad, Bd, Cd, Ed, Hd, Id, (i)	Red-stem Filaree
Family:	Gramineae *Hordeum* sp. L.	Gc	Barley
Family:	Iridaceae *Sisyrinchium bellum* Wats.	A, C, E, F, H	Blue-eyed Grass
Family:	Juncaceae *Juncus* sp. L.	Ar, Fr	Rush
Family:	Labiatae *Marrubium vulgare* L. *Salvia columbariae* Benth.	Ed, (i) E, H	Horehound Chia
Family:	Leguminosae *Lotus scoparius* (Nutt. in T. & G.) Ottley.	A, Bd, E, H, I	Deerweed
Family:	Malvaceae *Sidalcea malvaeflora* (DC.) Gray ex Benth. ssp. *sparsifolia* C. L. Hitchc.	A, E, H	Checker-bloom

PALOMAR AIRPORT MASTER PLAN

ANIMAL SPECIES LIST

Field Dates: May 7, 8, 9, and 11, 1975
Time: 17 hours, daylight (10:00 a.m. - 3:00 p.m.)

Observation and Habitat Key

0	=	Observed	S	=	Scat	C	=	Coastal Sage Scrub/Chaparral Community
V	=	Voice	N	=	Nest			
F	=	Feathers	T	=	Tracks	Rp	=	Riparian
						l	=	Landfill

Reptilia - Reptiles

ORDER: Squamata: Snakes and Lizards
Suborder: Lacertilia - Lizards

Family: Iguanidae
Sceloporus occidentalis - Western Fence Lizard — O, C

Suborder: Ophidia

Family: Colubridae
Crotalus viridis - Western Rattlesnake — O, C

Aves - Birds

ORDER: Falconiformes - Birds of Prey

Family: Accipitridae
Buteo jamaicensis - Red-tailed Hawk — O, C, Rp

ORDER: Galliformes

Family: Phasianidae
Lophortyx californicus - California Quail — O, V, C

ORDER: Columbiformes

Family: Columbidae
Zenaidura macroura - Mourning Dove — O, C, Rp

ORDER:	Cuculiformes	
Family:	Cuculidae	
	Geococcyx californianus - Roadrunner	O, C
ORDER:	Anseriformes	
Family:	Anatidae	
	Anas cyanoptera - Cinnamon Teal	O, Rp
ORDER:	Passeriformes	
Family:	Tyrannidae	
	Sayornis nigricans - Black Phoebe	O, Rp
Family:	Hirundinidae	
	Hirundo rustica - Barn Swallow	O, Rp
Family:	Corvidae	
	Aphelocoma coerulescens - Scrubjay	O, V, C
Family:	Paridae	
	Psaltriparus minimus - Common Bushtit	O, V, C
Family:	Mimidae	
	Mimus polyglottos - Mockingbird	O, V, C
	Toxostoma rufum - California Thrasher	O, C
Family:	Icteridae	
	Agelailis phoeniceus - Red-winged Blackbird	O, Rp
	Sturnella neglecta - Western Meadowlark	O, V, C,
Family:	Fringillidae	
	Pipilo fuscus - Brown Towhee	O, V, C
Family:	Alaudidae	
	Eremophila alpestris - Horned Lark	O, Rp

Mammalia - Mammals

ORDER:	Lagomorpha - Rabbits and Hares	
Family:	Leporidae	
	Sylvilagus auduboni - Desert Cottontail	O, C
	Lepus californicus - Black-tailed Jack Rabbit	O, C

ORDER: Rodentia - Rodents

Family:	Sciuridae Otospermophilus beecheyi - California Ground Squirrel	O, C, Rp
Family:	Cricetidae Neotoma fuscipes - Dusky-footed Wood Rat	N, C
Family:	Geomyidae Thomomys bottae - Southern Pocket Gopher	O, N, C, R

ORDER Carnivora - Carnivores

Family:	Canidae Canis latrans - Coyote	S, C

EXPECTED SPECIES LIST

Osteichthyes - Fish

ORDER: Cyprinodontes

Family: Poecilidae
Gambusia affinis - Mosquito fish

Amphibia - Amphibians

ORDER: Caudata

Family: Plethodontidae
Aneides lugubris - Arboreal Salamander

ORDER: Salientia

Family: Pelobatidae
Scaphiopus hammondi - Western Spadefoot

Family: Bufonidae
Bufo boreas - Western Toad
Bufo microscaphus - Southwestern Toad

Family: Hylidae
Hyla regilla - Pacific Treefrog

Family: Ranidae
Rana catesbeiana - Bullfrog

Reptilia - Reptiles

ORDER: Squamata: Snakes and Lizards

Suborder: Lacertilia - Lizards

Family: Iguanidae
Sceloporus orcutti - Granite Spiny Lizard
Phrynosoma coronatum - California Horned Lizard

Family: Teiidae
Cnemidophorus tigris - Western Whiptail

Family: Anguidae
Gerrhonotus multicarinatus - Southern Alligator Lizard

Suborder: Ophidia

Family: Colubridae
Masticophis taeniatus - Striped Whipsnake
Masticophis flagellum - Red Racer (Coachwhip)
Pituophis melanoleucus - Gopher Snake
Thanmophis sirtalis - Common Garter Snake

Aves - Birds

ORDER: Falconiformes - Birds of Prey

Family: Accipitridae
Buteo eineatus - Red-shouldered Hawk

Family: Falconinidae
Falco sparverius - Sparrow Hawk

ORDER: Charadriiformes - Shore Birds

Family: Charadriidae
Charadrius vociferus - Killdeer

ORDER: Columbiformes - Pigeons and Doves

Family: Columbidae
Strenptopelia chinensis - Spotted Dove

ORDER: Strigiformes - Owls

Family: Strigidae
Asio otus - Long-eared Owl
Bubo virginianus - Great Horned Owl

ORDER: Apodiformes

Family: Trochilidae
Calypte anna - Anna's Hummingbird

ORDER: Passeriformes

Family: Tyrannidae
Pyrocephalus rubinus - Vermillion Flycatcher

Family: Hirundinidae
Petrochelidon pyrrhonota - Cliff Swallow

Family: Corvidae
Corvus corax - Common Raven
Corvus brachyrhynchos - Common Crow

Family: Paridae
Parus inornatus - Plain Titmouse

Family: Chamaeidae
Chamaea fasciata - Wrentit

Family: Laniidae
Lanius ludovicianus - Loggerhead Shrike

Family: Sturnidae
Sturnus vulgaris - Starling

Family: Vireonidae
Vireo huttoni - Hutton's Vireo

Family: Parulidae
Wilsonia pusilla - Wilson's Warbler

Family: Icteridae
Molothrus ater - Brown-headed Cowbird
Euphagus cyanocephaolus - Brewer's Blackbird

Family: Fringillidae
Passerince amoena - Lazuli Bunting
Spinus tristis - American Goldfinch
Amphispiza belli - Sage Sparrow
Melospiza melodia - Song Sparrow
Carpodacus mexicanus - House Finch

Mammalia - Mammals

ORDER: Marsupialia - Marsupials

Family: Soricidae
Sorex ornatus - Ornate Shrew
Notiosorex crawfordi - Desert Shrew

Family: Talpidae
Scapanus latimanus - Broad-footed Mole

ORDER: Chiroptera - Bats

Family: Phyllostomatidae
Choeronycteris mexicana - Long-nosed Bat

Family: Vespertillionidae
Myotis yumanensis - Yuman Myotis
Myotis volans - Long-legged Myotis
Myotis californicus - California Myotis
Eptesicus fuscus - Big Brown Bat
Lasiurus borealis - Red Bat
Lasiurus cinerus - Hoary Bat

Family: Molossidae
Tadarida macrotis - Big Free-tailed Bat
Eumops perotis - Mastiff Bat

ORDER: Rodentia - Rodents

Family: Heteromyidae
Perognathus californicus - California Pocket Mouse
Dipodomys agilis - Agile Kangaroo Rat

Family: Cricetidae
Peromyscus boylii - Brush Mouse
Peromyscus maniculatus - Deer Mouse
Microtus californicus - California Vole

Family: Muridae
Rattus rattus - Black Rat

ORDER: Carnivora - Carnivores

Family: Mustelidae
Spilogale putorius - Spotted Skunk
Mephitis mephitis - Striped Skunk
Mustela frenata - Long-tailed Weasel

ORDER: Artiodactyla - Even-toed Mammals

Family: Cervidae
Odocoileus hemionus - Mule Deer

PERSONAL COMMUNICATIONS

Hunt, James B. - Environmental Management Specialist, Office of Environmental Management, County of San Diego

Moran, Reid, Ph.D. - Curator of Botany, San Diego Museum of Natural History

Stuck, Charles D. - Assistant Civil Engineer, Department of General Services, County of San Diego

Witham, Helen V. - Associate Curator of Botany, Museum of Natural History

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COUNTY OF SAN DIEGO

PUBLIC WORKS AGENCY

COUNTY ENGINEER DEPARTMENT

ARCHAEOLOGICAL SURVEY

FOR THE PROPOSED

PALOMAR AIRPORT MASTER PLAN

PROJECT NO. UJ0089

PREPARED FOR: AIRPORT OPERATIONS DIVISION

PREPARED BY:

Gary R. Fink

Gary R. Fink
Archaeologist
San Diego County Engineer Department

September 11, 1974

TABLE OF CONTENTS

INTRODUCTION

An archaeological site survey for the proposed Palomar Airport Master Plan was conducted on August 19, 26, 29, and September 3, 1974 by Gary R. Fink, archaeologist with the San Diego County Engineer Department. The survey of the 480-acre parcel of land was done for the Airport Operations Division. A more in depth breakdown of the method of survey used may be found in a later section of this report.

Palomar Airport is located approximately thirty miles north of the city of San Diego, California, and about four miles south of Carlsbad, California. The Pacific Ocean is about five miles to the west with the city of Vista, California, located five miles to the east.

The purpose of the survey was to locate, record, photograph, and evaluate any archaeological and/or historical remains encountered in the field. A report, such as this, is then written describing and evaluating any such resources discovered.

The results of the survey were positive, with two archaeological sites discovered within the boundaries of the proposed Palomar Airport Master Plan. In addition, eleven archaeological sites are located in the immediate vicinity of the project area. Recommendations for mitigating the loss of archaeological and/or historical resources as prescribed by the National Environmental Policy Act of 1969 and the California Environmental Quality Act of 1970 are contained within this report.

PHYSICAL AND BIOLOGICAL ENVIRONMENT

The Palomar Airport Master Plan area consists of a series of marine Pleistocene terraces with numerous steep sided canyons and ravines cut between them (Sherrod 1973: 1). The principle drainage is Agua Hedionda Creek, part of which flows through the project area, and Agua Hedionda Lagoon, a mile and a half to the northwest. Four ponds may be found either within or around the boundaries of the Master Plan area (See maps in Attachments).

Of the approximately 480 acres examined, the majority was undisturbed and in its native state. Only the area immediately surrounding the airport, disturbed during the initial construction of airport facilities, and an area which has been farmed to the north of the airport, have been physically altered by recent man. This comprises about forty percent of the project area. Vegetation of the coastal sage scrub community make up the remaining undisturbed portions of the property. Species typical of coastal sage scrub communities such as chamise, California sage, lemonade berry sumac, prickley pear cactus, Spanish dagger, oak (both Quercus dumosa and Quercus agrifolia), sycamore, and laurel sumac abound in this undisturbed area. Also observed were cattail, bulrush, buckwheat, and white sage. Fauna observed included numerous hawks, a roadrunner, both cottontail and jack rabbits, several frogs and lizards, and ground squirrels. (Welker and Brimm: 1974) Any or all of the above biological resources could have been used by a sizable aboriginal population, assuming a similar environment in prehistoric time. (Bean and Saubel: 1972)

CULTURAL HISTORY:

ARCHAEOLOGICAL PERSPECTIVE

Archaeologists have defined three rather distinctive cultural patterns in San Diego County at the present. Material remains of the San Dieguito, La Jollan, and Kumeyaay (Diegueño) culture groups have been identified in connection with man's cultural history for the San Diego region. Since the exact chronology and cultural characteristics of each of the culture groups have not been clearly defined as of yet, the generalized descriptions which follow may be subject to periodic revision.

The earliest inhabitants of the San Diego County area were the Paleo-Indian group known as the San Dieguito. Available evidence indicates that they were primarily hunters and practiced a nomadic way of life approximately 12,000 to 7,500 years before the present. (Rogers 1966: 140; Warren and True 1961). Their material culture (physical remains) consist of numerous types of scraper and scraper planes, knife blades, large projectile points, and large stone tools. Burial practices of the San Dieguito people are unknown.

Based upon certain archaeological data, the San Dieguito people have been integrated into three major divisions: San Dieguito I, San Dieguito II, and San Dieguito III.

San Dieguito I, the oldest of the three phases, is prevalent in eastern San Diego County; however, it has not been found west of the Peninsular Range of Southern and Baja California (Rogers 1966: 179). Rogers encountered fifty-two sites of the San Dieguito II phase in

western San Diego County. (Rogers 1966: 179-184). The final phase of this complex, San Dieguito III, is equally well represented in the County.

The La Jollan culture, the second of the three major culture groups, are distinguished from the San Dieguito culture group by a major change in subsistence patterns. "They were seed grinders and seafood gatherers, more than hunters . . ." (Rogers 1966: 8). The presence of numerous manos and metates (grinding implements) in addition to quite extensive shell middens (darkened or discolored soil caused by prolonged human activity in one general area) have been noted in conjunction with La Jollan type sites. Lithic technology remained relatively the same, with only minor improvement, if indeed any at all, in tool refinement. Burial was by inhumation in the flexed position. The La Jollan Complex lasted from approximately 7,500 years before the present until about 1,000 years ago. Both the La Jollan and the San Dieguito Complexes lacked pottery. Sites resembling the La Jollan pattern have been found only on the coast, whereas San Dieguito sites are found throughout the County. Recently, it has been theorized that inland sites resembling the characteristics of the La Jollan Culture may be representative of the Pauma Complex (Warren 1961).

With the appearance of the Yuman speaking Kumeyaay (Diegueño) some time prior to 1,000 B.P., a change in subsistence patterns was again employed. A combination of a hunting and gathering economy was practiced by the Kumeyaay, who brought with them ceramics known as Tizon Brown Ware, finely worked projectile points and stone tools, and disposal of the dead by cremation. Numerous bedrock mortars, metates, and manos,

all connected with a partial grinding economy, have been found at known Kumeyaay sites. These are the people whom were encountered by the early Spanish explorers and were subsequently dubbed the "Mission Indians."

About the same time the Kumeyaay ventured to the San Diego region, other groups of people also migrated here from different areas. Among these are the Luiseño, Cupeño, Cahuilla, and Gabrielino, all of whom were of the Shoshonean linguistic background. (Krober 1925). Although they spoke a language different from the Kumeyaay, material culture of these groups was remarkably similar. Differences have been noted in their ritual activity in recent ethnographic studies of these particular groups (Barrows 1900; Dubois 1908; Gifford 1918; Strong 1929). The Luiseño inhabited coastal northern San Diego County, the area in which the survey was conducted.

Archaeological remains found in San Diego County can be expected to fall into the above general cultural patterns.

CULTURAL HISTORY:

HISTORICAL PERSPECTIVE

Aside from sporadic visits of early Spanish sailing ships in the sixteenth and seventeenth centuries, the geographical area in which the Palomar Airport Master Plan is situated was not traversed by white men until an expedition led by Gov. Gaspar de Portola visited here on July 17, 1769. Fra. Juan Crespi kept a diary of the journey and called the area Santa Sinforosa; members of the party, however, evidently did not agree with that name, as they dubbed it Agua Hedionda, freely interpreted as "stinking water." This stigma was given the area apparently due to the euthrophication cycle of the nearby lagoon. The path which they followed was subsequently used by other travelers up and down the coast and it became known as El Camino Real. Both names, Agua Hedionda and El Camino Real, persist to the present day.

With the establishment of Mission San Luis Rey de Francia in 1798, located about nine miles north of the Palomar Airport Master Plan, the area began a slow development process. The padres of the mission were involved in a great many activities, and are credited by William S. Kelley, former owner of the area, as having "built a dam in Los Monos Canyon (Kelley ND)." This is only about a mile north of the proposed Palomar Airport Master Plan along Agua Hedionda Creek.

The mission period of California history ended and another period began, that of the rancho era. Agua Hedionda Rancho, containing some 13,311 acres, was granted to Don Juan Maria Marron in 1842. It extended inland almost to the present City of Vista from the Pacific Ocean, and

south to Batiquitos Lagoon. Several adobe houses were built by members of Marron's family during this time, and one or two still endure today after extensive restoration. Marron died in 1853 and by 1860 his estate was leased to Francis Hinton. By 1865, Hinton assumed ownership of the property. When he died in 1870, he willed Agua Hedionda to Robert Kelley. Kelley was a prominant figure in the Jamacha Rancho prior to this time. Upon his death in 1890, the rancho was given to his nine nephews and nieces who subsequently divided up the land. Descendants of the Kelleys still live on parts of the property, although much reduced in size. (Rush 1965: 89-90).

The majority of the area around the Palomar Airport Master Plan has been utilized since then primarily for cattle grazing and agricultural purposes. Clay mining operations occured in the recent past about a mile north of the project. (Sherrod 1973: 2).

SURVEY PROCEDURE

The field survey was arbitrarily divided into six separate geographical sections, each surveyed with varying degrees of thoroughness.

The area to the east of the airport and east of El Camino Real is designated as Clear Zone for the proposed Palomar Airport Master Plan. It is comprised of a total of 234 acres, the majority of which is undisturbed coastal sage scrub chaparral vegetation. It was divided into two distinct parcels, the southerly parcel comprising 183 acres, the northern parcel approximately 51 acres. The southern 183 acres had been field examined previously in February, 1974. This thorough archaeological survey disclosed the presence of one archaeological site (W-521), located within the boundaries of the proposed Clear Zone of the Palomar Airport Master Plan. A copy of the earlier report is on file with the San Diego County Engineer Department, telephone 565-5851. For further clarification of the geographical units, see the appendix of this report.

The northern 51 acres of the Clear Zone area were only spot checked for this report, due to lack of time and financial resources. One archaeological site, W-310, is located within the boundaries of this parcel of land. Neither archaeological site should be affected by this proposed project, since both are located in designated Clear Zone.

The area immediately north and west of the airport runway, about 60 acres, was surveyed thoroughly on foot in a series of transects. Most of this area had been disturbed during prior runway construction. No archaeological remains were located within this parcel.

The area adjacent to this and to the north is comprised of approximately 140 acres. It was surveyed by a series of transects and

revealed no signs of archaeological resources within its boundaries. Approximately 60 percent was under cultivation, the remainder in its natural state. Certain areas to the north and west of this parcel were also examined (See maps in Attachments).

Directly east of the airport is the existing North County Landfill. For obvious reasons, this area was not surveyed at all.

The last parcel of land to be considered is located south of the intersection of El Camino Real and Palomar Airport Road. It consists of 19 acres of extremely dense coastal sage scrub. Due to its considerable vegetative density, this area was spot checked only.

RECORD SEARCH

Records on file at the San Diego Museum of Man and the Anthropology Laboratory of San Diego State University were reviewed to determine the presence of any previously recorded archaeological or historical sites in the immediate vicinity of the project area. San Diego State University reported negative results. The San Diego Museum of Man indicated the presence of six previously recorded archaeological sites within or around the proposed Master Plan boundaries. Each will be described briefly below.

Archaeological Sites Off the Project Area

The first three sites are at a minimum one-half mile off the project area. Site W-122 is about one and one-half miles north of the northern boundary. It is a San Dieguito - La Jollan site with midden, a "reported burial and house pits ." (See attached Museum of Man letter - August 7, 1974.) It was originally reported in a survey for a proposed landfill and was determined to be of major significance (Fink 1973: 11). Site W-124, two miles northwest of the northern boundary, is likewise a a multi- component San Dieguito - La Jollan site. Site W-123, a combination La Jollan - Luiseño site, is found in a canyon bottom one-half mile to the north of the project boundary. All three sites, although close to the project area, are sufficiently far away as to not be affected by the Master Plan as it is now designed.

Archaeological Sites Adjacent to or Within the Project Area

Site number W-128 lies adjacent to the western boundary about 500 feet to the west. It is described as a "highland accretion midden with cobble hearths and bedrock metates." (See attached Museum of Man letter - August 7, 1974.) Depending upon specific plans for that section of the airport project, this site could suffer indirect impacts. These will be discussed in following sections.

The last two sites fall within the project area. Site number W-310 is reported as having indications of all three cultural complexes found in San Diego County (San Dieguito, La Jollan, Luiseño). It is a "coastal valley creek terrace midden with hearths." (Museum of Man letter, August 7, 1974.) Site W-521 is a La Jollan knoll top campsite of moderate significance. Both of these sites are located east of El Camino Real in an area designated as Clear Zone. As such, they are in an area that will not be developed and should not suffer any impact from this project.

Regional Archaeological Studies

Regional archaeological studies of the surrounding area indicate that the Palomar Airport region is one which has been investigated extensively for archaeological resources. An archaeological survey conducted by Richard L. Carrico in November, 1973, revealed the presence of ten additional archaeological sites in the immediate vicinity (Carrico 1973: 2-4). The area surveyed by Mr. Carrico consisted of approximately 600 acres, the western boundary of which runs contiguous to the eastern boundary of the Clear Zone area of Palomar Airport.

Of the ten sites recorded on that survey, six are relatively close to the Clear Zone but should not be affected.

An archaeological survey done for the Sycamore - Melrose Drive Extension, directly east of Mr. Carrico's project, recorded one archaeological site in addition to three previously recorded sites in the vicinity (Fink 1974). Due to their relative distant locations, none of these sites will be affected by the implementation of this project.

Two other archaeological surveys, one for the Letterbox Canyon Landfill (Fink 1973), another for the Palomar Airport Road Landfill (Fink 1974), added two more archaeological sites in the vicinity. Both of these sites have been discussed in previous paragraphs, (they are sites W-122 and W-521).

An archaeological survey for the Palomar Airport Industrial Park, a private development south of the airport, recorded four archaeological sites of minor significance. The archaeologist's report indicated that they were all La Jollan campsites (May 1973).

A clarification of the archaeological sites in the vicinity of the Palomar Airport Master Plan are included in the section Environmental Impact of the Proposed Action, along with cultural associations, significance, and expected impact upon the sites in question.

ARCHAEOLOGICAL RESOURCES

Two archaeological sites previously undiscovered were found on the survey for the Palomar Airport Master Plan. Each will be discussed briefly below:

Site CE # 44

The site may be located on the USGS San Luis Rey 7½" Quadrangle, Township 11 South, Range 4 West, Section and quarter Section not available. The site is found in a wide canyon bottom at an elevation of about 100 feet. Areal extent of the site is approximately 1500 x 1000 feet. Agua Hedionda Creek flows fifty feet to the west.

The site is located on private property about one-half mile north of the western edge of the proposed Clear Zone for Palomar Airport. It is bisected by Sunny Creek Road and is one-half mile southeast of the intersection of El Camino Real and Sunny Creek Road.

Noted on the surface of the site was an abundance of shell, primarily of the pecten and chione species. Soil was a light gray midden, with rodent holes indicating at least eighteen inches of depth. Artifacts observed were manos, tools, and flakes. No artifacts were collected.

Because the site contains characteristics of the La Jollan Culture group, it has been assigned as a La Jollan site, possibly a village site. At this point, significance of the site ranges from moderate to major. Further investigation of the site is deemed a necessity to aid in the determination of its significance. It is not within the scope

of this project, however, to conduct further investigation, since the site will not be impacted by this proposed project due to its distance from it. See maps in Attachments for the location of this site.

Site CE #45

Located in Township 11 South, Range 4 West, Section and quarter Section not available on the USGS San Luis Rey 7½" Quadrangle. The site is on a small knoll top, elevation 260 feet, and is 500 feet northeast of site number W-128. Palomar Airport is approximately 1200 feet southeast of the site.

The site consisted of scattered mano fragments, tools, flakes, and shell, with a thinly scattered midden which appears to have little or no depth. It resembles the La Jollan site pattern, and was, from surficial indications, used as a campsite. It is from moderate to minor in significance. Due to its proximity to the project's northwestern boundary, it could possibly be affected or impacted by it. See Mitigating Action.

EVALUATION OF THE SIGNIFICANCE OF THE AFFECTED RESOURCES

Agua Hedionda Lagoon and its immediate environs offer the archaeologist the rare opportunity to study the subsistence patterns of a little known people - the La Jollan Culture. Opportunities to gain insight into the San Dieguito and Luiseño culture groups are present at several sites, although on a much smaller scale. Of the numerous sites present in the Palomar Airport area, however, only four sites might be affected by the implementation of the proposed Master Plan. These are sites W-128, W-310, W-521, and CE #45.

Site W-128 is of moderate significance, but is outside of the boundary of the project. Site CE #45 is of minor to moderate significance and also lies outside of the northern boundary of the project. Site W-310, of moderate significance, and Site W-521, of moderate significance, both are within the area designated as Clear Zone for the Master Plan area and will be discussed more fully later.

RESEARCH POTENTIAL

Both individual and regional site potential appear to be extremely high, but since none of the area sites will be affected, no attempt will be made to ascribe any degree of importance to them.

ENVIRONMENTAL IMPACT OF THE PROPOSED ACTION

Since there are numerous archaeological sites in the immediate vicinity of the proposed Palomar Airport Master Plan, the impact upon each will be discussed below along with cultural associations and determination of significance:

Site Number

W-124 San Dieguito II, La Jollan II; moderate significance; will not be affected.

W-122 San Dieguito II, La Jollan II; critical significance; will not be affected due to its distance from the project.

W-123 La Jollan I-II, Luiseño; moderate significance; will not be affected due to its distance from this project.

W-128 La Jollan I-II, Luiseño; moderate to major significance; could be indirectly impacted as it is located near the western boundary of the Master Plan area.

W-310 San Dieguito II, La Jollan II, Luiseño; moderate significance; lies within the proposed Clear Zone for the Master Plan but should not be affected since the area will not be developed.

W-521 La Jollan II; moderate significance; lies within the proposed Clear Zone for the Master Plan but should not be affected since the area will not be developed.

CE #44 La Jollan II; major significance; will not be affected due to its distance from the project.

CE # 45 La Jollan II; minor significance; could be indirectly impacted as it is located near the western boundary of the Master Plan area.

AK-1 Luiseño; minor significance; will not be affected.

AK-2 San Dieguito II-III; major significance; will not be affected by this project.

AK-3 San Dieguito, La Jollan; insignificant; will not be affected.

AK-7 Luiseño; insignificant; will not be affected.

AK-8 San Dieguito, La Jollan; Luiseño; critical significance; will not be affected.

AK-9 San Dieguito II, La Jollan II; moderate significance; near the Clear Zone area, but should not be affected by this project.

MITIGATING ACTION

For sites W-122, 123, 124, CE #44, AK-1, 2, 3, 7, 8, 9, no mitigating action is necessary at the present time for this project. If, however, current plans are changed, they should be re-evaluated as to the possible effects the change of plans might have on the integrity of each individual site. Mitigation is offered for four other sites, however:

(1) Site W-310 and W-521 are both located in the proposed Clear Zone area for Palomar Airport. As such, they will not be affected in any way, either directly or indirectly. However, if the Clear Zone area is to be rezoned in the future in a way such that the preservation of these sites is in question, they should be re-evaluated as to their potential and future dispensation by a qualified archaeologist.

(2) Site W-128 has the potential for being impacted indirectly in two ways - either by the influx of new people in the area, or by construction equipment to be used in the implementation of the Master Plan. It is recommended that an archaeologist be present when construction activities are in operation in this area to prevent the potential loss of valuable archaeological resources. The same holds true for site CE #45. If any further future mitigation is determined necessary as a result, it should be carried out upon the archaeologist's recommendations.

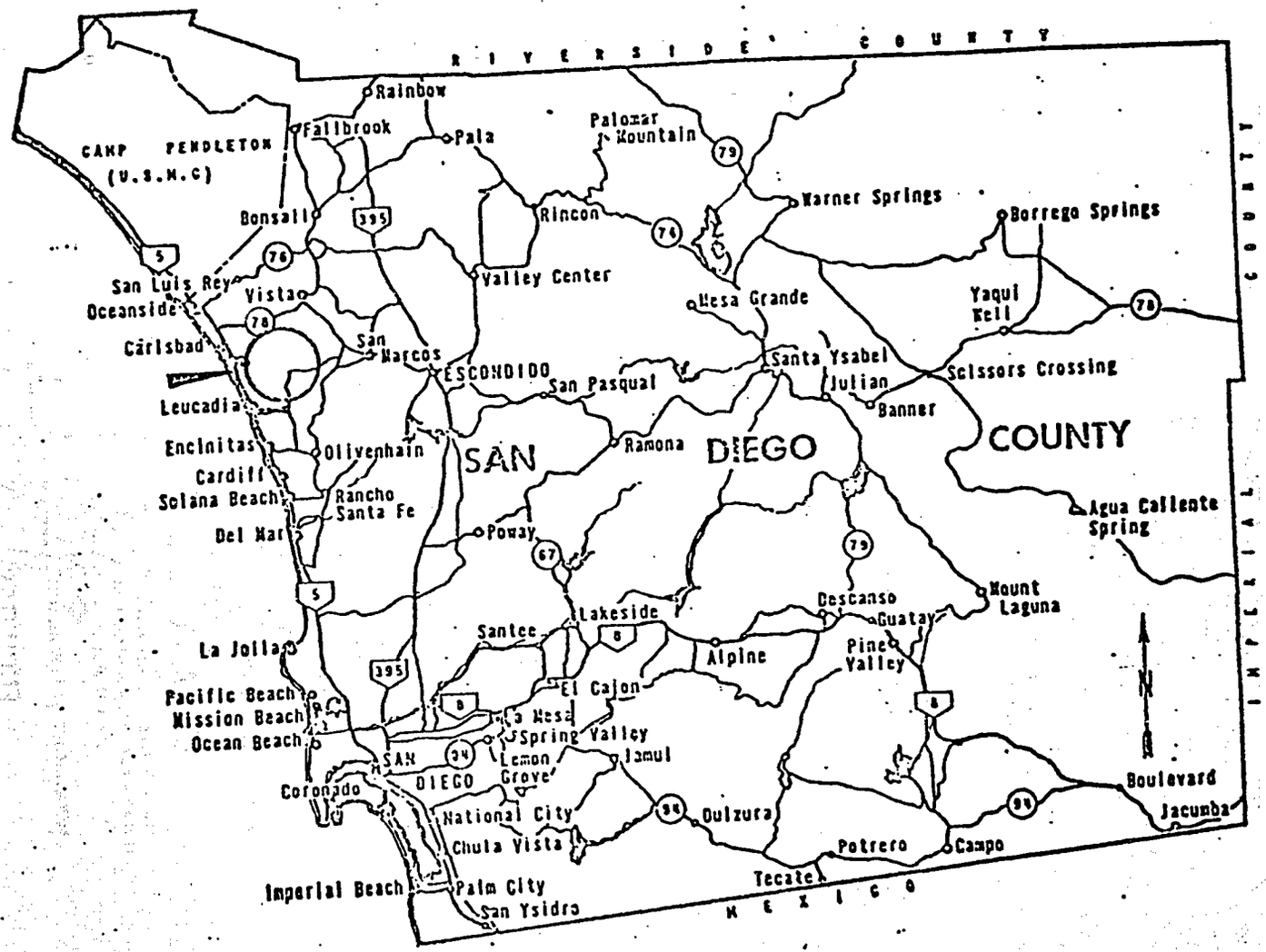
(3) Two areas were spot checked only due to lack of time and fiscal constraints. Should either area be slated for future development, they should be surveyed thoroughly by a qualified archaeologist prior to any earth moving activities. The areas are:

(a.) the northern portion of the Clear Zone area, encompassing approximately 51 acres;

(b.) the 19-acre parcel of land directly south of the intersection of Palomar Airport Road and El Camino Real; this should be surveyed at a time when a program of selective brush clearing makes it possible to adequately inspect the surface of the ground and should be done in conjunction with any such brush clearing.

See maps in the Attachments for further clarification.

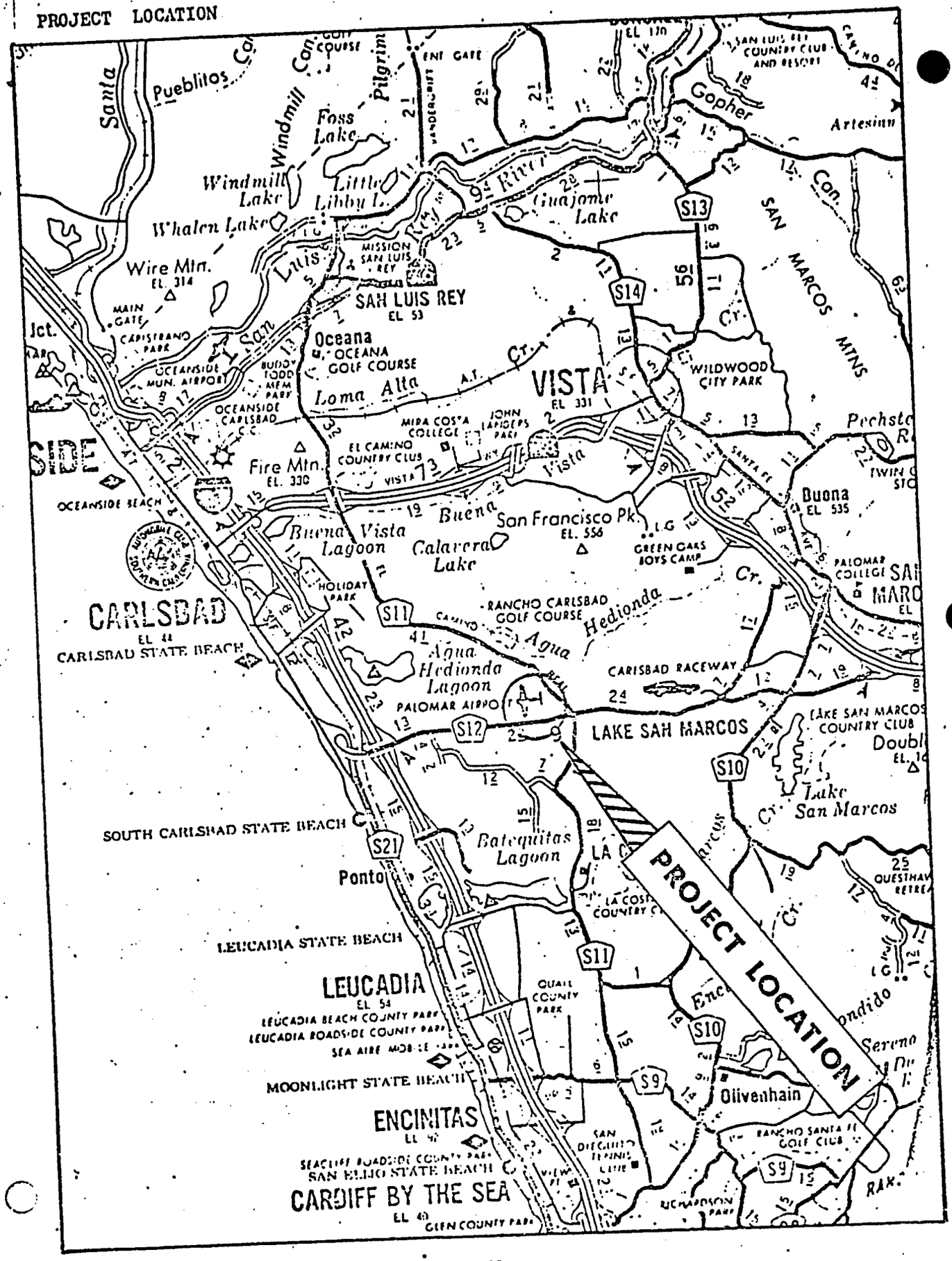
No additional mitigating action is necessary at the present. The new sites discovered will be recorded with the San Diego Museum of Man.

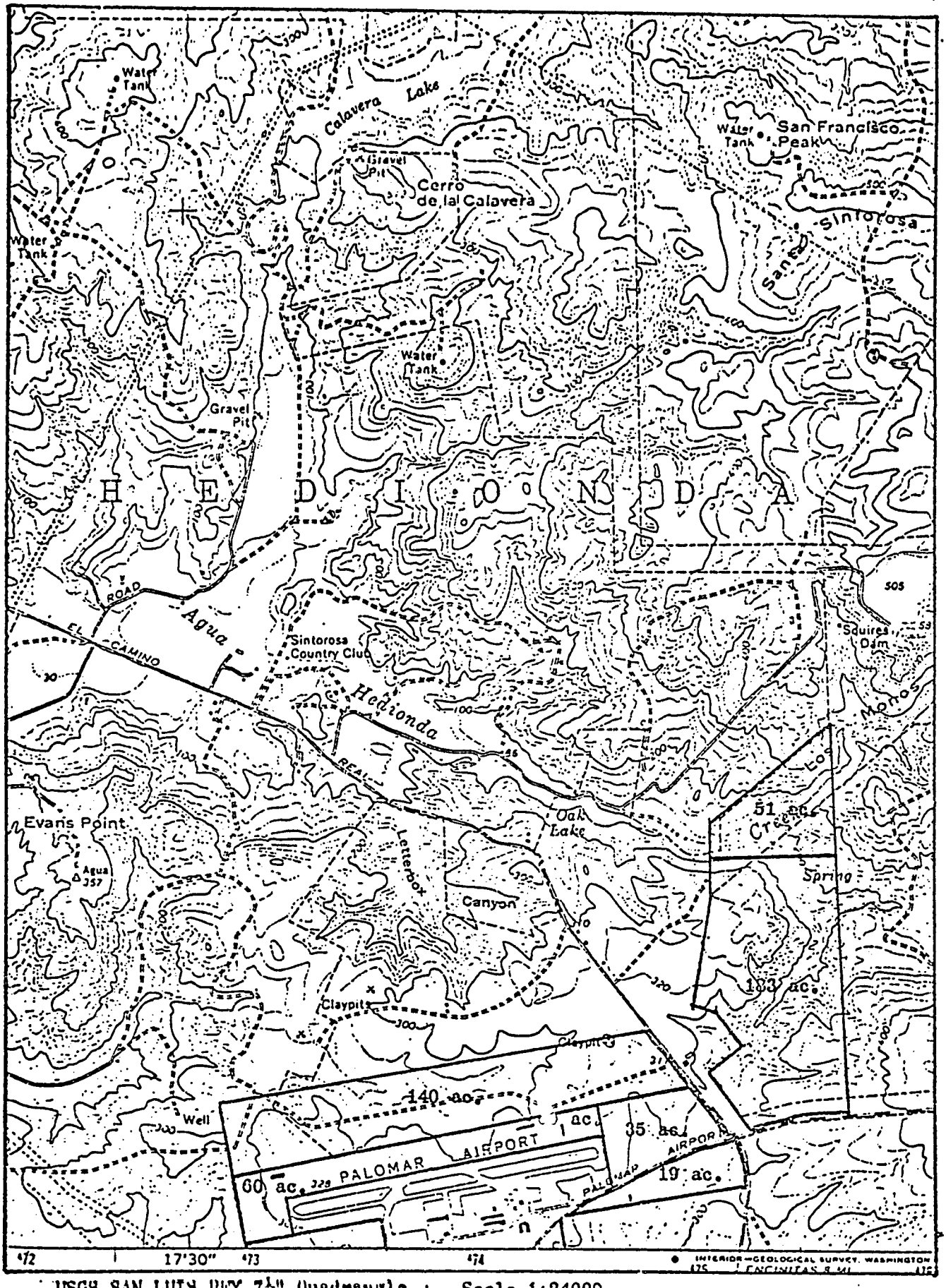


PROJECT LOCATION

ATTACHMENTS

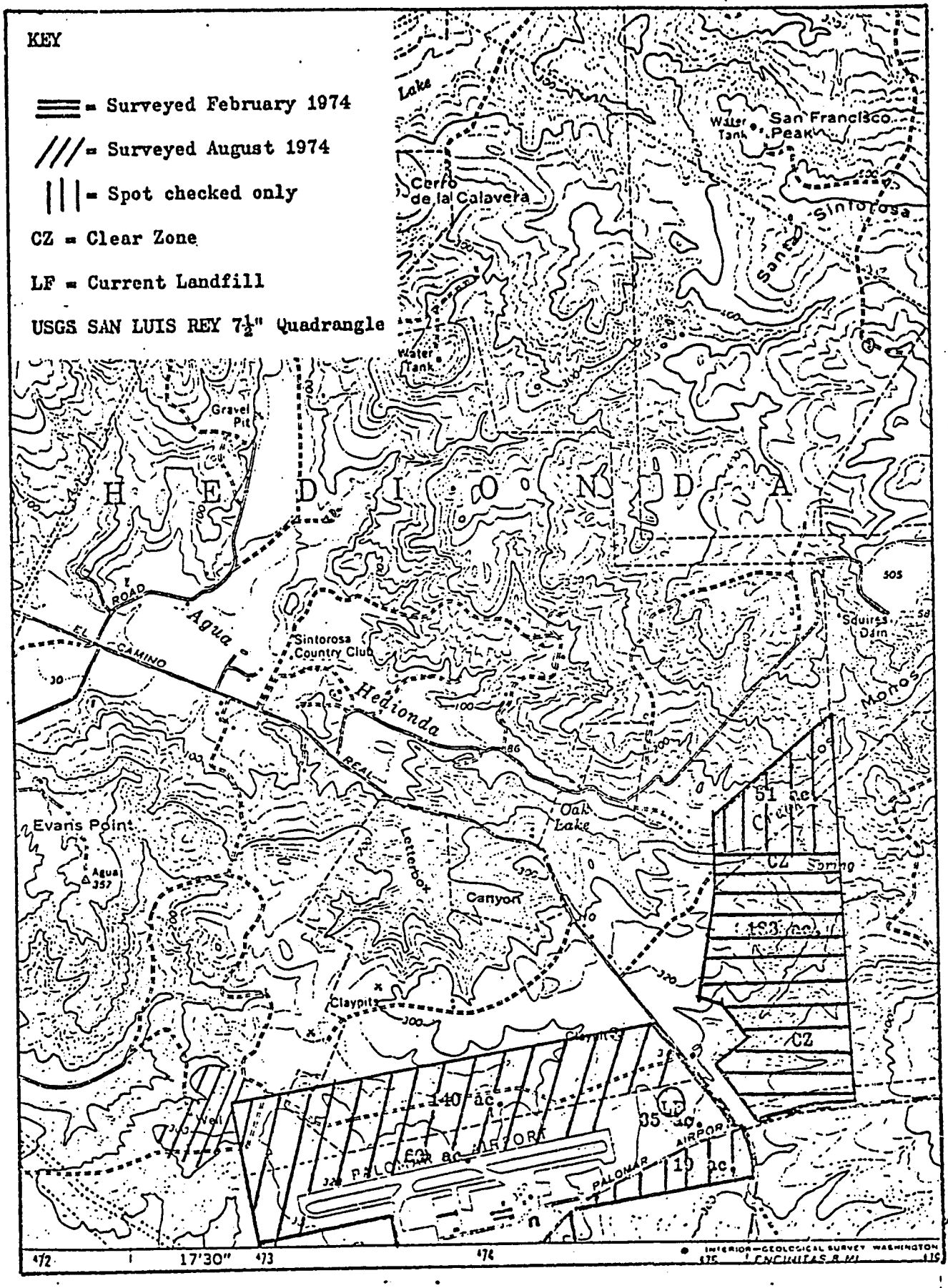
PROJECT LOCATION





USGS SAN LUIS REY 7½" Quadrangle · Scale 1:24000

PROJECT LOCATION AND AREA SURVEYED



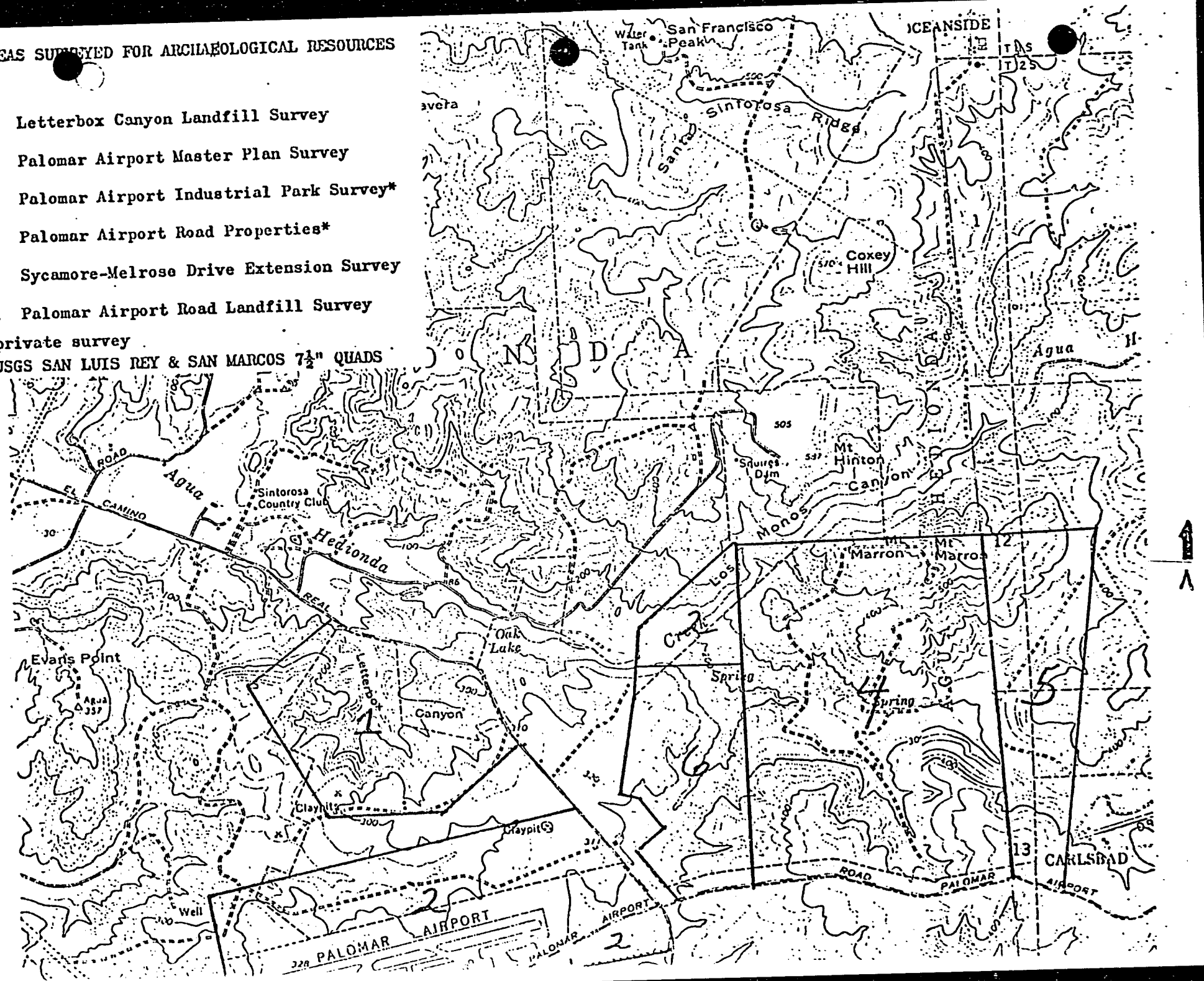
Scale 1: 24000

AREAS SURVEYED FOR ARCHAEOLOGICAL RESOURCES

1. Letterbox Canyon Landfill Survey
2. Palomar Airport Master Plan Survey
3. Palomar Airport Industrial Park Survey*
4. Palomar Airport Road Properties*
5. Sycamore-Melrose Drive Extension Survey
6. Palomar Airport Road Landfill Survey

*private survey

USGS SAN LUIS REY & SAN MARCOS 7½" QUADS



SITE FORM

(XX)SAN DIEGO STATE UNIVERSITY ( )SAN DIEGO MUSEUM OF MAN

SOURCE OF REQUEST County Engineer

DATE OF REQUEST August 14, 1974 DATE RECEIVED August 14, 1974

PROJECT TITLE Palomar Airport Master Plan

(X)THERE ARE NO RECORDED SITES IN THE PROJECT AREA IN OUR FILES

( )THE FOLLOWING SITES ARE RECORDED IN OR NEAR THE PROJECT AREA:

SITE _____

CULTURE: ( )SAN DIEGUITO ( )LA JOLLAN ( )KUMEYAAY ( )OTHER

COMMENT _____

TYPE: ( )VILLAGE ( )CAMP ( )MIDDEN ( )GRINDING STATIONS
( )ROCK ART ( )BURIAL ( )FLAKING STATION ( ) QUARRY
( )OTHER

COMMENT _____

SITE _____

CULTURE: ( )SAN DIEGUITO ( )LA JOLLAN ( )KUMEYAAY ( )OTHER

COMMENT _____

TYPE: ( )VILLAGE ( )CAMP ( )MIDDEN ( )GRINDING STATION
( )ROCK ART ( )BURIAL ( )FLAKING STATION ( )QUARRY ( )OTHER

COMMENT _____

August 14, 1974 Deborah Hofmeister

1350 El Prado, Balboa Park, San Diego, California 92101, Telephone (714) 239-2001

REPORT ON ARCHAEOLOGICAL SITE FILES RECORD SEARCH

Source of Request: San Diego County

Date of Request: August 5, 1974 (x)Letter ( )Telephone ( ) In Person

Date Request Received: August 7, 1974 (x)Map Received (x)Map Returned

Name of Project: Palomar Airport Master Plan

( ) The Museum of Man files show no recorded sites for the project area.

(x) The Museum of Man files show the following sites (x)within (x)in the vicinity of the project area.

Site No. W-122 Culture(s): San Dieguito II, La Jolla II

Description: Highland accretion midden; cobble hearths, reported burial and house pits

Site No. W-123 Culture(s): La Jollan I-II, Yuman III

Description: Slough margin midden in canyon bottom; cobble hearths, reported cremation

Site No. W-124 Culture(s): San Dieguito II (trace), La Jolla II

Description: Highland scattered camps; cobble hearths and platforms

Site No. W-128 Culture(s): La Jolla I-II, Yuman III

Description: Highland accretion midden; cobble hearths, bedrock metates

Site No. W-310 Culture(s): San Dieguito II (trace), La Jollan II, Luiseno

Description: Coastal valley creek terrace midden with hearths

Site No. W-521 La Jolla II - Knoll top campsite (recorded as County Engineer #16)

Please note: The project area may contain archaeological resources in addition to those noted above. This report is made from San Diego Museum of Man files only and may not include data pertaining to localities other than those covered in previous Museum of Man surveys or gathered by other institutions or by individuals.

Record check by: Ken Hedges

Date: August 7, 1974

Signed: Lowell E. English

AGENCIES AND ORGANIZATIONS CONSULTED

County of San Diego, Public Works Agency,
Environmental Services Unit

County of San Diego, Public Works Agency,
Airport Operations Division

County of San Diego, Office of Environmental Management,
Environmental Review Board

San Diego Museum of Man

San Diego State University, Anthropology Laboratory

Serra Museum Library

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1974 Comprehensive Land-Use Plan Palomar Airport. San Diego County Comprehensive Planning Organization, San Diego, California.

CONVERSION OF CNR TO CNEL

FOR PALOMAR AIRPORT

The method used to convert CNR to CNEL is the chart from "Aviation Noise Evaluations and Projections", San Francisco Bay Region by Bolt, Beranek, and Newman, Inc., August 1971.

Two charts are given. One with no nighttime operations and the other with 20 percent nighttime operations. Since this airport has only 0.5% nighttime operations, the first chart was used. For conversion, an average busy day operation of 1000 per day was used. This is the highest number given in the chart. The conversions are given below:

CNR	CNEL
80	54
95	65
100	68
115	81

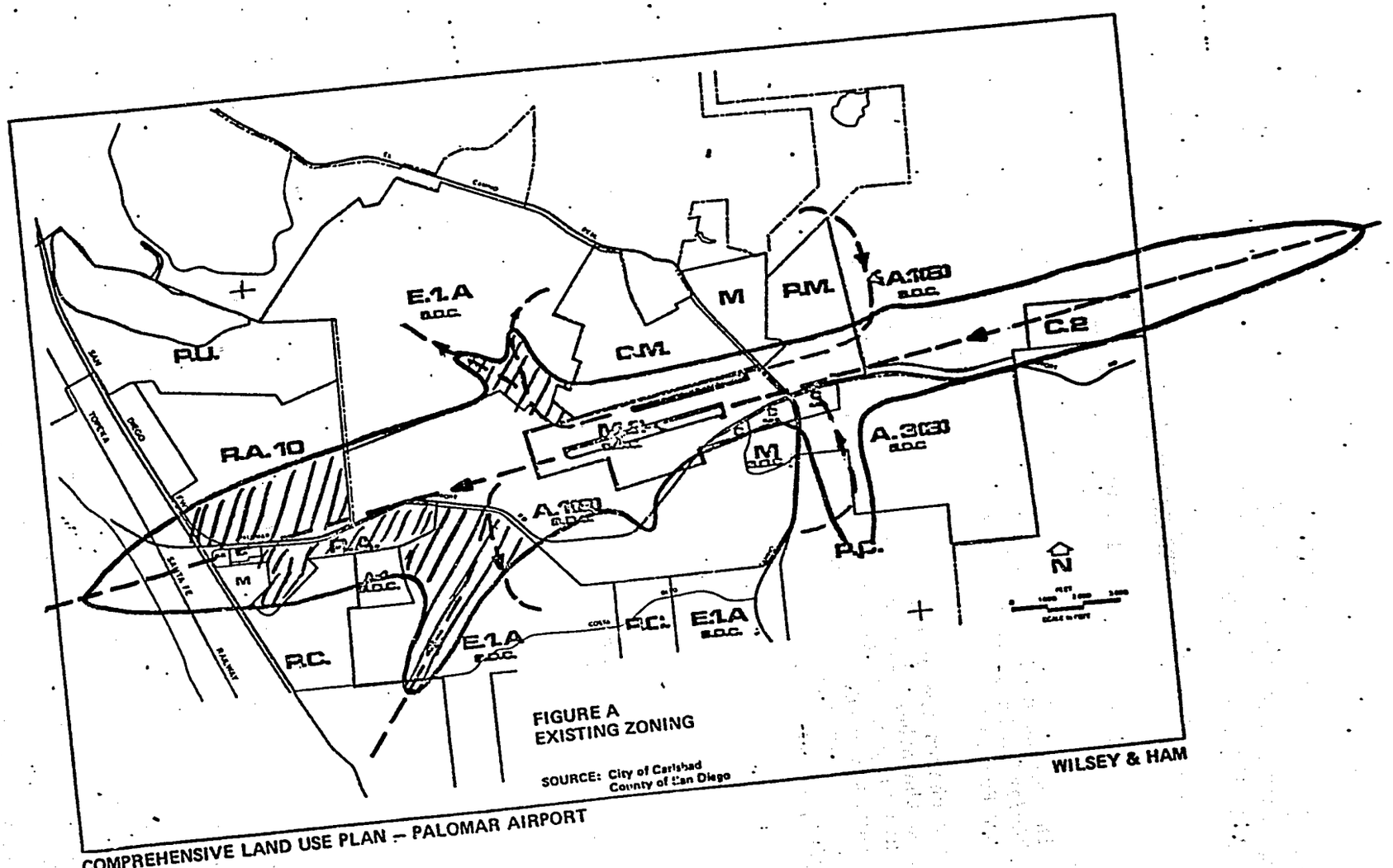


Figure 15. Palomar Airport 100--CNR Contour, 1990 Commercial buildings and agricultural lands within the 100-CNR (or 68-CNEL) line will have moderate to no conflict. Residences may have moderate to severe impact. Possible residential areas are marked in red.

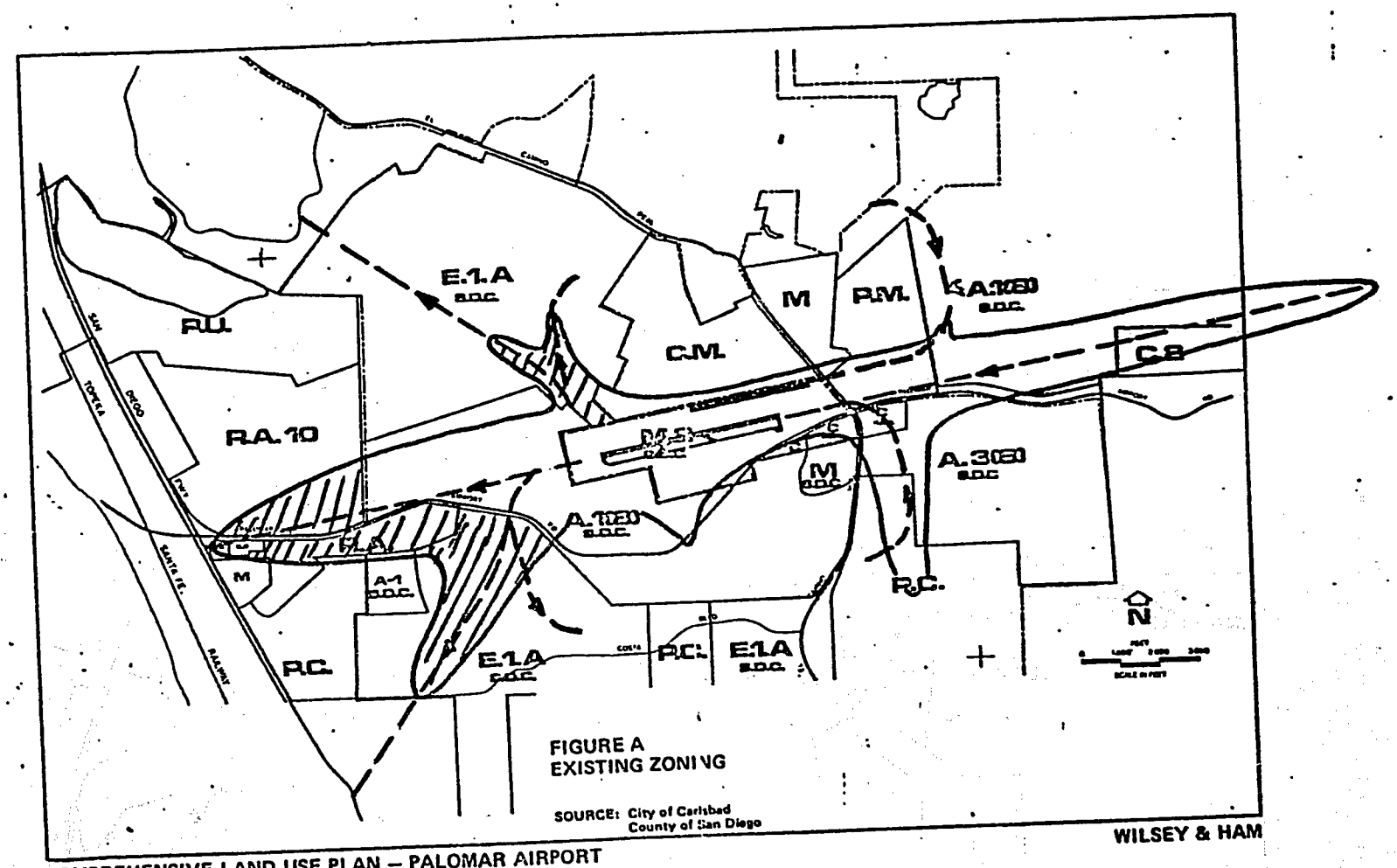
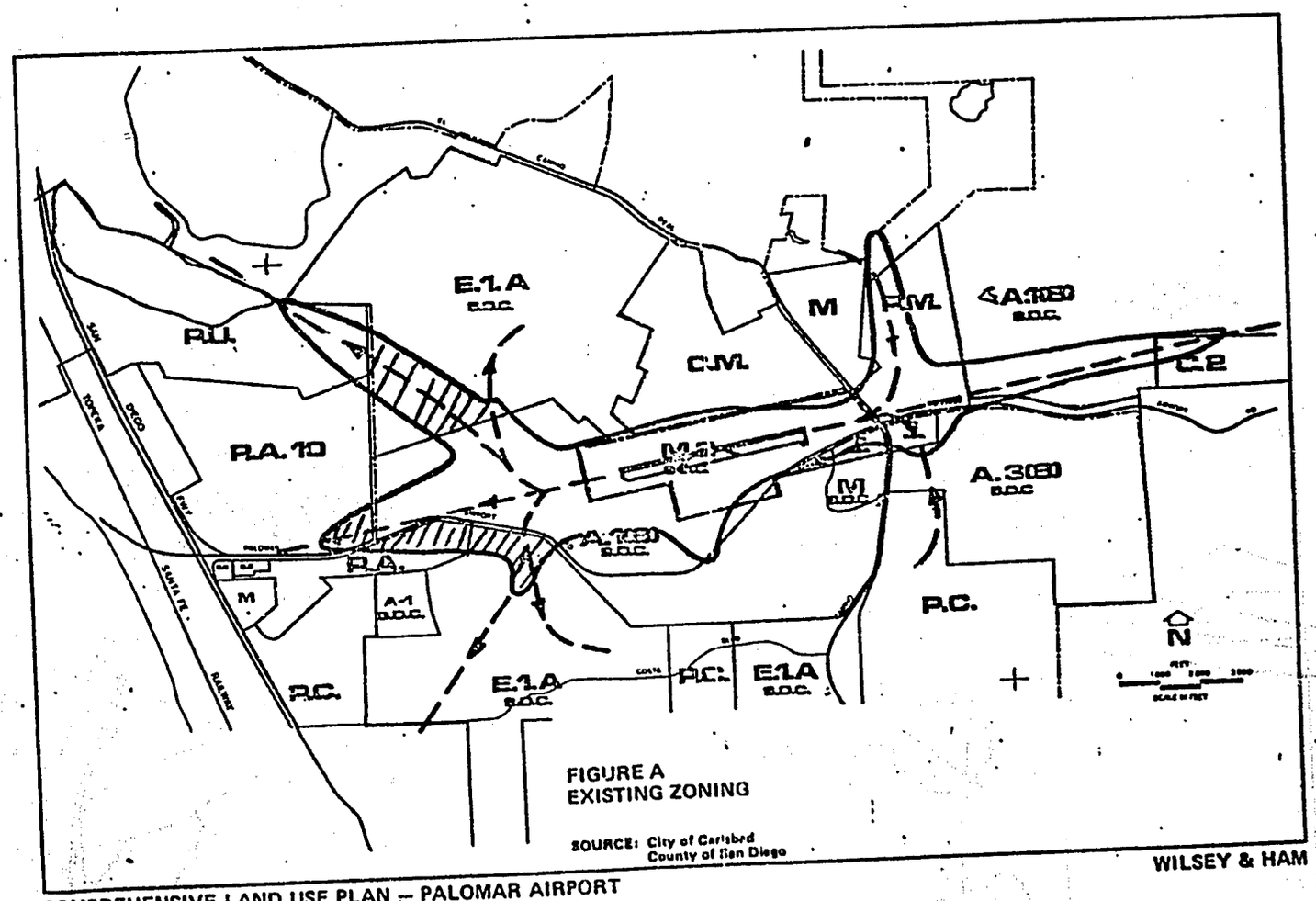


Figure 14. Palomar Airport 100--CNR Contour, 1980 Commercial buildings and agricultural lands within the 100-CNR (or 68-CNEL) line will have moderate to no conflict. Residences may have moderate to severe impact. . Possible residential areas are marked in red.



COMPREHENSIVE LAND USE PLAN -- PALOMAR AIRPORT

Figure 13. Palomar Airport 100--CNR Contour, 1975. Commercial buildings and agricultural lands within the 100-CNR (or 68-CNEL) line will have moderate to no conflict. Residences may have moderate to severe impact. Possible residential areas are marked in red.

COUNTY OF SAN DIEGO

PUBLIC WORKS AGENCY

COUNTY ENGINEER DEPARTMENT

ENERGY CONSERVATION REPORT

FOR

PALOMAR AIRPORT MASTER PLAN

W.A. UJ0086

Prepared By:

Jon Rollin

Jon Rollin
B. A. Mathematics

Richard Wolf

Dick Wolf
M.S. Aeronautical
Engineering

Report Dated: May 22, 1975

INTRODUCTION

The Master Plan for Palomar Airport presents modifications and improvements that will meet expected private aviation growth in the North County area. Because this is a Master Plan, final construction details of each phase have not been finalized and, accordingly, specific energy saving considerations cannot be listed. During development of the Master Plan, the designers can plan ahead for energy conservation in such things as building orientation, general landscaping and street placement. This Master Plan will control all major improvements at Palomar Airport until the year 1990.

The following are general energy-saving recommendations which might be implemented in any office buildings at Palomar Airport. Airplane hangers, however, would not need to meet energy-saving requirements because they are strictly weather-protection structures.

1. Uniform Building Code Standards

The State of California currently has only minimum design standards (Uniform Building Code - UBC) for commerical, industrial, and public structures. These standards are now being revised to include energy saving measures and will be implemented about January 1, 1976. They will deal with cooling and heating systems, ceiling and wall thermal design standards, tinted glass, floors and building design temperatures. These energy design standards will vary throughout different geographical areas within San Diego County. All buildings will have to meet the new standards. This industrial/commercial area is the only area at Palomar Airport that will have buildings subject to the UBC.

The importance of such standards may be seen when we realize that standards allow the designers, planners, and developers to make rational plans without over-designing. An over-design uses energy or material which may be used more effectively elsewhere. Lack of standards may result in under-design which must be either tolerated or corrected. Corrective action usually takes more energy and material than doing the job right in the first place. Therefore, specific, understandable, non-conflicting design standards should result in reduced expenditure of energy and material.

2. Detailed Specifications

Any detailed energy specifications should include the catch-all phrase "or equivalent" to allow for changing technology. A few years in the future, new forms of insulation and/or new building techniques may be devised which would render present day building standards energy wasting. To list energy conservation methods and imply they will be used five or ten years in the future is not realistic. By acknowledging that we live in a changing world, we will hopefully encourage designers and decision makers to examine new energy (and cost) saving procedures.

3. Economic Analysis

In the past, many projects have been analyzed on the basis of initial set-up cost only. Therefore a low initial cost gas hot water heater might be preferred over a high-initial cost solar hot water heater. Now, designers are beginning to look at life-cycle cost (which is flow of dollars over time, corrected for inflation and discounted for the cost of money). On this basis, a solar hot water heater often makes both energy and dollar sense.

This method of comparing alternatives according to their life cycle cost should be used by designers. Lowering the life-cycle cost (as opposed

to the installation cost) should lower the energy and material involved in the project. Another key to saving energy, then, is to encourage use of life cycle cost analysis methods.

4. Energy Consultants

Some developers equate a "Quick and Careless" design with a cost effective design. It might make sense to retain an energy expert to review plans on an advisory basis. Local and Federal officials regard Mitchell-Webb Associates, San Diego, California, as a source of expert advice. In an informal telephone conversation about Airport Master Plans, Bill Mitchell suggested 25 possible energy efficient items from fluorescent walk lighting and sodium street lighting to turf roofs. Some of these items will make sense for specific projects at specific times. Others will not. An energy expert could encourage more efficient designs.

5. Taxiways and Runway Turnoffs

Additional high speed and low speed runway turnoffs will reduce aircraft ground travel and will reduce peak hour takeoff, holding, and landing time. This reduces fuel consumption. However, excessive turnoffs and taxiways will not save fuel but will irrevocably waste cement or asphalt. The entire system has been carefully analyzed and will reduce consumption of fuel and material.

6. Airport Improvements

Several improvements to Palomar Airport are, by their very existence, energy conserving. Enlarged clear zones are areas where no permanemt buildings (and building related energy consumption) are permitted. Instrument approach systems and runway lighting modifications use electrical energy, but save airplane flight time and extra fuel expended going to an open airfield.

Fixed Base Operators (hangers, tie-downs, repair shops) can logically only exist near airports. The industrial/commercial area, by its location, will have nearby air transportation and freeway access. Shorter distances, in this case, will mean less fuel wasted hauling products.

CONCLUSION

The Palomar Airport Master Plan, by its very nature, is energy conserving. It is specific enough in layout design to eliminate energy consuming duplication of construction details. As an example, public utilities can be installed once, at maximum size, and eliminate energy wasting replacement to meet ultimate growth.

At the same time, the Master Plan is general enough to allow incorporation of energy saving techniques as they are perfected.

ENERGY RELATED CONSIDERATIONS - Bill Mitchell

Mitchell-Webb, Associates (232-7679), San Diego, California, May 15, 1975

1. Thermo pane windows.
2. Increased wall/roof insulation.
3. Building orientation.
4. Amount of glass.
5. Landscaping. (Ivy on walls actually acts as an insulation layer) - shade trees, etc.
6. Turf roofs.
7. High pressure sodium street lights.
8. Low pressure sodium street lights.
9. He has designed a 42-inch and 12-foot street/walkway light - low profile - vandal proof (walklight = 20 watts, street light = 60 watts)
10. Balance interior lighting on a task/need basis.
11. Balance and interface your electrical and air-conditioning systems and provide load shed capability.
12. Solar energy - many items
    a.) Consider life cycle cost vs. initial cost
    b.) New designs/projects usually can make better use of solar than patching into existing.
    c.) Hot water heater; space heating, energy converters.
13. Storing solar energy in eutectic salts/water.
14. Energy conservation is more than just adding a solar hot water heater; it is a system design. You must look at the entire physical space, life cycle cost, energy schedule.
15. Maintenance is important - (A jammed street light photocell can cost $30 per year - same amount for a time switch.)

16. Watch out for holes and openings that allow hot or cold air in or out.

17. There is HUD, DOD, AND ERDA money for energy related projects.

18. City of San Diego is looking at solar swimming pool heaters. Dave Wood may have other items, share items, etc.

19. Insulate heating/cooling ducts.

20. Use of gas powered aircraft engines to generate on site electricity (TWA has this type of installation at their base in Kansas City).

21. Building exterior material.

22. Wind mills.

23. Additional taxiways/turnoffs to reduce aircraft ground travel times and distances.

24. Don't over-design lighting, heating, or air conditioning.

25. Airports, due to their design profile, provide ideal conditions for the capture of tremendous amounts of solar energy and can provide 60% or more of the facilities total heating, cooling and hot water needs. This would be an ideal project to prepare a proposal for a government grant.

CORRECTION

To assure optimum legibility the preceding document and/or group of documents have been re-photographed and their images appear immediately hereafter.

COUNTY OF SAN DIEGO

Department of General Services

Central Records Service

County Operations Center, 5555 Overland Avenue, San Diego, California 92123

CRS 350 (11 74)

ENERGY RELATED CONSIDERATIONS - Bill Mitchell

Mitchell-Webb, Associates (232-7679), San Diego, California, May 15, 1975

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COUNTY OF SAN DIEGO

PUBLIC WORKS AGENCY

Department of County Engineer

DIVISIONS: Construction - Mapping - Surveying
Planning & Land Development
Engineering Services
Field Operations

R. J. MASSMAN
County Engineer

County Operations Center · 5555 Overland Avenue San Diego, CA 92123 .....Telephone 565-5177

September 8, 1975

TO: Environmental Review Board (0175)

FROM: Director of Transportation (0320)

SUBJECT: Palomar Airport

The recent Burger vs. Mendocino County court decision pointed out the necessity of considering social and economic benefits of environmentally adverse projects. Therefore, we are enclosing the following information about the Palomar Airport Expansion. The enlarged airport facilities will have an overall benefit by increasing safety, increasing the local tax base, and decreasing fuel use and travel costs. Our information shows that the current economic benefit of the airport to the region is about $4 million annually. The expected benefit after expansion will be around $7.6 million annually.

Please consider this additional information together with the environmental impact report so all information is available to the Environmental Review Board (ERB) and to the public. We ask that both reports be brought back to the ERB and that both reports be processed together in the future.

R. J. Massman

R. J. MASSMAN
Director of Transportation

RJM:KAL:jaw

Enclosure

PALOMAR AIRPORT EXPANSION
ECONOMIC JUSTIFICATION STATEMENT

I. INTRODUCTION

Palomar Airport's contribution to the society and economy of the northern sector of San Diego County is definitely positive. The expansion of the facility will cause the amount of economic activity to increase. Traditionally there have been a number of ways to view the economy in the area surrounding the airport. One way is to view the activity at the airport by how it benefits the citizens and organizations concerned with the project. This form of analysis, originally used by Peat, Marwick, Mitchell and Company for the Urban Mass Transit Transportation Administration, divides those involved into four broad categories: the User, the Non-User, the Community, and the Operator.

A. The User

The user can be defined as the individual or individuals actively using the airport and its facilities. The operator and users of the airport's businesses are also users of the facility.

The user benefits from Palomar Airport's expansion in the following ways:

- The prevailing concern for the user is safety both in selecting an airport to fly from and in his decision as to where he keeps his aircraft. The expansion of Palomar will meet the safety needs for the airport's users well into the 1990's. Lack of air congestion, sophisticated landing guidance equipment, more capacity to deal with emergency conditions, and emergency rescue and fire equipment all contribute to the safety of users.

- The addition of the second runway will provide for operational separation of larger and smaller aircraft. The two runways will allow simultaneous and separate instrument flight rules (IFR) and visual flight rules (VFR) training.

- The travel costs of the user will be reduced in several ways, ie., engine operation time for the aircraft, the amount of circling time and on ground waiting time, and the amount of aviation fuel used.

- As the airport becomes safer, insurance rates for the airport will decline.

- The airport will have more room to base aircraft and more space for transient aircraft, thus reducing the need to drive to other outlying general aviation airports. The increased capacity will attract specialized aircraft services, such as repairs, parts, fuel, reconditioning, new aircraft sales, etc. The facility will also allow greater air access to the expanding residential and commercial activities in the Palomar area.

- As tourism continues to grow in the north county this airport will become more important as a point of entry for the area.

- A recent estimate places the percent of business flights of general aviation aircraft between 50 and 68 percent of all flights. An expanded facility would increase the business growth rate in the area because many companies consider direct access to an airport a prime locational factor. The growth of corporate aircraft fleets tends to parallel the growth in business in the vicinity of airports.

B. The Non-User

The non-user can be seen as those individuals or groups that are directly influenced or impacted by the airport. These would include the residents and businesses that do not use the airport but live in the vicinity. There is no intensive residential development within a mile of Palomar Airport, the area most impacted by the airport.

The major benefits to the non-user include:

- The increase in safety at the expanded airport. When the potential for air collision is reduced the area surrounding the airport becomes safer place to live.

- The expanded facility will increase the emergency services available to the non-user. These services include: police aerial surveilance, air and ground fire fighting services, aerial supply and evacuation in the event of a disaster, a coordination and supply facility to deal with massive civil disturbances.

- The increase in property values as the airport draws industry into the airport's vicinity.

- The increase in industrial and commercial tax base, will have a resulting reduction in the tax burden upon the residential property owner.

- A new supply of jobs as the industrial area develops.

- The creation of a center of economic activity with separate and distinct land use, providing for the separation of industry and residential development.

- The potential to rapidly supply replacement parts for vital machinery, thus reducing costly delays in operation and production.

- The potential to move safely, small, high value or perishable shipments for industry and business thus broadening the scope of business in the area.

C. The Community

Probably the greatest benefit from an expanded airport is to the community. The community is the entire region served by the airport. Palomar services the northwesterly section of the County including the communities of Carlsbad, San Marcos, Vista, San Dieguito, part of western Escondido and southern Fallbrook and Oceanside.

The benefits to the community that result from an expanded airport are as follows:

- The airport will tend to serve as a focal point in concentrating industry and other compatible land uses in close proximity to the facility.

- The expanded airport will retain the economic activities that are already locating near the facility. The adjacent Cabot, Cabot and Forbes industrial park was designed to provide the best direct access to the entrance of the airport. Another consideration is that the businesses on the airport will not be drawn away to other airports in San Diego County or Orange County because of a lack of growth potential.

- Some examples of the types of business locating on or near the airport are: aircraft and aircraft parts manufacturers, air freight terminals, aviation schools, aircraft repair shops, aerial survey and mapping, and consultant services and firms.

- The ability of the larger airport to concentrate and retain a large variety of economic activities in a concentrated geographic space has led to a beneficial economic environment for the airport vicinity.

- Tourism, one of the County's largest industries, will be aided by the larger facility. At peak times of the year, for example during the La Costa golf tournament and the Del Mar races, the transient parking facilities of the airport as they now exist approach maximum capacity. As tourism in the north county increases this demand, airport use will also increase. The introduction of new money into the economic circulation system will result from greater tourist access to the region through the airport.

D. The Operator

The operator, the County of San Diego, will also benefit from the larger airport. Some of the benefits to the County are:

- Aid in making the facility safer to use and operate. All the other safety considerations mentioned above also apply for the County.

- The County's liability for operating the airport would be reduced as it becomes safer.

- The larger facility would have more of the noise impacts contained within its own boundaries thus eliminating the potential source of many citizen complaints.

- The larger facility would have more area for airport economic activities. This would reduce the economic burden on the citizens by the direct and indirect revenues produced on the airport, and reduce the net County cost of operating the airport. These revenues would include rents and concessions, landing and tie-down fees, and the tax revenues produced on the airport property.

- The resulting increase in jobs will have a favorable impact upon the County's unemployment rate.

- An expanded airport will aid the County in the effective management and operation of other County facilities. Aerial inspection of agricultural problems, rapid movement of staff to outlying areas, and aerial surveys, and photography are a few examples of this function.

- The economic activity generated by the expansion will increase the County's tax base and have a positive effect on the tax rate.

II. CONCLUSION

The overall result is that all four groups will benefit by the expansion of Palomar Airport. Based upon current airport data,

the economic benefit of the airport to the region is approximately four million dollars annually. This estimate is based upon the annual payrolls from the airport and applying a standard 2.5 multiplier. Based upon the other general aviation facilities in the County, the expected annual contribution from airport expansion will be an additional 3.6 million dollars. This estimate is based upon the SANPAT Report No. 4, April, 1973. Thus the total annual contribution to the local community will be $7.6 million after the airport is expanded. (See attached report on General Aviation Airport Systems.)

ATTACHMENT 2

POSITIVE VALUE OF A GENERAL AVIATION AIRPORT SYSTEM

Introduction

The economic impacts of general aviation airports are at best very difficult to accurately determine. "The lack of scholarly attention to general aviation is rather surprising when one considers its importance. This importance is substantiated by any conceivable measure one cares to make, whether number of aircraft, mileage or hours flown, passengers carried, landings and takeoffs or rate of growth."[1] To illustrate the scope of general aviation, 98 percent of civil aircraft in the United States are of general aviation type used by business firms and individuals for business and personal transportation flying.[2] According to Stanford Research Institute, "it is not possible to measure an airport's total economic benefits to the community in absolute terms, but certain specific types of benefits can be identified and perhaps quantified."[3] "Huge beneficial impact on the economy" was the way Harvey M. Ross, a budget analyst for the San Francisco Board of Supervisors, described the impact of the airport on the region.[4] This impact is felt across the nation. Fortune Magazine, in describing how smaller communities have come to realize the economic potential of their airports, states "small communities everywhere are begging the airlines to include them in their routes, recognizes that to be left without air service today is as detrimental to a town's development as being bypassed by the railroad a century ago."[5] The same can be said for the general aviation airport, in that large corporations are becoming more dependent upon general aviation due to its speed and flexibility of air transportation. And that the aviation activities "general employment that in turn generates the need for expansion of commercial business, personal and retail services in the vicinity."[6]

Impact Evaluations Systems for Semi-Quantifiable Data

A traditional procedure for determining impacts of economic activity on the region has been to use a jobs and income ratio. A report put out by the U. S. Chamber of Commerce says that for every additional 100 new jobs introduced into a region by the influence of a specific activity, annual retail sales increased at approximately $300,000 and 65 additional jobs (not including the original 100) were created.[7] William L. Pereira Associates in the proposed Master Plan Report for Palomar Airport used a "standard income multiplier of 2.5 to 1" in company income generated by the airport to the annual contribution to the County's economic activities.[8] The same procedure was used by Pereira in the Gillespie Field Master Plan accepted by the San Diego County Board of Supervisors.[9] A third procedure for determining economic impacts is by a passenger/employee ratio. For every 1,000 new air passengers approximately 1.5 employees positions are needed in the airport area.[10] From that point the employee's income procedure can be employed.

Probably the best and most accurate approach attempted was done by John N. Martin in an article for the Transportation Journal "Economic Impact of Airport Investment and Use in North Carolina." It was an extended study from 1958 to 1969 and used as a base the actual amounts of retail sales for the entire state. Counties served by general aviation and air carriers service were compared to counties without airport facilities, when other population and economic statistics were held constant. Martin concluded "in terms of the general level of economic activity, the impact of the airport investment and use is probably much too small, at least at the county subdivision level, to be identified and measured in any one year. Over a longer period, however, there appears to be a positive relationship between airport investment and economic growth. The payout of airport investment for North Carolina over the period tested, 1958-1969, equated to 3.8 percent of the total growth as measured by the change in retail sales per capital."[11]

Another procedure for determining the value of an economic activity in the region has been referred to as a "reputational type" method. The procedure consists of surveying the business and economic leaders in the area and asking their opinion as to the benefit to be gained or lost with the introduction or elimination of a particular activity in the region. This procedure was used in Lee B. Zink's study, "The Economic Impact of Airports," and also in the Federal Aviation Administration 1967 report, The Airport--Its Influences on the Community Economy. In this report they stated "at each location, community leaders considered the airport to be an important element for balanced community development."[12]

Industrial/Commercial Considerations

The airport can and does serve as a strong factor in the decisions that are made when a company decides to relocate its operations. "Over 80 percent of all major firms which were located within the metropolitan Washington, D. C., area considered access to an airport to be a high priority locational factor."[13] "The existence of an adequate airport was a strong factor in attracting new industries to each of the communities surveyed. Community leaders and the heads of many of the new industries that locate in the area have stated that the availability of air transportation was a strong factor in decisions to locate in these areas."[14] In a small size city in west Texas a good example of the process can be seen. "The airport was the factor that 'tipped the scales' in Herford's being chosen over similar locations in west Texas for construction of a Holly Sugar plant.[15] The locational aspects of the sugar plant and the other related development induced by the airport in this small community aided the goal, set by the civic leaders, of becoming a regional hub of economic activities serving a large hinderland. A general aviation airport serves as a catalyst and a nucleus for commercial and industrial expansion in the surrounding area. This means the attraction of new activities and the retention of existing ones. Airports can be the center for a large planned industrial

development area. Business and industrial concentrations can locate within a very few minutes drive to the airports. In small communities, the relatively short ground travel distance to all points in the local area have made it unnecessary to develop industrial areas next to the airports. However, because of the previously cited information, industry does tend to locate in the airport vicinity. Larger communities have, however, benefited by developing planned industrial districts on and about their airports. Airport-community accessibility was considered an important planning element by each of the communities surveyed. The speed and convenience of air transportation can be fully realized only when the airport is made directly accessible to business and industrial areas.[17]

The ability of the airport to concentrate and retain specific types of economic activities in a limited geographic space has led to a beneficial economic environment on the airport and in the near vicinity of the airport boundaries. An aspect of the economic activity in the area has been that "certain industries owned and managed by people who fly may tend to gravitate toward an airport location as a convenient way to maintain business contacts."[18] The proximity of a modern airport can be considered as an essential factor to the retention of many existing industrial establishments. "Over the years, air transportation has become increasingly more important to such companies by helping them to retain and improve their competitive positions in local, national, and international markets."[19]

When the benefits to industry and commerce near an airport are considered, the development of airport industrial parks becomes increasingly more desirable. "The future development of most general aviation airports should be financed from future airport surpluses; this will require the adoption of airport policies and pricing principles that will ultimately generate such surpluses. Organizing and administrating airports as systems will make it possible to achieve conditions of financial self-sufficiency."[20] If the airport is to be operated without a deficit and obtain the said financial self-sufficiency, the regular cost of operation and maintenance must be met by taking full advantage of all possible sources of revenue that would be available from an airport industrial park in combination with regular airport commercial activities. The industrial park could be located on airport land that is in excess of current needs.[21] There are a number of industrial and commercial activities which are attracted to and are compatible with airports. Such activities could include: aircraft and aircraft parts manufacturers; air freight terminals, trucking terminals, and other allied uses; aviation schools; aircraft repair shops; warehouses, aerial survey and other similar companies; aviation research and testing laboratories; airline schools; auto storage areas; parking lots; airport motels and hotels; restaurants; taxi and bus terminals;

wholesale distribution centers; gas stations and auto washing facilities; rental of office space; and other consultant services and firms; military production of equipment and parts; commodities like flowers, perishable foods, pharmaceutical, electronics, high value items, etc.; and concessions that relate to aviation activities.[22]

Also, the American Society of Planning Officials points out that in addition to the above uses, the airport area can be considered a desirable location for many other industrial and commercial activities which can take advantage of the passenger carrying capacity of the airport. They also recommend that special provisions "be made for the enhancement of such establishments in the form of industrial or office parks, combined as conditions permit, that would be of benefit not only to such businesses but to the entire metropolitan area.[23] As the SANPAT Study produced by the Comprehensive Planning Organization points out in reference to air transportation services, there has been important locational factors in stimulating local industrial and commercial development in the airports market area."[24]

"A continuing benefit of an airport to local industry that has been identified is its value in equipment maintenance programs. Air transportation has made it possible for key industries to keep equipment downtime to a minimum by the rapid replacement of supplies and parts, thus, reducing the need for a large parts inventory."[25]

The impacts of the airport system include the effects on business and commercial activities brought about by the availability of air travel. Joseph A. Foster reports, "Providing air access for business firms which must meet the demands of supply, competition, and expansion of marketing areas, the airport has become vital to the growth of business and industry in the community."[26] The ability to provide air service for the social and business interests of the economic community and to draw new economic activities into the area, depends to a great degree upon the access to the transportation networks of the country and the world.[27] "Air transportation has greatly facilitated the development of business and industrial operations of broad geographic scope by making it possible for technical and managerial personnel to visit scattered installations frequently and conveniently."[28] The use of aviation for business travel is increasing.[29] "The long-run is bright for airports and general aviation airports in particular. Business firms are getting larger and spreading their activities all over the country, even the world. Fast air transportation will be increasingly necessary for effective management."[30] Moreover, the nation and world-wide marketing of products has been greatly facilitated by air travel of marketing personnel."[31] All of these factors demonstrate the absolute need for a commercial region to have connections to the national air transportation

system. This system includes general aviation (98 percent of all civil aviation aircraft in the United States) and air carrier airports serving the country and the world.[32] The growth of commercial and business travel has been increasing. Accompanying this growth has been the growth of corporate air fleets. Both factors are reflected in a study done in 1959. Even though the data is dated, the trend is evident. "A study done of 67 corporations representing total assets of $226 billion indicates that air travel expenses amounted to $31.1 million (not including aircraft purchases), the impact on the operations of those firms is of course impossible to trace."[33]

Tourism is one of the largest industries in the San Diego Region and is considered as part of the basic industry by the Comprehensive Planning Organization.[34] General aviation contributes a large segment of the aviation activities coming into San Diego County. Many of the visitors at La Costa, near Palomar Airport, arrive by general aviation aircraft. As the expansion of the County's urbanized area occurs, the airports of the County airport system will play an increasing role in the growth of tourism. And as part of the tourist industry, San Diego has also a growing interest in the attraction of a larger percentage of the national conventions that are held. A "study done by the International Association of Convention Bureaus indicates that there has been a strong trend toward greater dependence in air travel by persons attending national conventions."[35] The economic benefits of those attending the conventions is difficult to directly track to aviation, but the impact is significant." Cities like Washington, D. C., which held numerous conventions, realize substantial net benefits from delegate expenditures."[36] As the SANPAT Study indicates "air tourist expenditures circulating quickly through the San Diego regional economy and generating much more 'induced' business activity than their initial amount" of expenditure.[37] Although the above aspects of tourism and convention attendance are more the result of air carrier than general aviation transportation in San Diego, it should be mentioned that there is an important impact on tourism from arrivals by general aviation aircraft. A large percentage of the general aviation movements are for business activities and of those that arrive from outside the San Diego region, many are a combination of business and pleasure trips.

Communications/Emergency Services/National Defense

The use and growth of general aviation airports in and around large metropolitan regions has created the opportunity for the provision of services not available through other transportation modes. They can provide rapid communication of material and personnel between governmental units in widely separated geographic areas and provide secure sites for communication centers. The use of airports can aid in inspection and supervision of large areas that are under control and management of local government.

The provision of emergency services is another activity that is a potential use of the airport. In the Southern California region with the potential dangers of large region-wide brush and forest fires, the airports offer landing facilities for airborne fire fighting equipment. It also offers facilities for the basing and support of personnel used for dealing with potential civil disturbances. The airport can serve as a base for the rapid evacuation of injured in the event of a disaster in the region.

The airport can serve as very good location for types of manufacturing that requires security. High value or security sensitive equipment of a civilian and military nature can be moved by air more simply and more rapidly than other transportation modes with a higher degree of security. The airports can provide emergency landing facilities for larger aircraft.

The existence of general aviation airports also has a national defense function. The training of pilots is a definite national strength that has many military implications. An example of this is that today many of the ROTC programs have pilot training programs involving the local airports of the County.

Numerical Estimates of Semi-Quantifiable Data on Airport Impacts[38]

Regional Activities	1973-74	1974-75	1975-76
Airport Payrolls	$ 7,178,400	$ 7,896,240	$ 8,685,684
Indirect Impact of Employment	10,767,600	11,844,360	13,028,526
Estimate Public and Private Construction	4,000,000	4,200,000	4,400,000
Indirect Impacts of Construction	6,000,000	6,300,000	6,600,000
Total Semi-Quantifiable Regional Benefits	$27,946,000	$30,240,600	$32,714,215

Conclusion

The impacts on the San Diego Region from the San Diego County airport system are indeed significant. "A recent study by the Economic Development Administration on the economic growth of 34 pairs of cities shows that airports can significantly benefit the economy of medium-sized cities. The study concludes that civil aviation can have a positive impact on the manufacturing growth of a city,

and that the extent to which a city can realize the full benefits of air service depends upon the city's population size, its proximity to other transportation systems, its regional location, the growth of established industry in the region, and the mileage from the center city to the airport."[39] An airport does not guarantee local prosperity nor that when it is first constructed it will be self-sustaining. After sometime, however, it may become an economic asset if its development is part of a multi-dimensional civic improvement program.[40] In Nicholsen and Wiley's text, Air Transportation Management, Its Practices and Policies, they state that "there is a fundamental relationship between air transportation and the public welfare."[41] This can be seen in the fact that "in a large number of cases airports serve to accelerate the growth rate of development above that which would occur under normal circumstances."[42]

FOOTNOTES

[1]Jeremy J. Warford, Public Policy Toward General Aviation--Studies In the Regulation of Economic Activities, The Brooklyn Institute, Washington, D. C., 1971, page 1.

[2]Ibid., page 2.

[3]Southern California Laboratories of Stanford Research Institute, Economic Principles for Pricing Airport Services, South Pasadena, California, November, 1961, page 19.

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[7]Robert J. Bresnahan, Director of Aviation for Orange County, California, "Airport Economic Impact on the Community," unpublished.

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[14]Federal Aviation Administration, System Planning Division, The Airport--Its Influence on the Community Economy, Washington, D. C., page VII.

[15]Ibid., page VI.

[16]Ibid., page VIII.

[17]Ibid., page VI.

[18]Ibid., page V.

[19]Kenneth G. Clare, Southern California Regional Airport Study, Southern California Laboratories of Stanford Research Institute, March, 1964, page 45.

[20]E. R. Guecuda, "Small Airports," Federal Aviation Administration, January, 1959, page 28.

[21]"Planning the Airport Environment, Report No. 231," American Society of Planning Officials, February, 1968.

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[23]Daniel, Mann, Johnson, and Mendenhall, San Diego Plan for Air Transportation, Supplemental Report Number One, Comprehensive Planning Organization, May, 1974.

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[26]Stanford California Laboratories of Stanford Research Institute, Economic Principles for Pricing Airport Services, South Pasadena, California, November, 1961, page 20.

[27]Ibid.

[28]Federal Aviation Administration, Aviation Forecasts Fiscal Year 1975-1986, U. S. Department of Transportation, September, 1974.

[29]D. N. Lanier, Jr., and Lawrence C. Murdoch, Jr., Gateways to the World Water Ports and Airports of the Penjerdel Region, September, 1972, page 19-23.

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CORRECTION

To assure optimum legibility the preceding document and/or group of documents have been re-photographed and their images appear immediately hereafter.

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Department of General Services

Central Records Service

County Operations Center, 5555 Overland Avenue, San Diego, California 92123

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R J MASSMAN
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...s of
...ty Engineer & Road Commissioner
County Surveyor
County Airports

October 15, 1975

RECEIVED
OCT 16 1975
ENVIRONMENTAL ANALYSIS DIVISION

TO: Environmental Analysis Division

FROM: Airports Division

SUBJECT: Palomar Airport Environmental Impact Report

The review of the Palomar Airport Environmental Impact Report has raised three additional questions. The questions and the answers are:

1. What agricultural land will be removed if the project is constructed?

   None. The land to be used for the second runway is unsuitable for farming due to topography, clay pits and an illegal dump. Photographs of the area taken prior to building the present airport do not show any evidence of farming.

   It should also be noted that the land under consideration is not zoned for agriculture.

   Recently acquired airport clear zone land is being leased for the development of high yield wheat seeds. The airport is making a positive contribution to the environment and agriculture development.

2. What are the air traffic alternatives?

   None. The nearest airport that can provide the same level of service is Lindbergh Field. It is expected that Lindbergh Field will reach full capacity prior to Palomar Airport. In addition, there has been serious consideration to exclude general aviation traffic from Lindbergh Field.

3. What additional Community Noise Equivalent Level data is available?

   (a) "The Airport Noise Study for San Diego County" dated November, 1972, prepared by Daniel, Mann, Johnson, and Mendenhall. Excerpts attached.

(b) "Comprehensive Land Use Plan Palomar Airport" dated May, 1974, prepared by Wilsey and Ham. Copy attached.

If further information is desired, please contact Al Waldman, #565-5572.

A. C. WALDMAN, Director
Airports Division

ACW:sk

Enclosures

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15. Population Forecasts for San Diego County 1975-1990, May 18, 1970, San Diego County Planning Department

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37. AC150/5340-1D - Marking of Paved Areas on Airports, (1-19-73).

38. AC150/5340-4B - Installation Details for Runway Center Line and Touchdown Zone Lighting Systems, (5-6-69).

39. AC150/5340-5A - Segmented Circle Airport Marker System, (9-10-71).

40. AC150/5340-13B - High Intensity Runway Lighting System, (3-24-73).

41. AC150/5340-14B - Economy Approach Lighting Aids, (6-19-70).

42. AC150/5340-15B - Taxiway Edge Lighting System, (4-4-72).

43. AC150/5340-16B - Medium Intensity Runway Lighting System and Visual Approach Slope Indicators for Utility Airports, (10-26-70).

44. AC150/5360-1 - Airport Service Equipment Buildings, (4-6-64).

45. AC150/5360-2 - Airport Cargo Facilities, (4-6-64).

46. AC150/5360-3 - Federal Inspection Service Facilities at International Airports, (4-1-66).

47. AC150/5390-1A - Heliport Design Guide, (11-5-69).

48. Aviation Advisory Commission, Aviation in a Long-Range Public Planning Context, February 15, 1973.

49. The Long Range Needs of Aviation - Report of the Aviation Advisory Commission, January 1973.

50. Industrial Data, San Diego County, San Diego Chamber of Commerce, November 1971.

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City of Carlsbad

Environmental Impact Report for the Palomar Airport Annexation

EIR-387
Exhibit A
April 19, 1977

Palomar Airport Annexation
Final Environmental Impact Report

Prepared by:

CITY OF CARLSBAD PLANNING DEPARTMENT
1200 Elm Avenue
Carlsbad, California 92008

CONTENTS

City of Carlsbad
Planning Department
Staff Recommendation

Date: August 2, 1977

Subject: EIR-387, Palomar Airport Annexation

Applicant: City of Carlsbad

Findings:

1. The EIR meets all requirements of the California Environmental Quality Act and the Carlsbad Environmental Protection Ordinance of 1972.

2. The EIR has been properly noticed and reviewed.

3. No unavoidable adverse impacts will result from the project.

Recommendation:

It is recommended that Final EIR-387 as contained in this document be CERTIFIED based on the above findings. Any comments received as part of the public hearing shall be included in the Final EIR.

Discussion:

The annexation of Palomar Airport will result in no physical changes to the existing use. The primary effects of the annexation will be to increase Carlsbad's planning authority over the airport, formalize Carlsbad's provision of services to the airport, and redistribute the tax revenues generated by the airport.

DHW:ar

List of Reviewing Agencies

Local Agency Formation Commission
County of San Diego Environmental Analysis Division
Comprehensive Planning Organization
Airport Land Use Commission
Couty Department of Public Health
County Air Pollution Control District
San Diego Coast Regional Commission
Carlsbad Municipal Water District (CMWD)
Woodside/Kubota and Associates (Consulting Engineers for CMWD)
San Diego Gas and Electric
City Engineer
Fire Chief
Public Works Administrator
City Manager

COUNTY OF SAN DIEGO

Environmental Analysis Division

Community Services Agency

9150 Chesapeake Road (MS 0175), San Diego, California 92123 . . . Telephone 565-5757

June 28, 1977

Ms. Dana Hield Whitson
Assistant Planner
City of Carlsbad
1200 Elm Avenue
Carlsbad, California 92008

SUBJECT: Draft EIR, Palomar Airport Annexation; Log #77-7-26

Dear Ms. Whitson:

The Environmental Analysis Division staff has completed its review of the draft Environmental Impact Report for the proposed annexation of the Palomar Airport to the City of Carlsbad located within the County of San Diego.

We have no comments at this time.

Respectfully,

BRADFORD K. WILLIAMS
Environmental Impact Report Coordinator
Environmental Analysis Division

BKW:JBG:acn

WOODSIDE/KUBOTA & ASSOCIATES, INC.
CONSULTING ENGINEERS
2965 Roosevelt St. • P. O. Box 1095 • Carlsbad, California 92008 • (714) 729-1194

July 8, 1977

Mr. James Hagaman, Planning Director
City of Carlsbad
1200 Elm Avenue
Carlsbad, Ca. 92008

Subject: Palomar Airport Annexation EIR -
Carlsbad Municipal Water District

Dear Mr. Hagaman:

Thank you for the opportunity of the Water District to respond to the subject EIR prepared by your department. From the stand point of the public water service agency for the property under discussion and the fact that we are geographically neighbors of the Palomar Airport, we offer you the following comments:

1. One of the foremost considerations of the proposed annexation is to bring under the control of the City of Carlsbad the land use impact of this neighbor airport upon the entire community of Carlsbad and the surrounding area. To date under the control of the County Board of Supervisors, the airport has developed to the point where there are substantial problems of incompatibilities of land use between the airport properties and their neighbors. As a matter of fact there are lands such as our Water District already within the City of Carlsbad who are now at the mercy of gross noise pollution and we are severly handicapped in making our plight known.

   Accordingly, we feel very strongly that if the annexation is to proceed, there should be a complete understanding that the City of Carlsbad is in the absolute position to bring discipline and order in the entire neighborhood. Our concerns are further amplified by the fact that the County of San Diego is now processing a Conditional Use Permit for the airport itself. At the very least we find it highly unusual that after all of these years, the County would proceed in this direction just at the same time they are processing an annexation to the City.

2. With respect to public service, namely public water service, we

want to advise you that the County of San Diego has at no time ever properly addressed the issue of an adequate public water system to serve the airport properties as well as the proposed expansion. Our District has from time to time reminded the County of San Diego that this important step is absolutely essential in order that our water agency can provide adequate service. We also want to remind you that the airport property under the ownership of the County does not contribute one penny of tax dollars to help finance all of the public water service facilities that the airport property now enjoys. We are hopeful that some day the County of San Diego will recognize its financial obligations so that the rate payers and the tax payers of the entire District can be relieved of their financial burdens.

3. From our vantage point of a public water service agency, we question the validity of the information contained in the EIR relating to revenues that will accrue to the City of Carlsbad. We recognize there are several interpretations of this sphere of consideration; however, we are of the firm opinion that a tax exempt agency must pay some form of "in lieu taxes" in order to be responsive to their fair share of public services costs.

We welcome the opportunity to respond to any questions you may have regarding this submission and please advise when you will be conducting the public hearing portions of these proceedings.

Very truly yours,

Jack Y. Kubota, District Engineer
Carlsbad Municipal Water District

cc: Carlsbad Municipal Water District
Legal Counsel
Lovell Hulbert

JYK/wv
CMWD 7711

MEMORANDUM - July 13, 1977

TO: Dana Whitson, Planning

FROM: City Engineer

SUBJECT: Palomar Airport Annexation EIR

In reviewing the draft, I notice that revisions are needed to Page 14 - 3 Community Services, b. Sewer Service.

A review of the agreement indicates that there is no reference to 10,000 gallons per day as an upper limit of flow from the Airport. Also, the sewer moratorium does affect the Airport as there are no exemptions other than the Council would have to make a case-by-case review of ("other governmental agencies").

I have notified the County that sewer connection permits are not available.

Tim Flanagan
City Engineer

TCF:ms

c: PWA

Planning Director's Response to Comments on the Draft EIR

County of San Diego Environmental Analysis Division - No comment

Jack Kubota, Woodside /Kubota and Associates, Inc. -

Comment: If annexation is to proceed, there should be a complete understanding that the City of Carlsbad is in an absolute position to bring order in the entire neighborhood.

Response: The annexation of the airport will have no immediate effect on the compatibility of the airport with surrounding uses. The City does intend to process a Conditional Use Permit for the airport and maintain authority over future fixed base uses which might be requested.

According to the City Attorney, the City has no zoning or land use authority over the airport functions which are owned and operated by the County. The City has, in the past, received assurances from the County that all planning for future airport facilities would be mutually determined.

In addition, both the City and the Airport Land Use Commission must review future developments in the vicinity of the airport in order to assure that noise and safety hazards will be restricted to acceptable levels.

Comment: The County has not properly addressed the adequacy of the existing public water system which serves the airport. The airport has not contributed to the financing of public water service facilities.

Response: The annexation will not affect the water service requirements for the airport. CMWD will continue to provide water services. It is true that the County is not taxed, and therefore does not contribute toward the financing of public water service facilities. However, this applies to all governmental facilities. CMWD, for example, pays no taxes to offset police and fire services afforded by the City.

Comment: We question the validity of the information contained in the EIR relating to revenues that will accrue to the City of Carlsbad.

Response: The revenue figures are based on the actual revenues received by the County for FY 1975-76. The total annual revenue expected to accrue to the City is $49,450. Staff has not attempted to determine whether those revenues will equal the City's expenditure for services. However, in that the City presently receives no renumeration for

services already provided, the revenues accrued to the City as a result of annexation will at least help to offset service costs.

Comment: Tax exempt agencies should pay some form of "in-lieu taxes" in order to be responsive to their fair share of public service costs.

Response: This is a matter of State and Federal policy. The equity of taxation practices has been widely debated. In actuality, few developments pay taxes which are roughly equivalent with the services they receive. There is no local authority for charging "in-lieu taxes".

City Engineer:

Comment: Refer to Page 14-3 Community Services, b. Sewer Service.

A review of the sewer agreement between the City and the County of San Diego indicates that there is no 10,000 gallon per day upper limit of flow from the airport as mentioned in the draft EIR. The sewer moratorium does affect the airport and no new sewer connection permits will be issued unless exempted by the City.

Response: This revision is noted. As pointed out in the draft EIR, the problem with sewer service capability exists regardless of whether the airport is annexed.

DHW:ar

Mr. Butts in rebuttal said he agreed that the yard areas needed attention. He reported that as soon as the contractor has completed the conversion of his garage, he would bring the lawn up to neighborhood standards. He said this would take approximately 45 days. He said he had no objection to moving the metal storage shed in the frontyard to the backyard and would do it on August 11th. He said he would move the sideyard metal shed to the backyard if necessary.

The Commission indicated that Mr. Butts was operating a facility that was non-conforming to the area and should maintain standards compatible with the neighborhood. It was pointed out that Mr. Butts is in violation of the zoning code by having the metal shed located where it is in the front yard, by letting the weeds grow and trash collect in his yard and caring for six people before the conditional use permit had been approved.

Mr. Butts said the two people over and above the original four were temporary and would be leaving by the end of the week.

The Public Hearing was closed.

A motion was made to deny CUP-138 based on the findings that the use was not compatible with the neighborhood.

	LARSON	ROMBOTIS	WOODWARD	FIKES	JOSE	WATSON	L'HEUREUX
MOTION		X					
AYES		X		X	X		
NOES	X		X			X	X

The motion did not carry.

There was a discussion on whether the conditional use permit could be limited to a number of four and if the conditional use permit was approved and subsequently at a later date revoked, could Mr. Butts then operate the facility for four under the original non-conforming use.

A motion was made that CUP-138 be continued to October 12, 1977 for the purpose of allowing Mr. Butts to comply with his testimony to clean up the yard and bring it up to existing neighborhood standards.

	LARSON	ROMBOTIS	WOODWARD	FIKES	JOSE	WATSON	L'HEUREUX
MOTION						X	
AYES	X					X	
NOES		X	X	X	X		X

The motion did not carry.

A motion was made to continue CUP-138 to continue CUP-138 to August 24, 1977, to obtain legal advice from the City Attorney regarding: (1) Is it legal to limit the number of care patients to four on a conditional use permit, and (2) if the conditional use permit is reworded to limit the number to four and then is subsequently revoked, does the applicant have the right to continue using the facility as a non-conforming use.

	LARSON	ROMBOTIS	WOODWARD	FIKES	JOSE	WATSON	L'HEUREUX
MOTION		X					
AYES	X	X	X	X	X	X	X

(2) Case No. EIR-387, Palomar Airport Annexation - To consider certification of the Environmental Impact Report for the Palomar Airport Annexation.

Ms. Dana Whitson, Assistant Planner, gave the staff presentation. She explained that the EIR addresses itself only to the impact of the annexation of the airport.

The Commissioners discussed the economic impact that the annexation will have on Carlsbad in regard to services given in relation to revenues received. There was concern expressed for the legal responsibility of the airport if annexation occurs and discussion about the noise factors as they relate to the take-off and landing patterns of aircraft over the City of Carlsbad.

A motion was made to certify EIR-387 for the Palomar Airport Annexation with the inclusion of additional information showing the cost of services vs. the income generated by annexation for both the present time and projected figures.

	LARSON	ROMBOTIS	WOODWARD	FIKES	JOSE	WATSON	L'HEUREUX
MOTION							X
AYES	X	X	X			X	X
NOES				X			
ABSTAIN					X		

(3) Case No. GPA-49, County of San Diego - Approval of a General Plan Amendment to change the Land Use designation from OS (Open Space) to G (Governmental Facilities) to enable construction of a Solid Waste Shredder and Transfer Station.

Ms. Dona H. Whitson gave the staff presentation.

Clarence Kaufman, Sanitation and Flood Control, County of San Diego, said the area from Del Mar north would be served by this facility. The cities to the north near the Bonsall landfill would continue to deposit their trash there. The facility in Carlsbad would handle approximately 600 tons a day and serve about 170,000 population. Mr. Kaufman explained there were unusual circumstances in North County which limited the site availability for this project: (1) Either the areas were very close to developments, (2) The area would impact the airport (disposal sites cannot be located within 10,000 feet of airport runway under FAA regulations), or (3) There was too much rock in the more remote areas and not enough cover dirt or suitable geologic conditions for sanitary landfilling, and (4) it was necessary to have the site serve the population adequately. The site chosen does not have enough cover dirt for conventional landfill but can be utilized as a shredder wasteland fill because there is no requirement to cover daily. The EDA grant for 3½ million dollars for this project has certain time restraints which would not permit condemnation proceedings that would accompany the purchasing of new land. The site is County owned land.

Mr. Gary Wesch, County of San Diego, stated that the roads were City roads and the traffic would be the responsibility of the City. He realized there would be conditions placed on this.

Mr. Ross Spalding, 4123 F Street, Carlsbad, Manager of Japatul Corporation, who are the owners of the property adjacent to the west of the site, said he wished to go on record as not necessarily opposed to the project but concerned since they plan to build an industrial park and because of this they are concerned about the noise and aesthetics of the facility.

A motion was made to continue GPA-49 to August 24, 1977 in order to allow the Board of Supervisors time to certify the EIR on this project.

	LARSON	ROMBOTIS	WOODWARD	FIKES	JOSE	WATSON	L'HEUREUX
MOTION		X					
AYES	X	X	X	X	X	X	X

ADDENDUM TO EIR-387

Re: Supplemental Economic Information

Background

The Planning Commission requested that additional economic information on the cost of supplying services to the airport vs. the revenues received be added to the Palomar Airport annexation EIR.

The revenues to be generated can be fairly accurately predicted, based on revenue data for previous years. However, municipal service cost for police and fire protection and general government cannot be easily assigned to the airport. For example, the Police Chief has stated that the Airport annexation will not tax existing police services. However, when considered cumulatively with other new development, the annexation will contribute to a demand for increased police service.

In addition, there is no way of pro-rating the City's overall service costs as a means for accurately predicting the service costs for a single user. With these limitations in mind, Staff chose to discuss service costs in more general terms.

REVENUES[1]

Annexation of the airport would cause four significant sources of revenues to accrue to the City. The following estimate of revenues for the 1976-77 fiscal year is based on 1975-76 revenue figures.

Sales Tax — $13,050

Businesses are already paying this and revenue currently goes to County but would go to City when annexed.

Aircraft Personal Property Tax — $29,672

Aircraft at Palomar Airport are subject to this tax. At present, ½ of this tax goes to school districts and ½ to County. Upon annexation, distribution would be as follows: 1/3 County, 1/3 school districts, 1/3 City.

Possessory Interest Tax — $ 6,200

Possessory interest in land and improvements are subject to City property tax of $1.90. This tax is already levied by taxing jurisdictions which include the airport within their boundaries. Upon annexation, the City's tax levy would be added to the combined total.

Business License Tax — $528 plus

The revenue derived would depend upon the gross receipts of the businesses at the airport. A conservative estimate of $1,500,000 gross receipts was assumed for this estimate.

TOTAL: $49,450

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[1]This information is based on an October 20, 1976 memo from Frank Mannen, Administrative Assistant to the City Manager.

There do not appear to be any other significant revenue sources which would accrue to the City due to the annexation of the airport. Revenues are expected to increase commensurate with expanded usage of the airport.

SERVICES[2]

Sewer Service

The City of Carlsbad is presently providing sewer service to the airport. The City and County entered into an agreement regarding service in May, 1975. The County currently pays an annual sewer service charge as specified in the agreement. The agreement further provides that in the event the airport property is annexed to the City of Carlsbad, the agreement shall be deemed to be modified to provide for a rate (sewer service charge) established on the same basis as for other commercial and industrial users within the City limits.

Water Service

Water service to the airport is provided by Carlsbad Municipal Water District. Annexation should have no direct effect on the provision of water service to the Airport.

Trash Hauling

The same trash hauler operating in the City of Carlsbad is also providing service to the airport and this service would continue after annexation.

Leisure Service

The proposed annexation would have no significant impact on the demand for Park and Recreation and Library service.

Street Maintenance and Improvements

Since the airport property is in County ownership, the maintenance of streets and other public improvements within the airport would remain the responsibility of the County. The City of Carlsbad would become responsible for the maintenance of that portion of Palomar Airport Road which lies adjacent to Palomar Airport. The City Engineer indicates that it would be desirable for the County to bring this portion of Palomar Airport Road up to City maintenance standards prior to annexation.

To bring Palomar Airport Road to full standards as a prime arterial, the following improvements would need to be made to the 3400 feet upon which the airport fronts:

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[2] Ibid.

PALOMAR AIRPORT ROAD (106' Pavement/126'R.O.W.)

IMPROVEMENT (Between El Camino Real and Yarrow Road)		ESTIMATED COST
Curb, gutter and sidewalk ($20/L.F.)		$ 68,000
Street lights	34 @ $2000	68,000
Median construction	$10/L.F.	34,000
Landscaping		20,000
Paving and Base	50' additional width @ $1.00 S.F.	170,000
Grading and Excavation		50,000
Traffic signal @ P.A.R. & Yarrow		60,000
Traffic signal @ P.A.R. & El Camino Real		80,000
Relocate utilities		50,000
		$600,000
Engineering, inspection (15%)		$ 90,000
Contingencies (20%)		120,000
	TOTAL	$810,000

Business License Enforcement

Most businesses operating at Palomar Airport would be subject to the City Business License requirements. After an initial effort to insure that all businesses are licensed, there should be no significant enforcement problems at the airport. The Airport Manager has indicated that he will assist the City in any way possible to help insure that businesses are properly licensed.

According to the City Clerk the anticipated business license revenues ($528+) should more than cover administrative costs.

Police Services

The Police Department indicates that the proposed annexation will have a very slight effect on its patrol activities. Routine patrol service can easily be provided through the present beat organization. It is not anticipated that the airport will generate a significant demand for police service.

The Police Chief indicated that a very rough estimate of Police service costs for the airport would be $10,000 annually.

Fire Service

The fire service required at the airport will fall into three categories; inspection, structural fire protection and crash services.

The demand for fire services in the short term will not heavily impact the Fire Department. There will be an increase in fire inspection activities, but this increase can be integrated into the present work load of the Fire Inspection Division. The Fire Chief estimates that fire inspection of the airport will require approximately 15 man-hours annually.

Structural fire protection at the airport can be adequately provided from the La Costa Station for the short term. However, as the industrial property at the airport and in the adjacent industrial parks develops, an additional station will be required in the general vicinity of the airport. The cost of this station must be assigned to all future uses in the vicinity of the airport.

Crash services are currently provided by a light crash truck stationed at the airport and manned by County personnel. The truck is only manned on a part-time basis generally during daytime hours. If in the future improved crash service is required, this will need to be negotiated by the County. The Fire Marshall indicates that the water supply to the Airport should be upgraded. The water system should be looped and additional hydrants installed in order to provide adequate fire-flows to all structures at the airport. It is anticipated that this upgrading will occur as the airport develops.

Building Inspection

Annexation should not create a significant demand for service from the Building Department. The Building Department has indicated that building permit fees exceed the costs for plan check and inspection.

SUMMARY

The City already provides many municipal services on an informal (police and fire) or contractual (sewer) basis for the airport. We receive no tax revenues for those services at the present time.

We cannot predict the actual cost of providing City services to the airport. However, we do know that the increased service demands can be reasonably accommodated. The $50,000 annual revenues would appear to cover the increased service liability (beyond those services already provided.)

PALOMAR AIRPORT ANNEXATION

DRAFT

ENVIRONMENTAL IMPACT REPORT

Prepared by:

City of Carlsbad Planning Dept.
1200 Elm Avenue
Carlsbad, California 1977

April 18, 1977

TABLE OF CONTENTS

LIST OF TABLES

Section I. Introduction and Summary

A. Purpose

This Environmental Impact Report addresses the proposed annexation of the Palomar Airport property to the City of Carlsbad. Carlsbad is the lead agency for the annexation. The San Diego Local Agency Formation Commission and the County of San Diego (as the owner and operator of the airport) are responsible agencies, as defined in Section 15039 of the State EIR Guidelines as amended January 1, 1977.

The County Board of Supervisors certified an Environmental Impact Report for the Palomar Airport Master Plan (Log #75-7-13) in May of 1976. That EIR addressed the environmental setting of the airport and the surrounding area and the effects of the existing and anticipated future airport operations. As allowed in Section 15149 of the State EIR Guidelines, relevant portions of the Palomar Airport Master Plan EIR have been summarized and incorporated by reference in this EIR. Copies of the Palomar Airport Master Plan EIR are available for review at the following locations:

1. City of Carlsbad Planning Department
   1200 Elm Avenue

2. Carlsbad Public Library
   Government Document Section
   1250 Elm Avenue

3. County of San Diego
   Environmental Analysis Division
   9150 Chesapeake
   San Diego, Calif.

The purpose of this EIR is to examine both the localized and regional, short-term and long-term effects of the annexation of Palomar Airport. It is the City's policy to use an EIR as a planning tool for early identification of the environmental effects of an action. The City will mitigate any adverse environmental impacts, or approve lesser impacting alternatives unless it is socially or economically unfeasible to do so.

B. Summary

1. Project Description

The City of Carlsbad proposes to annex the 256 acre-Palomar Airport to the City of Carlsbad. The airport currently has one runway at a length of 4700 feet and a width of 150 feet. Approach lights, an instrument landing system, and a unicom radio are among the navigational aids existing on the site. The airport also sustains a number of airport-related fixed based operations and support facilities, including flight instruction and aircraft charter services, aircraft sales and rental, aircraft maintenance and repair services, storage, fuel services, and a restaurant. The airport houses management and federal aviation personnel onsite. The Hughes Tool Company assembly and test facility is also located on the site.

The annexation will affect the level of municipal services available to serve the airport. It will also change the distribution of sales tax, aircraft personal property tax, possessory interest tax and business license tax revenues. Since all of the territory proposed for annexation is owned by the County of San Diego, the City will not gain the same level of land use controls which would be applied to annexation of privately owned land. The County is required by the Public Utilities Code to submit plans to the City prior to the acquisition of land for the expansion or enlargement of the airport. However, the City has little legal authority for applying land use regulations or development standards to County owned property. The County as a courtesy, has encouraged the City's participation in long term planning for the airport, and it is anticipated that this informal cooperation will continue.

B. Significant Environmental Effects

The only adverse effect of the project will be a loss of sales tax and aircraft personal property tax revenues to the County at approximately $28,000 annually (using 1975-1976 revenue figures). As the airport expands its operations, this annual loss of revenue is also expected to increase. However, expansion of the airport operations is expected to increase user revenues, thus offsetting the County's operational costs. Staff believes that this adverse impact can be mitigated by improved services and lower fire insurance rates.

C. Beneficial Effects

The project will result in the following beneficial effects:

1) Police, fire and emergency medical services for the property will be greatly improved.

2) The annexation will reduce an existing county island, helping to correct a problem with illogical service and planning area boundaries.

3) The annexation will allow Carlsbad to collect revenues commensurate with services already being provided on an informal basis.

SUMMARY OF MITIGATION MEASURES

1. Although there is no legal basis for requiring it, the County should continue to enlist the City's participation in the planning and design of future airport facilities. This will assist in the compatible development of areas surrounding the airport.

2. The adverse economic impact to the County will be offset by:

   a. An improvement in the level of police, fire, and emergency medical services;

b. A decrease in insurance costs due to improved services (the fire rating for the airport will be significantly improved);

c. Increasing revenues from user fees.

II. PROJECT DESCRIPTION

The proposed project is the annexation of a 256 acre existing airport facility located at the northwest intersection of El Camino Real and Palomar Airport Road (see Figure 1 - Vicinity Map). The property is bounded by property within the City of Carlsbad on three sides.

The major effects of the annexation will be to:

1. Reduce an existing county island;

2. Formalize the requirements for Carlsbad to provide police and fire protection service for the airport; and,

3. Redistribute revenues generated by the airport.

The proposed annexation is to be considered by three agencies: The County of San Diego, the City of Carlsbad, and the San Diego Local Agency Formation Commission. The existing and planned airport facilities are described in detail in Sections 1.2 and 1.4 of the Environmental Impact Report for the Palomar Airport Master Plan (County of San Diego, Log No. 75-7-13). A layout of the airport facilities taken from that EIR is shown in Figure 2.

III. ENVIRONMENTAL SETTING

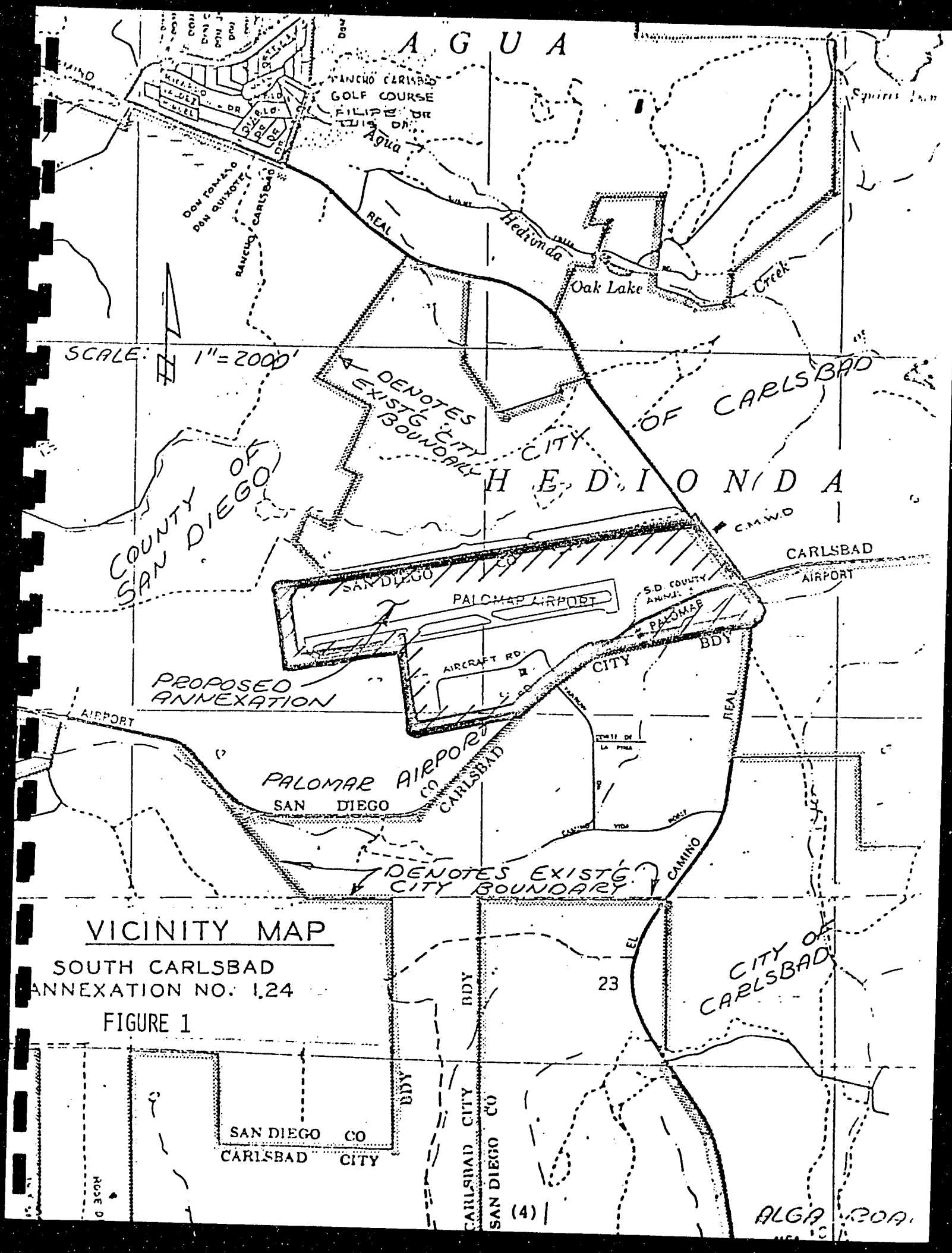
A. Physical Characteristics

1. Landforms- Palomar Airport is at an elevation of 328 feet above sea level, approximately five miles inland from the Pacific Ocean. It is situated on a narrow coastal plain less than a mile wide. The airport is located in an area characterized by a rolling terrain transversed by eroded canyons and water courses. The topography of the site is shown in Figure 3.

2. Geology and Soils - The geology and soils of the site are covered in detail in Section 2.5 of the EIR for Palomar Airport Master Plan. A map of geology of the airport site is contained in Figure 4.

   Briefly summarized, the Palomar Airport area is underlain by a Pleistocene age wave cut terrace which is cut by natural drainage courses. Much of the airport site has been extensively modified by grading and previous sanitary landfills.

3. Hydrology - At present, surface water exists on the project site only during and immediately following rainfall. The easterly portion of the property sheet flows toward Palomar Airport Road. The remainder of the drainage is directed to three southwesterly trending drainage courses originating at the westerly end of the property. A more detailed description of hydrology is con-



VICINITY MAP

SOUTH CARLSBAD
ANNEXATION NO. 1.24

FIGURE 1

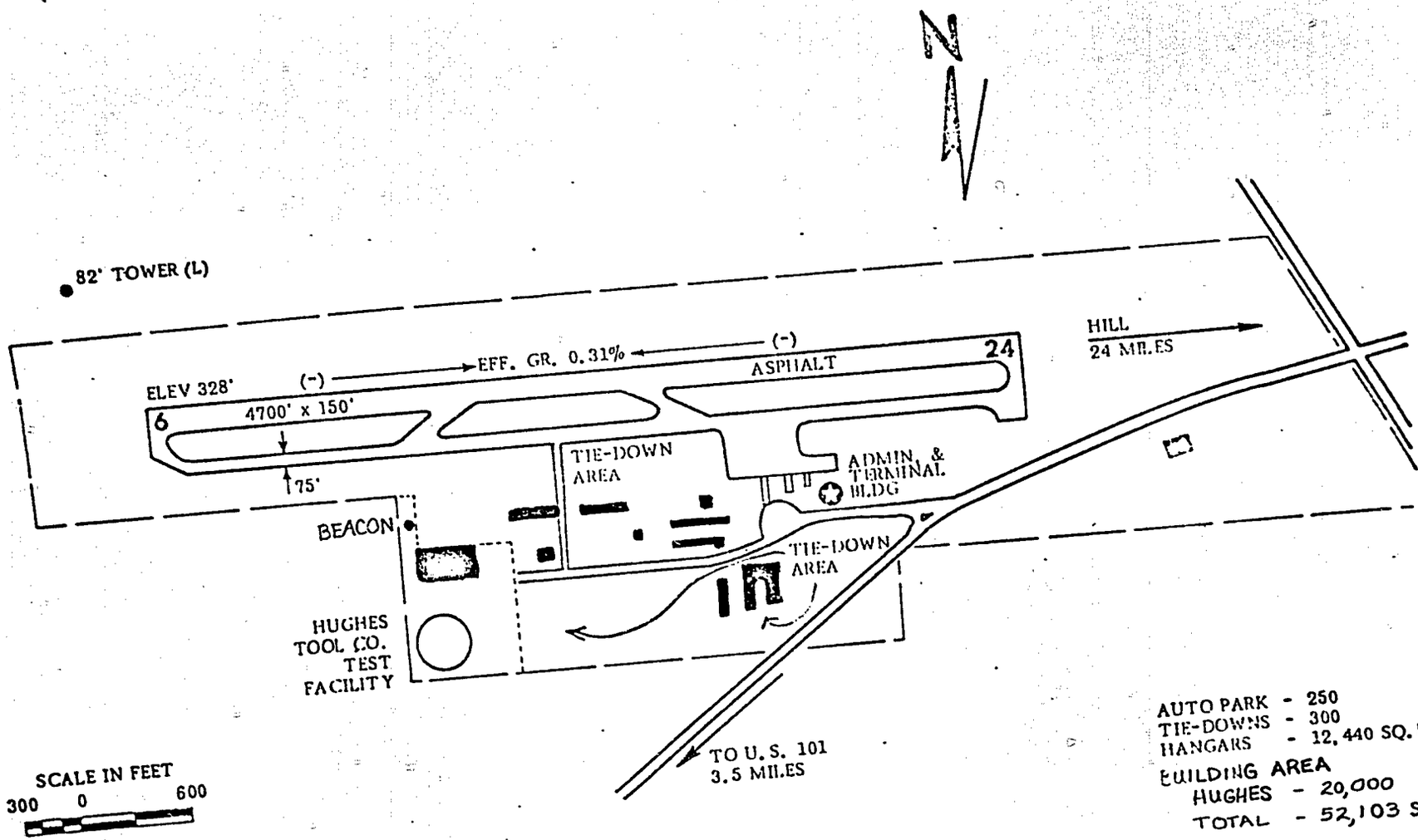
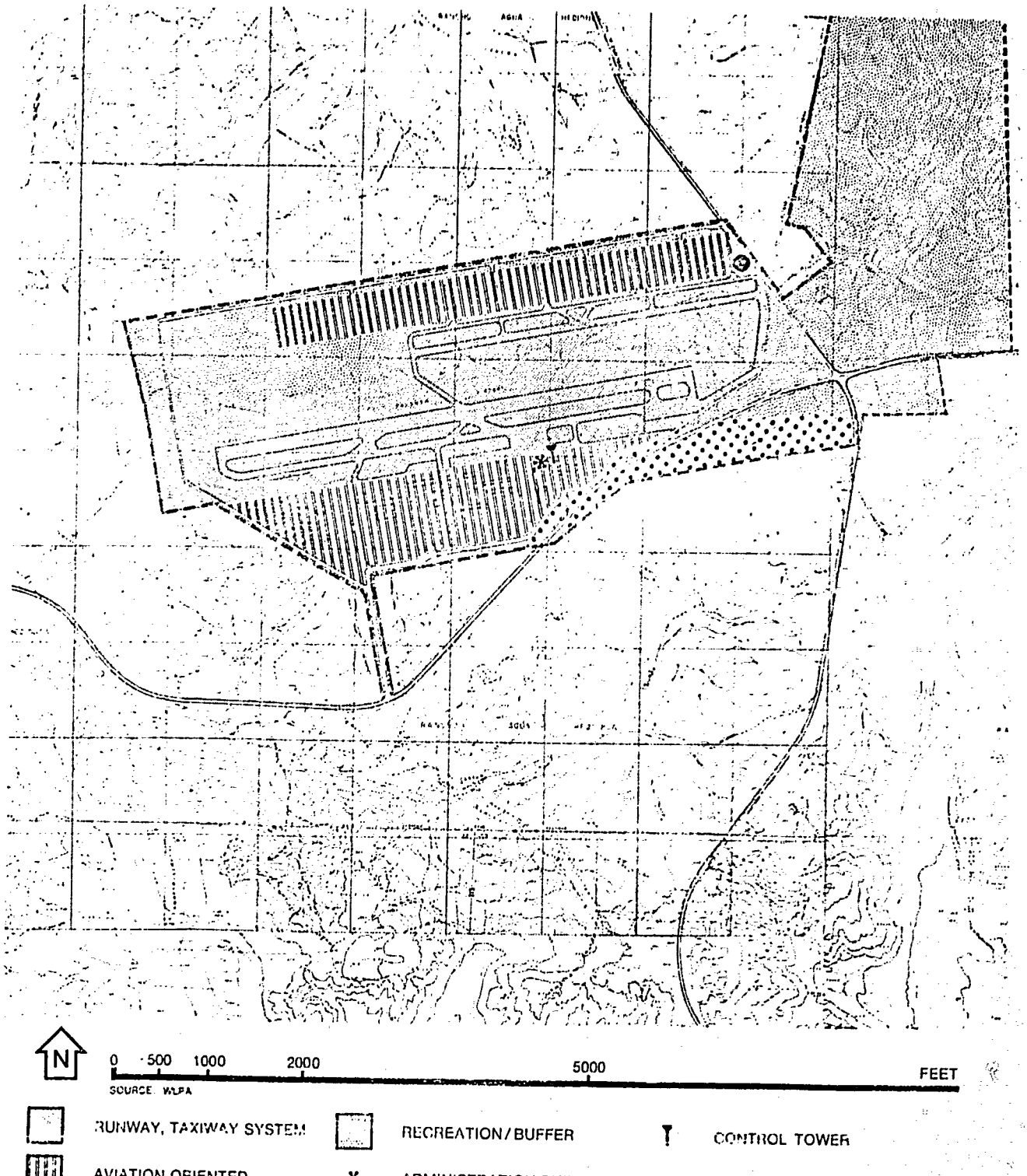


Figure 2 (a) Airport Layout – Palomar Airport, Carlsbad, California

Source: San Diego County, EIR for Palomar Airport Master Plan.



Ultimate Land Use Plan

Source: San Diego County, EIR for Palomar Airport Master Plan.

Figure 2(b)

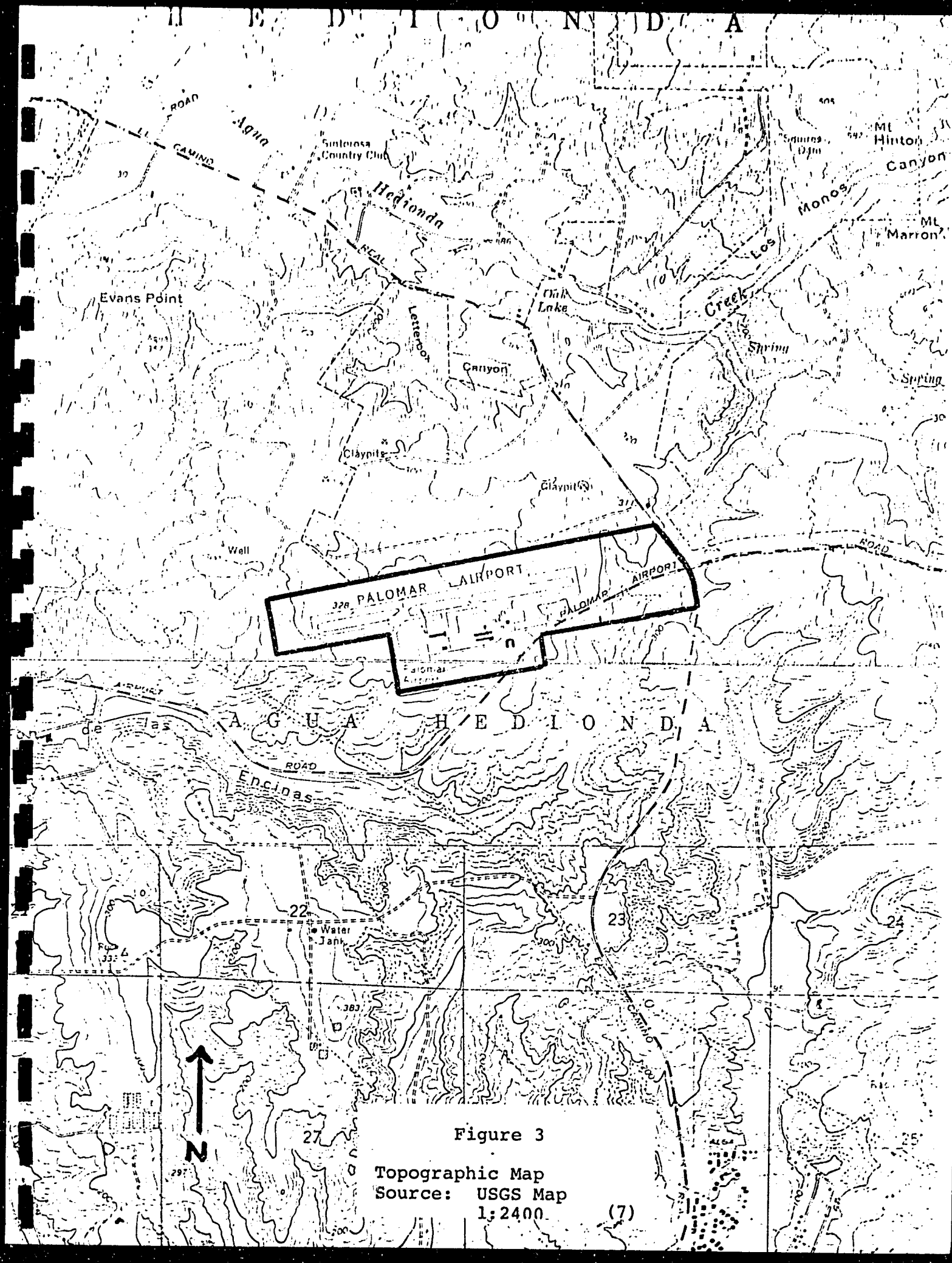
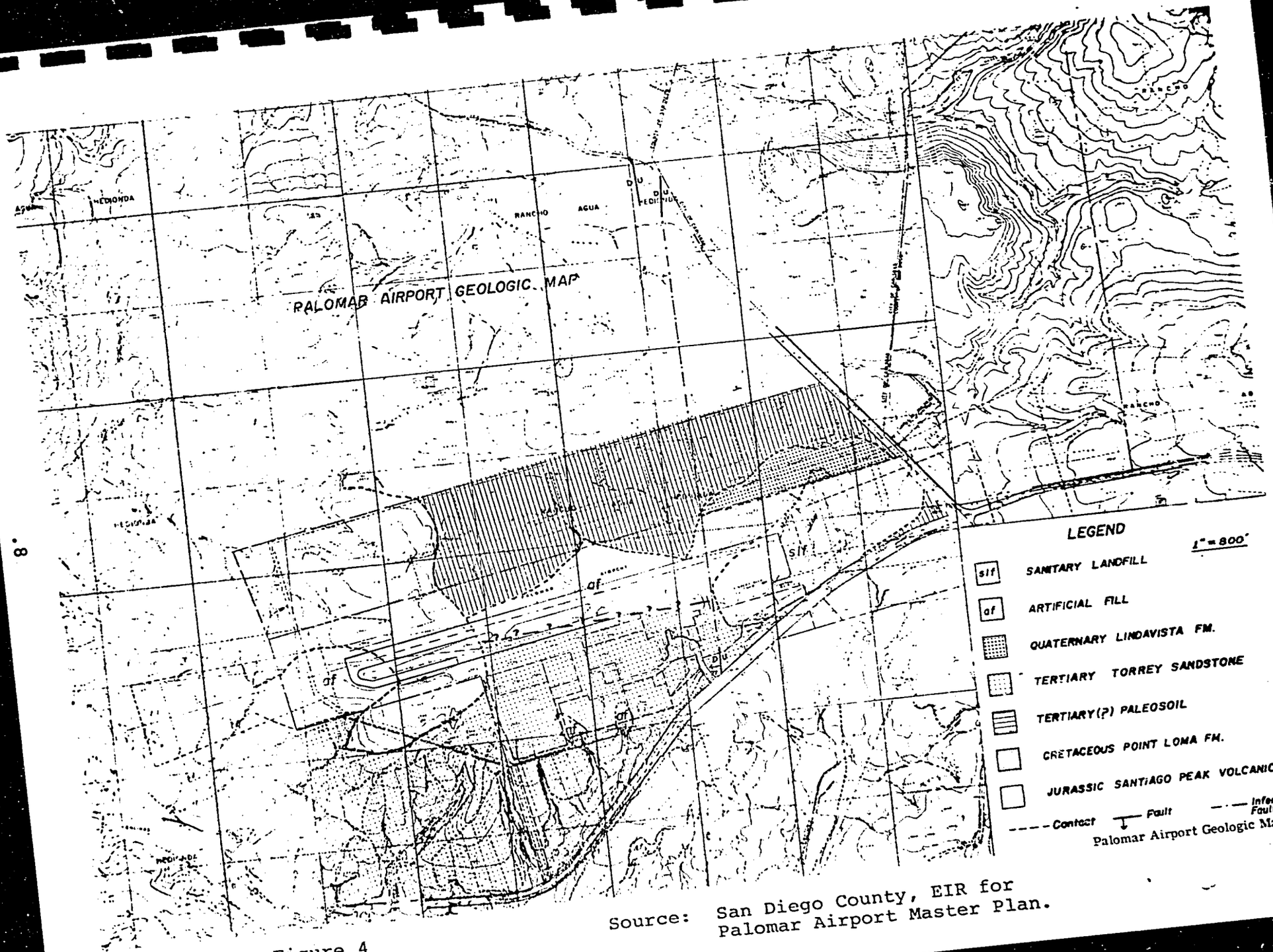


Figure 3

Topographic Map
Source: USGS Map
1:2400



Source: San Diego County, EIR for Palomar Airport Master Plan.

Figure 4

tained in Section 2.3 of the EIR for the Palomar Airport Master Plan.

4. Air Quality- The ambient air quality in the vicinity of Palomar Airport is described in Section 2.1 of the Palomar Airport Master Plan EIR. The emissions generated by the airport are as follows:

TABLE I PALOMAR AIRPORT 1973, EMISSIONS IN POUNDS/DAY

Sources	Hydro-Carbons	Particu-lates	NO_2	SO_2	CO
Motor Vehicles	499	22	430	14	3366
Industry	-------	-------	Negligible	---------	--------
Aircraft	174	111	111	12	5044
Evapora-tion (fuel)	142	-	-	-	-
TOTALS	815	133	541	16	8410

B. Biological Characteristics

The area surrounding Palomar Airport consists of three major vegetative communities: coastal sage scrub, chaparral and cultivated areas (truck crops -- primarily tomatoes). Figures 5 and 6 denote plant and animal species occurring or expected to occur on the site. No rare or endangered species were encountered during field surveys, or are expected to inhabit the site. A detailed description of the biological characteristics of the site is contained in Section 2.4 and Appendix II of the EIR for Palomar Airport Master Plan.

C. Human Characteristics

1. Land Use

The airport is close to the center of the Carlsbad planning area. To the south of the airport is the County Animal Shelter, the Hughes Aircraft Company Industrial Products Division, and the partially developed Palomar Airport Industrial Park. East of the airport is the Carlsbad Municipal Water District Office, and the clear/zone with runaway approach aids. North of the airport is a vacant parcel owned by Japatul Corp. (a wholly owned subsidiary of San Diego Gas and Electric Company.) Japatul has announced plans to apply for approval of a specific plan for an industrial park on their property. Those plans anticipate negotiations with the County for future airport expansion. Land to the west of the airport is vacant, with a portion being farmed with truck crops. Existing zoning and land uses from the Carlsbad Land Use Element of the General Plan for surrounding properties are shown on Figures 7 and 8.

Figure 5 Wildlife Checklist

Animal Species	Probable	Spotted
MAMMALS		
California Ground Squirrel (Citellus beecheyi)		X
Nimble Kangaroo Rat (Dipodomys agilis)	X	
Desert Wood Rat (Neotoma lepida)	X	
California Mouse (Peromyscus californicus)	X	
Short-eared Pocket Mouse (Perognathus fallax)		X
Mule Deer (Odocoileus hemionus)	X	
Coyote (Canis latrans)	X	
Gray Fox (Urocyon cinereoargenteus)	X	
Bobcat (Lynx rufus)	X	
Brush Rabbit (Sylvilagus bachmanni)		X
Dusky-footed Woodrat (Neotoma fuscipes)	X	
California Pocket Mouse (Perognathus californicus)	X	
BIRDS		
Costa's Hummingbird (Calypte costae)	X	
Cactus Wren (Campylorhynchus brunneicapillum)	X	
Lazuli Bunting (Passerina amoena)	X	
Wrentit (Chamaea fasciata)	X	
Brown Towhee (Pipilo fuscus)	X	
Sage Sparrow (Amphispiza belli)		X
Rufous-crowned Sparrow (Aimophila ruficeps)	X	
Mountain Quail (Oreortyx pictus)	X	
Scrub Jay (Aphelocoma coerulescens)		X
Poor-will (Phalaenoptilus nuttallii)	X	
Bewick's Wren (Thryomanes bewickii)	X	
California Thrasher (Toxostoma redivivum)	X	
Rufous-sided Towhee (Pipilo erythrophthalmus)	X	
Orange-crowned Warbler (Vermivora celata)	X	
REPTILES		
Western Fence Lizard (Sceloporus occidentalis)	X	
Striped Racer (Masticophis lateralis)	X	
Western Rattlesnake (Crotalus viridis)	X	
Southern Alligator Lizard (Gerrhonotus multicarinatus)	X	
Coast Horned Lizard (Phrynosoma coronatuna)	X	
INVERTEBRATES		
Ringlet (Coenonympha tullia)	X	
Common Checkspot (Euphydryas chalcedona)	X	
Leanira Checkerspot (Melitaea leanira)	X	
Bramble Hairstreak (Calophrys dumetorum)	X	
Mormon Metalmark (Apodemia mormo)	X	
Ceanothus Silk Moth (Platysamia euryalus)	X	
Another Silk Moth (Saturnia walterorum)	X	
Gray Hairstreak (Strymon adenostomatis)	X	
Hedgerow Hairstreak (Strymon saepium)	X	
Arota Copper (Lycaena arota)	X	
Callippe Fritillary (Speyeria callippe)	X	
Flat-headed Borer or Buprestid (Acmaeodera mariposa)	X	
California Timema (Timema californica)	X	
AMPHIBIANS		
Pacific Tree Frog (Hyla regilla)	X	
Introduced Bullfrog (Rana calesbiana)	X	

Source: San Diego County, EIR for Palomar Airport Master Plan.

Figure 6 Plant Life Checklist

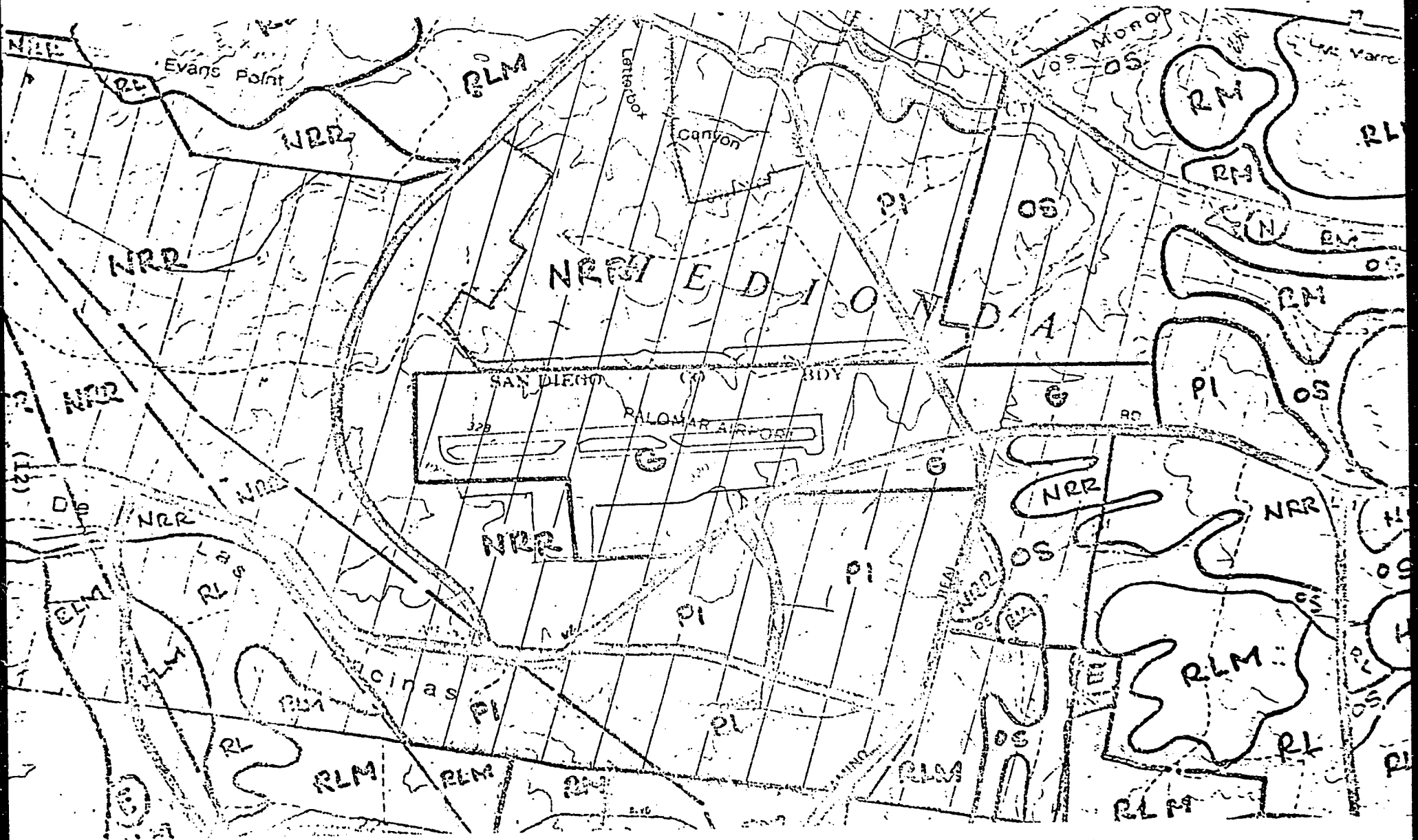
Plant Species	Location*	Abundance**
California Wormwood or Sagebrush (Artemisia californica)	UC	C
White Sage (Salvia apiana)	UC	C
Black Sage (Salvia mellifera)	UC	C
Encelia (Encelia farinosa)	UC	C
Yerba Santa (Eriodictyon californica)	UC	C
Eriophyllum (Eriophyllum confertiflorum)	UC	C
California Buckwheat (Eriogonum fasciculatum)	UC	I
Lemonade-berry (Rhus integrifolia)	UC	C
Prickly pears (Opuntia spp.)	UC	I
Our Lord's Candle (Yucca whipplei)	UC	I
Chamise (Adenostoma fasciculatum)	UC	C
Scrub Oak (Quercus durnosa)	UC	I
Foothill Ash (Fraximus dipetala)	UC	C
Hard Tack (Cercocarpus betuloides)	UC	C
Wild Lilacs (Ceanothus cordulatus, C. greggii, C. leucodermis, C. megacarpus, C. crassifolius, etc)	UC	I
Holly-leaf Cherry (Prunus ilicifolia)	UC	I
Bear Bush (Garrya fremontii)	UC	I
Quinine Bush (Garrya flavescens)	UC	I
Manzanitas (Arctostaphylos pungens, A. pringlei, A. glauca, A. glandulosa, etc)	UC	I
Toyon (Heteromeles arbutifolia)	SD	I
Sugarbush (Rhus ovata)	SD	C
Willows (Satix spp.)	SD	C
Common Tule (Scirpus acutus)	SD	I
California Bulrush (Scirpus californicus)		

* UC - UNCONSOLIDATED AND DISTURBED
SD - STREAMSIDE AND DISTURBED

** A - ABUNDANT
C - COMMON
I - INFREQUENT

Source: San Diego County, EIR for Palomar Airport Master Plan.

Figure 7 Proposed Land Use (Carlsbad General Plan)



RL: Residential Low Density
RLM: Residential Low Medium Density
RM: Residential Medium Density
N : Neighborhood Commercial
PI: Planned Industrial

E: Elementary School
OS: Open Space
NRR: Non-Residential Reserve
G: Governmental Facilities
▨: Special Treatment Area

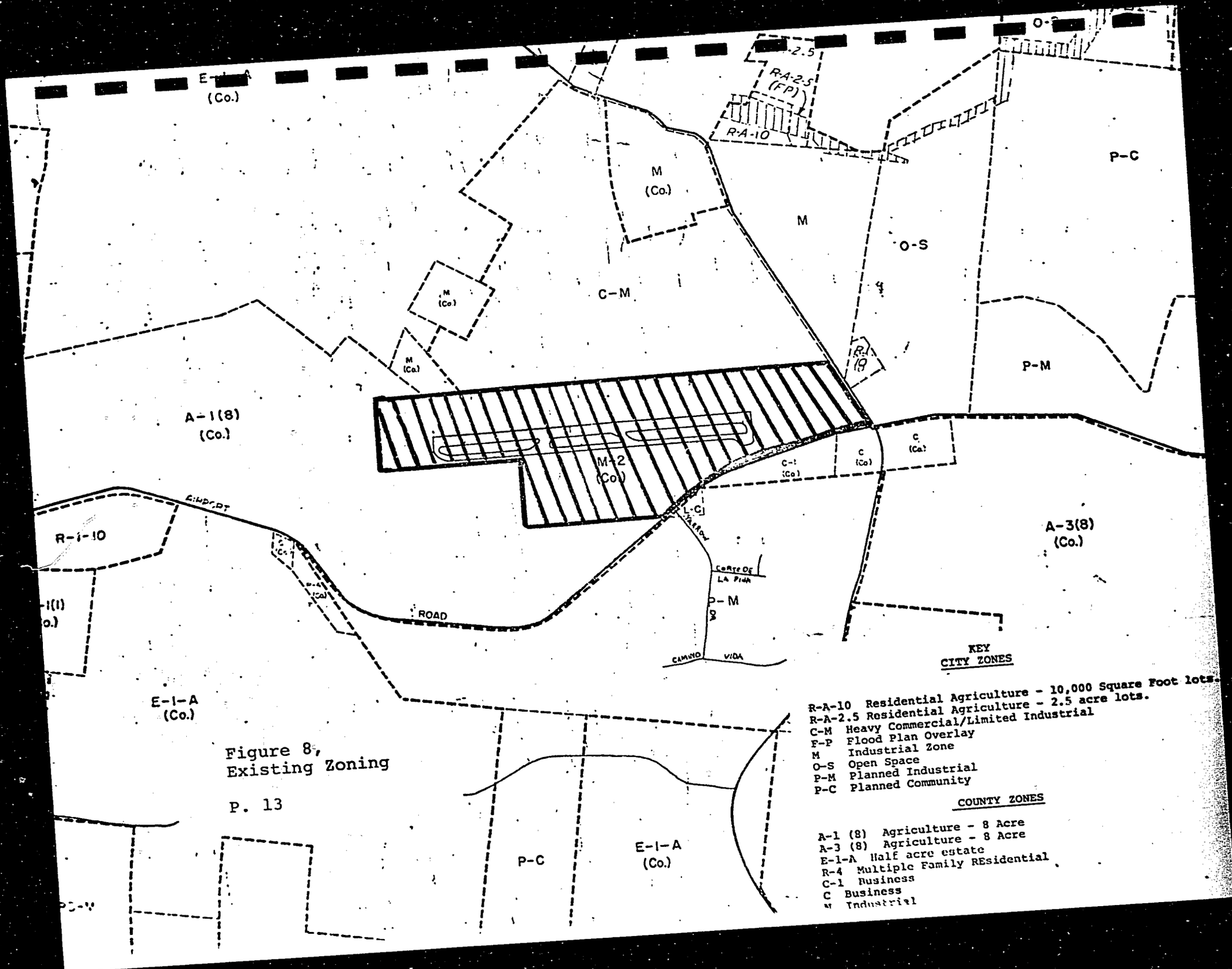


Figure 8,
Existing Zoning

P. 13

2. Socio - Economic Characteristics

The Palomar Airport Master Plan contains a separate socio-economic analysis (dated 9-19-75) on the existing and planned future operations at the airport. That analysis concluded that the enlarged airport would have an overall benefit of increasing safety, increasing the local tax base, and decreasing fuel use and travel costs.

The socio-economic effects of the airport's operation primarily benefit the region served by the airport: Carlsbad, San Marcos, Vista, San Dieguito, Fallbrook and Oceanside.

3. Community Services

a. Water Service - The airport is within the Carlsbad Municipal Water District Service boundary. The Palomar Airport Master Plan EIR contains a description of water service availability in Section 2.3. That report concludes that the existing water facilities are adequate for present requirements, and planned expansions will meet future needs.

b. Sewer Service - The present sewage flow for Palomar Airport is 5,000 gallons per day. Effluent is discharged through an 8" main to the Buena trunkline, which runs parallel to Palomar Airport Road to the Encina Treatment Plan. There is adequate line (transmission) capacity to handle existing and anticipated sewage flow from the airport.

Sewer service is provided on the basis of a contract between the County of San Diego and the City of Carlsbad. The contract allows Palomar Airport to discharge up to 10,000 gallons per day into the Buena trunk line. This right to discharge is for an indefinite period of time, but may be terminated after 90 day's notice at the discretion of either party.

The City of Carlsbad has recently enacted a six month moratorium on building permits involving sewer connections and discretionary permits (including annexations) because the City is expected to soon fill its legal capacity at the Encina Treatment Plant. The City specifically exempted the annexation of Palomar Airport from this moratorium. It is uncertain at this time whether the City will be able in the future to provide sewage transmission and treatment services in excess of existing flow. However, in that the City is already providing sewer service to Palomar Airport, this uncertainty would exist regardless of annexation.

c. Schools - The airport is within the Carlsbad Unified School District boundaries. Present enrollment is 4,358 students for grades K-12. No school sites are planned for locations near the airport and the flight path because of potential noise and safety hazards.

d. Police Protection - The property presently is provided police protection service by the County Sheriff's Department. The nearest Sherrif's Office is at a site near Encinitas Blvd. and El Camino Real, which is approximately 8½ miles from the airport. At the present time, the Carlsbad Police Department responds to emergency calls from the airport control tower (i.e, in case of crash or disabled aircraft). Assistance from the Carlsbad Police Department is performed on a courtesy basis approximately 6-10 times annually.

e. Fire Protection - The County has no fire protection service available to serve the airport except for one crash rescue truck kept on site. The City supplements the onsite equipment with fire fighting personnel and equipment from both La Costa and Station #3. Response time from both of these stations is approximately 3 minutes. Since Carlsbad provides this service simply as a courtesy to the County, there is no provision for back-up assistance. For instance, if fires occurred simultaneously at a location within the City service area and at the airport, the City would be obligated to provide priority service to the property which it is legally required to serve. Since the airport is not within the legal service area boundaries of the City, the City could not request assistance from another jurisdiction under the City's existing mutual aid agreement. The City Fire Department responds to approximately five calls to the airport annually. The existing water mains onsite are not adequate for fire protection purposes. These mains are proposed to be upgraded as part of planned expansions to the airport.

f. Health Care and Emergency Medical Services - Ambulance service is provided by the City of Carlsbad to the airport on the same informal basis as police and fire service. An ambulance can be dispatched from Stations #2 (La Costa) or #3 (Chestnut and El Camino Real) to the site within approximately 3 minutes. Accident victims are transported to Tri-City Hospital, located 8 miles from the airport.

g. Solid Waste Disposal - Solid waste disposal service is currently provided by McDougal Sanitation Company, which also provides the service to properties within the City limits. The McDougal Company deposits the refuse in the Gopher Canyon landill in Bonsall. The County proposes to open the new San Marcos landfill in April 1978. The proposed land fill is approximately 7 miles from the airport.

h. Public Utilities/Energy

Palomar Airport is served by 12Kv distribution facilities flowing from the Batiquitos substation, roughly two miles south of the airport. Gas service is provided from a two inch gas main adjacent to Palomar Airport Road and a four inch gas main running within El Camino Real. Palomar Airport does not consume a significant amount of natural gas and electricity relative to neighboring uses. The existing facilities are adequate for present airport use and should be adequate to serve the planned expansion of the airport.

4. Visual Quality/Aesthetics - The site possesses no special visual or aesthetic qualities. Surrounding chaparral and oak woodland areas may be preceived by people as aesthetically pleasing. The rolling topography surrounding the airport is also generally regarded as attractive.

5. Archaeology - The airport and surrounding areas were surveyed in August and September 1974 by an archaeologist with the San Diego County Engineering Department. Two archaeological sites were discovered in the clear zone area east of El Camino Real. The details of this survey are contained in pages 33-37 of the Palomar Airport Master Plan EIR. A map of archaeological sites on and around the airport property is contained in Figure 9.

6. Circulation/Ground Access - Palomar Airport is served by two arterial roadways and a limited number of collector streets. The entrance to the airport (Aircraft Road) was widened in 1974 and an access road through Palomar Airport Business Park (Yarrow Drive) was extended shortly thereafter. A detailed access study for the existing airport and planned expansions is contained in Appendix A of the Palomar Airport Master Plan (William L. Pereira Associates, 1975).

7. Noise - The existing noise attributable to the airport results from aircraft operations and related automobile traffic. The existing and projected noise levels of the airport's operations (100 CNR Contour) are shown in Figure 10. Tables II and III depict Expected Response to Composite Noise Rating Levels and Land Use Compatibility for Aircraft Noise. Pages 19-24 of the Palomar Airport Master Plan EIR discuss acoustic conditions in the vicinity of the airport.

Section IV. Significant Environmental Effects

Effects

The only significant adverse effect expected to occur as a result of annexation will be an annual loss of revenues to the County, estimated as follows:*

Sales Tax	$ 13,050
Aircraft Personal Property Tax (County's share of this tax would decrease by 33%).	14,836
TOTAL	$ 27,886

Inasmuch as the airport's operations will not change as a result of the annexation no impacts on the physical environment will result. Conceivably, if the airport did not annex and the City discontinued its assistance with police, fire and emergency medical services, the airport's protective/emergency services would be severly hampered.

* Based on 1975-1976 Fiscal Year Revenues.

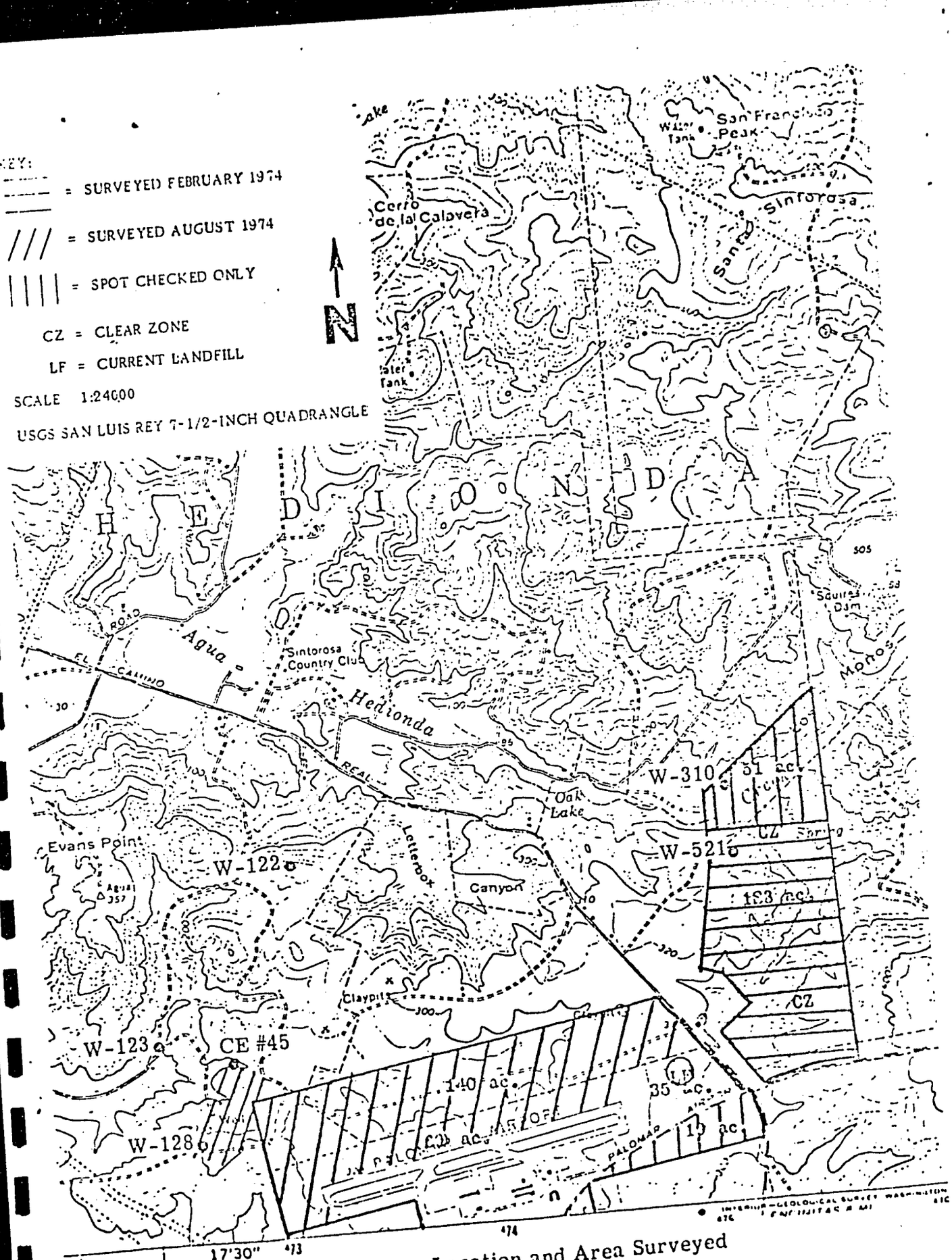


Figure 9 Location and Area Surveyed

Archaeological Sites

Source: San Diego County-
Palomar Airport Master Plan EIR.

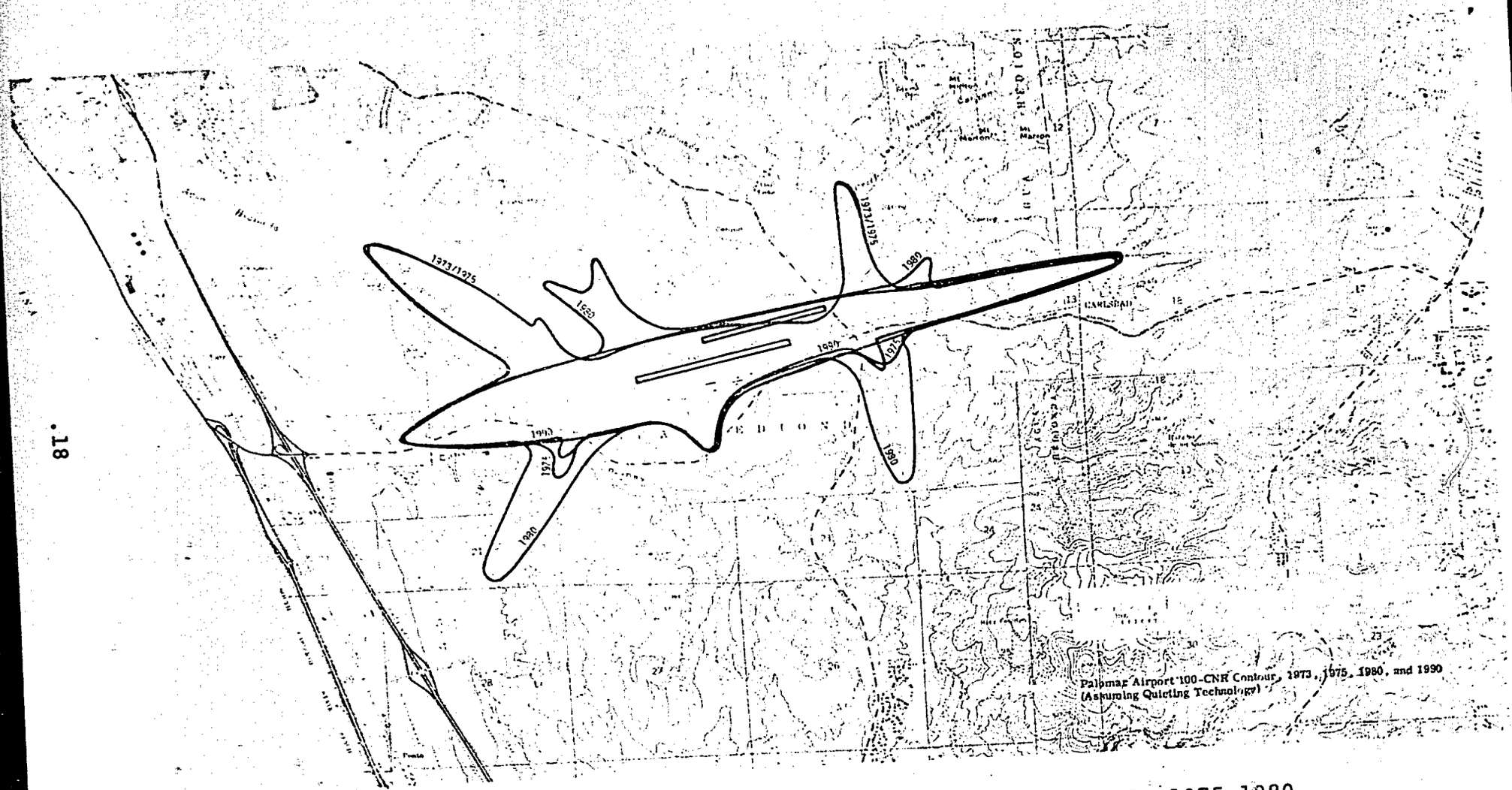


FIGURE 10: Palomar Airport 100-CNR Contour, 1973,1975,1980 (Assuming Quieting Technology).

Table II Chart for Estimating Response of Residential Communities from Composite Noise Rating

Composite Noise Rating		CNR Zone	Description of Expected Response
Takeoffs and Landings	Runups		
Less than 100	Less than 80	1	Essentially no complaints would be expected. The noise may, however, interfere occasionally with certain activities of the residents.
100 to 115	80 to 95	2	Individuals may complain, perhaps vigorously. Concerted group action is possible.
Greater than 115	Greater than 95	3	Individual reactions would likely include repeated, vigorous complaints. Concerted group action might be expected.

Table III Land Use Compatibility Chart for Aircraft Noise

Composite Noise Rating			Land Use Compatibility								
Takeoffs and Landings	Runups	CNR Zone	Residential	Commercial	Hotel, Motel	Offices, Public Buildings	Schools, Hospitals, Churches	Theatres, Auditoriums	Outdoor Amphitheatres, Theatres	Outdoor Recreational (Nonspectator)	Industrial
Less than 100	Less than 80	1	Satis	Satis	Satis	Satis	Note (C)	Notes (A, C)	Note (A)	Satis	Satis
100 to 115	80 to 95	2	Note (B)	Satis	Note (C)	Note (C)	Note (C)	Notes (A, C)	Note (A)	Satis	Satis
Greater than 115	Greater than 95	3	Unsat	Note (C)	Note (C)	Unsat	Unsat	Unsat	Unsat	Satis	Note (C)

Notes: (A) - A detailed noise analysis should be undertaken by qualified personnel for all indoor or outdoor music auditoriums and all outdoor theatres.
(B) - Case history experience indicates that individuals in private residences may complain, perhaps vigorously. Concerted group action is possible.
(C) - An analysis of building noise reduction requirements should be made and needed noise control features should be included in the building design.

Table IV Palomar Airport Annual Aircraft Operations

Year	Total	Single Engine	Twin Engine	Jet
1973	201,000	160,800	38,190	2,010
1975	232,000	185,600	44,080	2,320
1980	259,000	204,611	49,209	5,180
1990	402,000	301,500	88,440	12,060

Table V Peak Vehicular Traffic

Year	Peak Hourly Vehicular Traffic
1973	102
1975	124
1980	174
1990	368

In this instance, the County could provide police, fire, and emergency medical services by other methods, but this couldn't be accomplished as efficiently or economically as use of existing City services.

Section V. Measures to Mitigate Significant Effects

1. The adverse economic impact to the County will be offset by:

   a. An improvement in the level of police, fire and emergency medical services;

   b. A decrease in insurance costs due to improved services and a lower fire rating.

   c. Increasing revenues from user fees.

2. Because the airport is operated by a governmental agency, the City will gain no authority as a result of annexation over the land uses which occur on the property. The need to coordinate planning for the airport with surrounding properties has been recognized, and the County has encouraged the City's review of plans for the airport. Efforts to make the airport compatible with the surrounding area can be enhanced by:

   a. Upgrading of the landscaping on the bare slopes adjacent to Palomar Airport Road to mitigate the aesthetic impacts on surrounding properties. Native or drought-resistant plants should be used to mitigate water consumption.

   b. The County continuing to enlist the City's active participation in the planning and design of future airport facilities.

Section VI Environmental Effects Which Cannot Be Avoided

There are no significant adverse impacts associated with the annexation of the airport which are unavoidable.

Section VII Effects Found Not To Be Significant

A. Physical Environment

The annexation will have no effect on the physical environment. All physical impacts of the airport's existing and planned operations have been covered in the Palomar Airport Master Plan EIR.

B. Biological Environment

The annexation will not impact the biological environment. Biological impacts of the airport's existing operation and planned expansion are discussed in the Palomar Airport Master Plan EIR.

C. Human Environment

The annexation will have no effect on airport noise, energy consumption

land use, archaeology, visual quality, archaeology traffic circulation, water service or sewer service.

Section VIII. Alternatives

Since the airport is an existing use which will not be significantly altered as a result of annexation, the possible alternatives are limited to the following:

A. No Annexation (Services Provided on Present Basis)

This alternative would:

- Prevent the loss of revenues to the County;
- Keep police, fire and emergency medical protection services at the present minimum level;
- Cause the City to expend money for services for which no revenues are received;
- Allow continued existence of a County island.

B. No Annexation (City to Discontinue Police, Fire and Emergency Medical Service)

This alternative would:

- Preclude City expenditures for services;
- Decrease the level of protective services available;
- Increase the County's costs for extending police, fire and ambulance services;
- Increase the insurance costs for the Airport;
- Allow continued existence of a County island.

C. No Annexation (City to provide police, fire and emergency medical services on a contract basis)

This alternative would:

- Increase administrative costs for executing and periodically updating a contract;
- Possibly change the distribution of costs and revenues for provision of services;
- Improve the level of services available to the Airport;
- Allow the continued existence of a County island.

D. Increase Area to be Annexed

This alternative would:

- Be in violation of the City's sewer moratorium ordinance;
- Allow the annexation of properties for which the City has inadequate sewer service capabilities;
- Reduce the existing County island;
- Increase property taxes on undeveloped and agricultural lands which have no immediate development potential under the City's General Plan.

Section IX Relationship Between Short-term Use and Long-term Productivity

In the short-term, the airport has been able to function adequately with the protective services presently available on an informal basis. However, with the growth of the airport, these services are becoming less and less satisfactory. Annexation appears to be the most feasible method for improving existing services in the short-term, and planning for expansion of those services in the long-term concurrent with growth of the airport.

Section X. Irreversible Environmental Changes

There will be no irreversible environmental changes as a result of the annexation of the airport.

Section XI Growth Inducing Impacts

The annexation of the airport will have a minimal growth inducing effect. In that all adjacent properties except a 156 acre parcel west of the airport are already contiguous to City boundaries, the annexation could enable only one annexation. That adjacent property is shown on the City's General Plan as "Non Residential Reserve", meaning that it is not appropriate for residential use and that--- based on need, availability of services and relationship to surrounding areas --- the property is not ready for non-residential development.

Section XII Certification

To the best of my knowledge, this report represents an accurate analysis of the potential significant environmental effects of the proposed project.

Dana Hield Whitson
PROJECT PLANNER

James C. Hagaman
PLANNING DIRECTOR

Section XIII. Agencies and Persons Consulted

City of Carlsbad
Frank Mannen, Administrative Assistant
Capt. Wally Rossall, Police Department
Battalion Chief Alex Wolenchuck, Fire Department.

County of San Diego
Lovell C. Hurlbut, Airport Manager
Palomar Airport
Environmental Analysis Division

San Diego Gas & Electric - Mike Dudley

DHW:ar

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Deputy

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COUNTY OF SAN DIEGO

90-17

Department of General Services

Records Management

County Operations Center, 5555 Overland Avenue, San Diego, California 92123

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Deputy

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