THE PROPER ROLE FOR THE VENTURA COUNTY AIRPORT AT OXNARD

INFORMATION REPORT

72-2

Planning Department

City of Oxnard

INTRODUCTION

At its regular meeting of February 24, 1972, the Planning Commission requested the Planning Department to prepare a report concerning the type of airport and characteristics of operation for the Ventura County Airport at Oxnard which would be compatible with the Land Use Element of the Oxnard General Plan adopted in 1969.[1] The first section of the following report contains excerpts from the adopted General Plan concerning the Ventura County Airport at Oxnard and includes the adopted land use plan as Figure 1.

The next section of the report contains excerpts from the Master Plan of General Aviation for Ventura County.[2] This section contains projections of utilization of the Ventura County Airport at Oxnard based on the other major assumptions of that report.

The noise generation at the airport is the most limiting factor which would dictate land use abutting the airport. The third section of the report maps the noise contours prepared by the sound consultants, Wyle Laboratories, as the basis for the current airport agreement approved by the City Council.[3]

The fourth section contains selected sections of the Noise Standards of the Department of Aeronautics which are for noise control around an existing airport such as the Ventura County Airport at Oxnard.[4]

The final section indicates the desired noise contour, the number and type of aircraft, and the flight path limitations that would be necessary in order to insure complete compatibility with both the substance and the spirit of the Land Use Element of the Oxnard General Plan.

The limitations of a study of this type should be born in mind by the reader. Some of the studies quoted in this report are out of date and some were performed by clients other than the City with varying objectives and motives. This report does not touch on recent legislation concerning the regulation of land use around an airport nor does it attempt to explore recent court cases relative to the responsibility of cities in avoiding damage to abutting land use by an airport operation. These latter two subjects should be explored in a subsequent report.

RECOMMENDATIONS OF THE GENERAL PLAN

AIRPORTS [5]

The primary concept upon which is based the General Plan updating program for the City of Oxnard is that the City of Oxnard will be the dynamic urban center for Western Ventura County. Under this concept, it is mandatory that the City capture the opportunity for the development of the major commercial airport in the vicinity of Oxnard.

An entirely new system of communications and an entirely different time context relating to centers of urban activity have evolved during the past decade. This new level of communication has its focus upon the airport system. This is not to imply that air transportation was unimportant prior to the 1960's only that the important factors of scale and frequency were missing prior to the introduction of the jet airliner.

During the 1960's, a fairly elaborate system of air transportation corridors began to focus on the metropolitan areas. This system of transportation corridors has created almost daily commuting patterns. Commuting 500 miles in one direction in one day is commonplace, and the result is the system of commuter airlines (P.S.A., Air California, and on a smaller scale, Golden West, Cable, etc.). Until recently Oxnard was relatively isolated from this communications network.

One of the most interesting examples of urban activity center growth has been the development near Orange County Airport. The stimulation provided by Orange County Airport, large land holdings, and major investments which have occurred on the periphery of the airport have been primary growth factors which have attracted considerable additional investment.

Oxnard, today, represents an urban activity area of something less than 100,000 people. However, projections have shown that Oxnard can reasonably expect to grow to over one-half million prior to the year 2000. Thus, a metropolitan perspective and a metropolitan scale of problems and opportunities should form the basis from which city-airport decisions can be reached.

There is every reason to believe that past experience on the United States East Coast will repeat itself in the West Coast area. (That is, one major intercontinental airport will be the focal point of a regional airport system, supplemented by a satellite system of airports capable of receiving cross-continent flights and landing international traffic on an as-necessary basis.) The East Coast example, of course, is the John F. Kennedy Airport in New York City, surrounded by its satellite continental airports composed of La Guardia and Newark. A third hierarchy of general aviation airports supplements the system.

Recently the City of Los Angeles and the City of Ontario reached agreement for Los Angeles to assume operation of the Ontario International Airport. Though Ontario Airport has served as a standby/emergency facility for some time, its status is now official, and significant public capital investment is committed to upgrading and expanding the facility. It has been publicly announced that a second satellite airport may be located in the Antelope Valley, probably in Palmdale, and that a third satellite airport will be sought in the Western Ventura County area.

With this type of system, there is every reason to believe that passengers on the East Coast will make reservations for direct flights into the Western Ventura County area, much as the West Coast traveler has the option today of ticketing to La Guardia or Newark instead of the John F. Kennedy Airport.

Under these circumstances, the opportunity to build a strong web of communication between cities on the West Coast and across the continent lies directly with the decisions to be made by the City of Oxnard and the Ventura County Board of Supervisors. This report strongly recommends that the City accept this challenge, capture the opportunity, and add its influence to those actions necessary to develop a regional airport in the Oxnard Planning Area.

Alternative Sites for the Regional Airport

A number of alternative sites were investigated to determine their potential to accommodate the major airport in western Ventura County. Four alternative locations were studied as follows: (1) Expansion of the Ventura County Airport at Oxnard: (2) Joint use of the Oxnard Air Force Base; (3) Construction of an airport abutting Point Mugu Naval Air Station; (4) Construction of a new airport near the vicinity of the Santa Clara River on Las Posas Valley. Alternative 4 was abandoned early in the study because the high cost of site preparation and obstructions near the Santa Clara River and because a major airport in the Las Posas Valley would conflict with the proposed four-year state college site. Furthermore, investigations with the Federal Aviation Agency led to the conclusion that there was not room in the Oxnard Planning Area for an additional airport location other than the three existing airports.

Figure 4 shows the noise generation characteristic measured in decibels of a four-engine turbojet aircraft. The illustration was derived from a December 1965 FAA study and shows the comparison of the areas which might be subjected to noise levels above 100 decibels intensity from four-engine jet aircraft departing from the proposed runway configurations for the commercial airport of the three alternative site locations. The comparison shows that over 6,400 acres of land might be subject to high intensity (over 100 decibels) noise by aircraft departing from Oxnard Air Force Base while under 1,000 acres of privately owned land would be subjected to the over-100 decibel noise level by such aircraft departing from either the Ventura County Airport at Oxnard or a new airport configuration abutting Point Mugu.

Because of widespread citizen opposition to the approach and departure over the Oxnard Central Area if the Ventura County Airport at Oxnard were expanded to a regional airport, the City Council adopted a policy to encourage the major regional airport to develop on property north of the Naval Air Station at Point Mugu. A system of 10,000 foot parallel runways has been illustrated approximately 5,000 feet northwest of and parallel to the main runway within the Naval Air Station. Although somewhat removed from the existing intense urban activity area, the proposed regional airport is closely related to existing Route 1 Freeway and is within easy driving time of the Central Area and the major industrial centers shown on the General Plan.

The Future of Ventura County Airport at Oxnard

If the existing Ventura County Airport at Oxnard is not to be upgraded to regional status, there are two alternatives for the future of this airport: (1) Sale of the Ventura County Airport with concurring purchase of another site in another area; (2) Retain the Ventura County Airport for general aviation use.

It is recommended that the Ventura County Airport be retained for general aviation use inasmuch as there is a trend to separate lighter and slower aircraft from heavier high speed traffic typified by airlines. For that reason the present airport is proposed to be retained but restricted in its growth to limit its use to general aviation without expansion to permit jet aircraft to be accommodated. The City should support a realistic development timetable to crystalize Ventura County Airport as a general aviation field relocating the air carrier functions to a new regional airport at Point Mugu.

Airport Related Uses

There are two categories of airport related land uses shown on the General Plan. There is a general airport related use designated at the Ventura County Airport at Oxnard and a regional airport related use designated at the proposed regional airport at Point Mugu.

> General Airport Related Uses - this category at the Ventura County Airport is to provide for those uses which compliment a general aviation airport, including the on-base and airport support operations. There are approximately 1,000 acres of general airport and airport related designations on the map. Of this, 200 acres are needed for the airport and approximately 40 acres have been assumed to be acquired for clear zone, leaving about 750 acres for airport related uses. Airport related uses in this category include airtels, airport restaurants, offices of air-related uses, retail and support facilities for recreational flying, residential use with runway access and limited manufacturing of the industrial park type which possibly needs access to the airport. While the airport will provide for commercial and business flying the development of a specific plan for the airport should be such as to encourage the expansion of recreational flying.

Regional Airport Related Uses - this category at the proposed regional airport at Point Mugu is intended to provide for those on-base and support facilities necessary for a regional airport. Approximately 1,900 acres are shown as airport and airport related for the regional airport at the Point Mugu site. FAA standards recommend 1,800 acres minimum be reserved for regional airport and protected areas. Because of its location in an industrial area, the 1,900 acres provides sufficient land to develop the runways, passenger areas, freight areas, aircraft storage and overhaul facilities typical of a regional airport plus some property to be devoted to motels, restaurants and other commercial operations necessary for the efficient operation of the regional airport.

It is doubtful that there will be industry of the processing or manufacturing type enjoying access to the runway because of the necessity to maintain limitations of such access to insure preference for scheduled carriers. If aircraft manufacture or similar industry wishes to locate at the regional airport it could occupy the heavy industrial category and adjustments could be made in the street pattern to provide direct access to the airport. General aviation activities not related to air carrier operations are expected to be discouraged from using regional airports and will be directed to the Ventura County Airport at Oxnard.

LAND USE PLAN

RESIDENTIAL

LOWER LOW DENSITY	2.5 D.U./AC.
UPPER LOW DENSITY	7 D.U./AC.
LOWER MED. DENSITY	13 D.U./AC.
UPPER MED. DENSITY	20 D.U./AC.
HIGH DENSITY	42 D.U./AC.

COMMERCIAL
- CENTRAL BUSINESS DISTRICT
- REGIONAL SHOPPING CENTER
- COMMUNITY COMMERCIAL
- HIGHWAY COMMERCIAL
- SPECIAL
- AIRPORT RELATED

INDUSTRIAL
- LIMITED INDUSTRIAL
- LIGHT INDUSTRIAL
- HEAVY INDUSTRIAL
- PUBLIC UTILITY
- INTERIM INDUSTRIAL

PUBLIC–SEMI PUBLIC
- PUBLIC
- PARKS & OPEN SPACE
- MILITARY

- FREEWAY
- ARTERIAL
- INTERCHANGE
- SCENIC HIGHWAY
- RAILROAD
- STUDY AREA BOUNDARY
- CITY LIMITS BOUNDARY
- PARTIAL INTERCHANGE
- GRADE SEPARATION

OXNARD GENERAL PLAN

GRUEN ASSOCIATES ARCHITECTURE · PLANNING · ENGINEERING

FIGURE 1

DEMAND FOR AIRPORT UTILIZATION

As indicated in the previous section, the Oxnard General Plan recommends that commercial aviation needs for the Oxnard Planning area be conducted at other than the Ventura County Airport at Oxnard, (i.e. at the Naval Air Station at Point Mugu) and that the Ventura County Airport at Oxnard be limited to general aviation without jet aircraft. The proper role for the Ventura County Airport at Oxnard does not permit us to ignore the demands for general aviation use. The Master Plan for General Aviation for Ventura County prepared by Adrian Wilson and Associates develops service areas within which projections for general aviation use are made. That report states the following.[6]

> "Centers of population, convenience to users as it relates to time and geographical restrictions all are instrumental in determining the aviation service areas. This area, therefore, represents a reasonable area that can be served by one or more general aviation airports depending upon demand within that area. Each area can have one or more types of specific demand such as industrial, residential or recreational.
>
> Centers of population . . . are in areas surrounding the communities within Ventura County. The possible areas of expansion through urban growth must be taken into consideration, thereby possibly eliminating a future conflict between the general aviation airport and the community. Establishment of airport operations tends to attract commercial business, and therefore existing land use and zoning plans must be taken into consideration.
>
> Time in relation to convenience to users is defined by the F.A.A. as an airport location lying within a 30 minute time contour for the community served. For the basis of this study, it was assumed that all areas lying within a 15 mile radius of the existing or proposed airport would meet this requirement. In that there are numerous mountain roads within the County, this would represent an average speed of 30 miles per hour which would be conservative for most of the southern section of the County that is important to this study.

The Sulphur Mountain, South Mountain-Oak Ridge, and the Simi Hills all represent natural boundaries as they would affect the aviation service areas. The coastal area and the Santa Monica Mountains are also a natural boundary which would limit the development of that area, thereby relying upon other areas with more suitable terrain.

Taking the above into consideration, the aviation service areas were developed . . . "

"Aviation Service Area I -- The area served by this Service Area represents the largest area in the County outside of the Los Padres National Forest. The area is bounded by the coastline from Rincon Point to Sequit Point, the coastal side of the Santa Monica Mountains, the Oxnard Plains, a portion of the Los Posas Valley, and a portion of the mountainous area north of the city of Ventura. The major communities within the Service Area are Oxnard, Port Hueneme, Ventura and Camarillo. The demand for general aviation services within this area are of all types: Industrial, Commercial, Residential, and Recreational. There exists three operation airports now on the Oxnard Plains, thereby saturating the available airspace. No new airports will be proposed for this service area except a small recreational strip south of the Ventura Marina not proposed for resident aircraft."

The Master Plan for General Aviation for Ventura County makes projections for general aviation use for the County as a whole and within the individual service areas to various time periods. The report states the following.[7]

"The demand for general aviation facilities can be measured in two ways: (1) the number of Federal Aviation Agency (FAA) registered general aviation aircraft can be measured with a factor relating the number of aircraft per 10,000 population, or (2) the utilization of general aviation aircraft and other non-resident general aviation can be measured as operations per resident aircraft.

General aviation is highly related to population. [Pg. 11] shows the relationship of Ventura County and California population to the number of FAA registered general aviation aircraft. The resulting factor of aircraft per 10,000 population

is calculated and illustrated [on Pg. 12] As shown, this factor is rising due to the generally increased popularity of general aviation, the highest per capita and household incomes of the population, and increased leisure time and activity.

Utilization of the projected registered aircraft per 10,000 population ratio yields a resident general aviation aircraft number which should total 394 in 1970, increasing to 534 in 1975, 803 in 1980, and 1,197 in 1985. This projection is most promising, considering the resident aircraft in 1967 totaled 280.

The second measure of general aviation demand, the number of operations per registered aircraft, also serves as a valid indicator of total facility demand. (While, of course, not all operations are by resident aircraft, such a relative factor can adequately be used to predict total general aviation operations.)

Activity reports from Oxnard and Santa Susana Airports indicate approximately 80 operations per permanent aircraft per month (excluding Oxnard Airport's commercial operations.) On this basis, total County operations by general aviation aircraft are projected to amount to 337,900 in 1970, 512,650 in 1975, 770,900 in 1980, and 1,149,100 in 1985. It should be noted that the 1985 figure represents 3,150 operations daily in the total county.

The major factor affecting the potential demand for services within Ventura County is that of aircraft operated out of airports, within the County, by residents living outside of it. Reflection of this potential demand will be described in more detail below and is shown [on pages 13 & 14] as total general aviation aircraft per 10,000 population as differentiated by the above."

The Master Plan of General Aviation for Ventura County includes the discussion of the physical features of the Ventura County Airport, indicates prevailing weather conditions and reports the amount and intensity of activities during September of 1969.

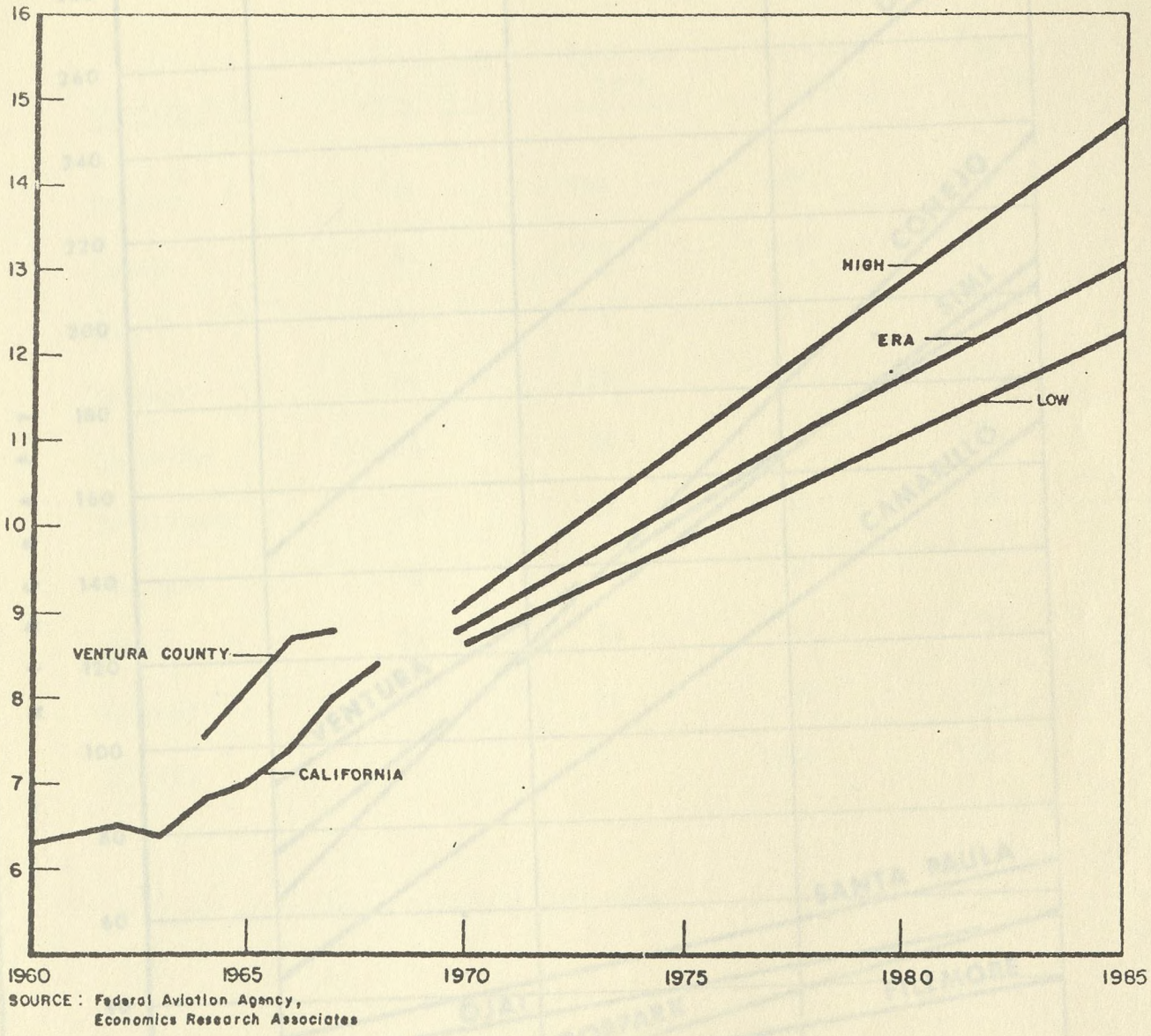
The Master Plan of General Aviation for Ventura County goes on to describe the existing facilities in Aviation Service Area Number I indicating that two airports now exist -- the Ventura County Airport at Oxnard and the

NUMBER OF FEDERAL AVIATION AGENCY
REGISTERED GENERAL AVIATION AIRCRAFT PER 10,000 POPULATION
IN VENTURA COUNTY AND THE STATE OF CALIFORNIA
1960-1985

Year	California Population (000)	Ventura County Population (000)	FAA Registered General Aviation Aircraft			
			California		Ventura County	
			Number	Per 10,000 Population	Number	Per 10,000 Population
1960	15,863.0	199.1	10,022	6.3	n.a.	n.a.
1961	16,453.0	224.0	10,578	6.4	n.a.	n.a.
1962	17,044.0	249.0	11,138	6.5	n.a.	n.a.
1963	17,670.0	272.0	11,389	6.4	212	7.8
1964	18,209.0	293.0	12,303	6.8	n.a.	n.a.
1965	18,726.0	314.5	13,108	7.0	218	7.0
1966	19,132.0	325.0	14,198	7.4	253	7.8
1967	19,478.0	333.0	15,603	8.0	280	8.4
1968	19,782.0	351.1	16,617	8.4	329	9.4
Projected						
1970, Jan.1	20,654.0	389.3	18,382	8.9	394	10.1
1975	23,235.0	513.0	24,164	10.4	534	10.4
1980	26,049.0	680.1	30,738	11.8	803	11.8
1985	29,105.0	900.0	38,710	13.3	1,197	13.3

n.a. means not available

Sources: Federal Aviation Agency, California Department of Finance, and Economics Research Associates

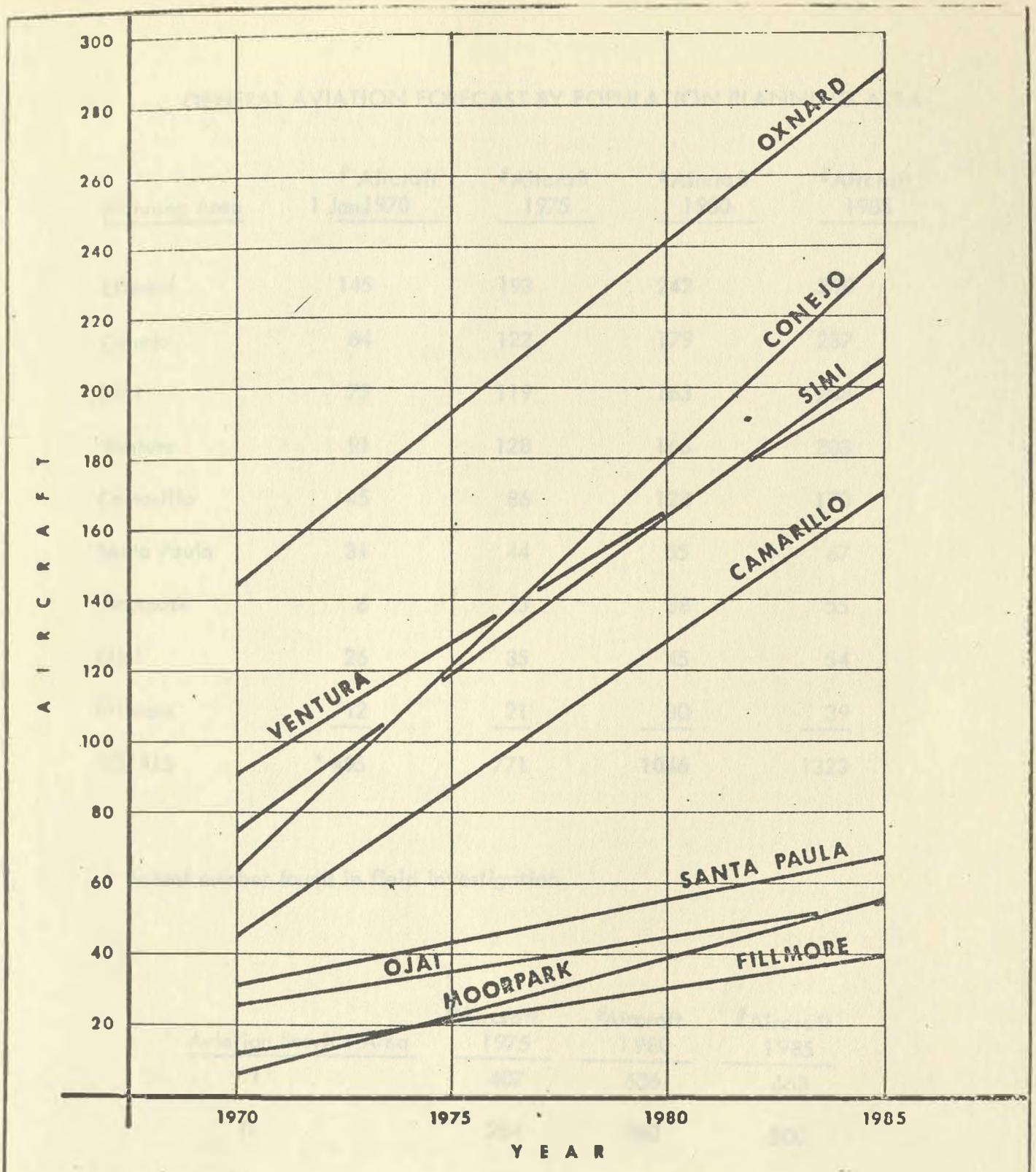


SOURCE: Federal Aviation Agency,
Economics Research Associates

NUMBER OF F. A. A. REGISTERED GENERAL AVIATION AIRCRAFT PER 10,000 POPULATION--VENTURA COUNTY AND CALIFORNIA (1960-1985)

Date: 28 July 1970

Job No. 69-128



GENERAL AVIATION FORECAST BY PLANNING AREA

MASTER PLAN OF GENERAL AVIATION
IN VENTURA COUNTY
FOR VENTURA COUNTY BOARD OF SUPERVISORS

ADRIAN WILSON ASSOCIATES
621 SOUTH WESTMORELAND AVE.
LOS ANGELES, CALIF. 90005
ARCHITECTS, ENGINEERS, PLANNERS AWA
TEL. (213) 386-7070

DATE: 28 July 1970

JOB NO. 69-128

GENERAL AVIATION FORECAST BY POPULATION PLANNING AREA

Planning Area	# Aircraft 1 Jan 1970	#Aircraft 1975	#Aircraft 1980	#Aircraft 1985
Oxnard	145	193	242	290
Conejo	64	122	179	237
Simi	75	119	163	208
Ventura	91	128	166	203
Camarillo	45	86	128	170
Santa Paula	31	44	55	67
Moorpark	6	23	38	55
Ojai	26	35	45	54
Fillmore	12	21	30	39
TOTALS	* 495	771	1046	1323

* Actual number found in field investigation

Aviation Service Area	#Aircraft 1975	#Aircraft 1980	#Aircraft 1985
I	407	536	663
II	264	380	500
III	65	85	106
IV	35	45	54
V	0	0	0
	771	1046	1323

Oxnard Air Force Base. The report indicates that due to air space limitations in the Oxnard plains no new airports should be programmed for this area. The report does make reference, however, to assumptions relative to proposed improvements to the air aviation system as follows:[8]

> "To fulfill the overall objectives of a complete aviation system for the County of Ventura, the regional aspects must be considered also in the proposed improvements to the system. The new airport at Palmdale will be a major international and interstate facility, as will Los Angeles International remain so. As stated by the Board of Supervisors, Oxnard Air Force Base shall be limited to intrastate service and therefore it is recommended that Ojai Area Airport, Sespe Air Park and Tierra Rejada Airport be designated as satellite transportation centers to provide, in addition to general aviation services, shuttle service between themselves and Oxnard Air Force Base, Palmdale and Los Angeles International."

The Master Plan of General Aviation for Ventura County recommends the following improvements to the two airports which exist in Aviation Service Area Number I.[9]

> "Aviation Service Area I -- Present runway capacities of Ventura County Airport - Oxnard and Oxnard Air Force Base shall be capable of handling the projected aircraft through 1975. Dual parallel runway capability should be programmed for the 1975-1980 period for Ventura County Airport - Oxnard to increase the capacity to 320,000 annual operations. An additional dual parallel runway capability is programmed for the 1980-1985 period for Oxnard Air Force Base in the Masterplan thereby allowing growth potential beyond 1985 for this service area."

In a section dealing with the evaluation of the aviation system proposed by the report, the Master Plan of General Aviation to Ventura County states the following concerning Aviation Service Area Number I.[10]

> "Aviation Service Area I -- Evaluation of the two existing airport facilities on the Oxnard Plain have been the subject of many studies. For the basis of this study, it has been assumed that the County will be successful in its acquirement of Oxnard Air Force Base as surplus from the Federal Government. As recommended by the Commercial Aviation Feasibility Study for

Ventura County,28 July 1970, AWA, Oxnard AFB will provide an excellent facility for both commercial and general aviation throughout the 1970 to 1985 time frame of this study. The existing County Airport at Oxnard shall be changed to a General Aviation facility as soon as Oxnard AFB becomes operational and thereby provide two excellent airport facilities in the Oxnard Plain. A third existing facility, Naval Air Station, Pt. Mugu, is also an excellent facility, which if at some future date should become available for joint use or public ownership, would provide an excellent link in the total aviation system of Ventura County. There can be no projection as to when or if this facility would ever become available, therefore for the basis of this study the Naval Air Station, Pt. Mugu, has been considered only as the military complement to the total aviation system of Ventura County. The inclusion of the proposed Marina Airport should be supported by the public as it would bring tourist and recreational dollars into the County for the economic betterment of all. All existing and proposed airports within this Aviation Service Area can be a compatible operation with the communities involved as general aviation facilities have long proved to be good neighbors. During the time frame of this study the existing facilities at Ventura County Airport - Oxnard and Oxnard Air Force Base have both been programmed for expansion to handle the projected growth of general aviation for the Service Area. These two airports form the nucleus of the total aviation system for the County of Ventura, and thereby have first priority in their respective development phase."

LIMITING FACTORS TO AIRPORT OPERATION

Aircraft Safety

An important factor in determining the proper role for an airport is that of the hazard from falling aircraft. While airplane crashes have been infrequent, the ever present possibility of an airplane crashing in the developed portions of the city cannot be discounted. However, the pattern of crashes of light aircraft is for the most part scattered and random to a great degree defying predictability. It should be born in mind that an airport approach over a populated area and schools builds a case against the use of the airport to accommodate faster and inheritantly less stable aircraft.[11]

Noise Exposure Levels--Wyle Laboratories

The most limiting factor concerning compatibility with an airport operation and the abutting land use is noise. Wyle Laboratories performed some noise consulting work for the City of Oxnard during February of 1971 in response to the request by the City Council to assist the city in evaluating the proposed airport agreement between the City and Ventura County.[12] Wyle Laboratories plotted various noise contours on the Ventura County Airport at Oxnard which would be generated by various types of aircraft which might use the airport under various airport roles.

The noise exposure levels plotted by Wyle Laboratories are CNEL. Appendix 1 contains a more complete explanation of the CNEL. To evaluate the CNEL in relationship to the land use proposed by the General Plan, basically no residential use should occur within the 60 CNEL contour under certain conditions (see Appendix 1). Residential land use may occur within the 55 CNEL contour, but no auditoriums, concert halls or places of open assembly should occur within the 55 CNEL noise contour.

School classrooms, libraries, churches, etc. should occur outside of 55 CNEL noise contour but may be located within the 55 CNEL contour if constructed with sound insulation requirements. Figure 2 indicates the estimated noise contours for two-engine turbofan aircraft operations at the Ventura County Airport in Oxnard.[13] Two-engine turbofan jets permitted to create the noise contours of Figure 2 are of the 737 and DC9 type. The contours are based on a straight approach to the airport from the east. The noise contours generated are based on aircraft operations specified in

the report by Adrian Wilson and Associates of October 8 to the Ventura County Board of Supervisors. Basically the aircraft operations plotted would include:[14]

1. Twenty-eight daily operations of 737 or DC-9.
2. Twenty-six daily operations of twin otters.
3. Three hundred and six daily operations of non-jet general aviation aircraft.

Wyle Laboratories also prepared a graphical comparison of the magnitude of noise levels from commercial jet operations compared to other everyday levels of noise experienced by the average person. The comparison is shown in the following table made in terms of relative noise level with the 0 on the scale taken arbitrarily as the general aviation aircraft of which people in Oxnard will be the most familiar.[15]

	Aircraft Type	Relative Sound Level, dB (on take-off Power)
1)	General aviation aircraft (non-jet, based on the mix which is a nation-wide average)	0
2)	2-engine piston-prop aircraft, under 12,500 lb gross weight	9
3)	4-engine turboprop aircraft (including 50-passenger STOL)	11
4)	Future high bypass ratio 3-engine turbofan aircraft (L-1011, DC-10 technology)	16
5)	Future high bypass ratio 2-engine turbofan aircraft (L-1011, DC-10 technology	18
6)	Current 2-engine turbofan aircraft (737, DC-9)	19
7)	Current business jets	20
8)	Current 3-engine turbofan aircraft (727)	21
9)	Current 4-engine turbofan aircraft (707, DC-8)	24
10)	F-106 military jets (on afterburner)	32

Wyle Laboratories also plotted the CNEL contours for non-jet general aviation activity only. These noise contours are shown on our Figure 3. Note that for case C which is 810 average daily operations the 55 CNEL line falls almost at

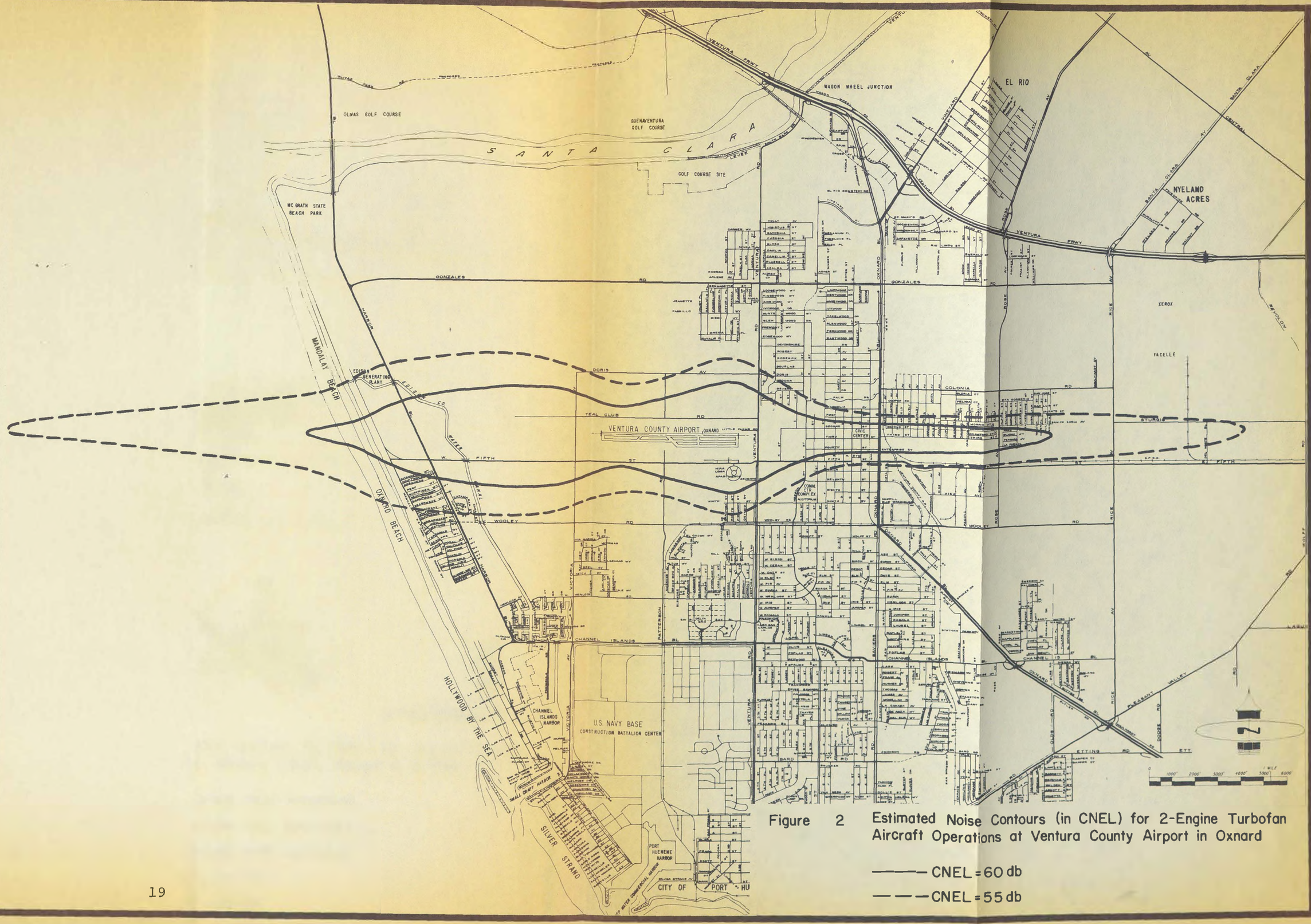


Figure 2 Estimated Noise Contours (in CNEL) for 2-Engine Turbofan Aircraft Operations at Ventura County Airport in Oxnard

———— CNEL = 60 db

— — — CNEL = 55 db

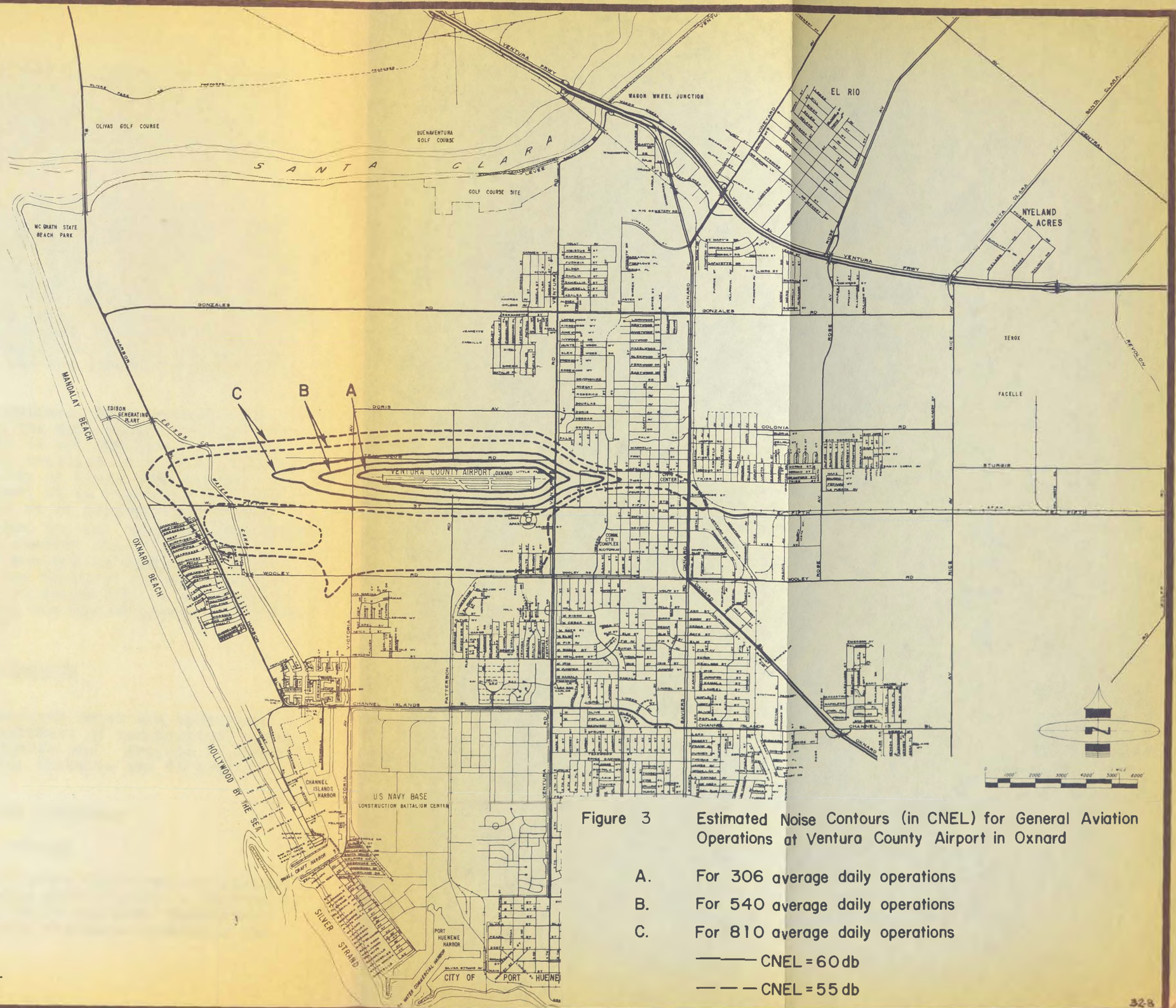


Figure 3 Estimated Noise Contours (in CNEL) for General Aviation Operations at Ventura County Airport in Oxnard

A. For 306 average daily operations

B. For 540 average daily operations

C. For 810 average daily operations

——— CNEL = 60 db

— — — CNEL = 55 db

32-8

Wooley Road. This would mean that no auditorium or places of open assembly could occur between Wooley Road and Fifth Street and that school uses could occur in this area only with sound attenutation. Residential uses could occur within this area. For case B, which is 540 average daily operations, the 55 CNEL contour falls approximately 250 feet south of Fifth Street.[16]

Wyle Laboratories recommended that the constrain of no jets plus the limit on the size of propellor aircraft using the airport be instituted for proper noise control. Wyle Laboratories recommends the following to serve as a definition to assist in clarification of the point of the probition of jet aircraft. "The term jet aircraft as used herein means and includes all fixed-wing aircraft powered by pure turbojet or by turbofan engines, whether used for commercial or private purposes. The term 'non-jet aircraft' means all other aircraft and specifically includes all aircraft powered by piston engines and propellors and all aircraft powered by turboprop engines."[17]

With respect to single noise contours, Wyle Laboratories states the following. "Due to the wide range of noise levels that can be expected, it is not practical to set single-event limits for general aviation (non-jet) traffic at this time. Again, if the City of Oxnard desires to proceed with a monitoring system, it is suggested that the single-event monitors be placed at no greater than 10,000 feet from the brake release point (on the extended centerline) for take-off monitoring and no greater than 3,000 feet from the landing threshold for monitoring approach noise. Final limits should be set on the basis of several months (preferably at least 6 months) or recordings to establish practical limits appropriate for the mix of general aviation aircraft using this airport."[18]

Noise Exposure Levels--State Standards

The State has adopted noise standards which are contained in Subchapter 6 of Title 4, Department of Aeronautics, which is a portion of the Business Regulations. Article I, General, of the Noise Standards subchapter contains the following preamble.[19]

SUBCHAPTER 6. NOISE STANDARDS

Article 1. General

5000. Preamble. The following rules and regulations are promulgated in accordance with Article 3, Chapter 4, Part 1, Division 9, Public Utilities Code (Regulation of Airports) to provide noise standards governing the

operation of aircraft and aircraft engines for all airports operating under a valid permit issued by the department. These standards are based upon two separate legal grounds: (1) the power of airport proprietors to impose noise ceilings and other limitations on the use of the airport, and (2) the power of the state to act to an extent not prohibited by federal law. The regulations are designed to cause the airport proprietor, aircraft operator, local governments, pilots, and the department to work cooperatively to diminish noise. The regulations accomplish these ends by controlling and reducing the noise in communities in the vicinity of airports.

NOTE: Authority cited: Section 21669, Public Utilities Code. Reference: Sections 21669-21669.4 Public Utilities Code.

HISTORY: 1. New Subchapter 6 (5000-5006, 5010-5014, 5020-5025, 5030-5032, 5040, 5045-5048, 5050, 5055, 5060-5064, 5065, 5070, 5075, 5080, 5080.1-5080.5) filed 10-25-70; designated effective 12-1-71 (Register 70, No. 48).

Section 5005, Findings, states the following.[20]

5005. Findings. Citizens residing in the vicinity of airports are exposed to the noise of aircraft operations. There have been numerous instances wherein individual citizens or organized citizen groups have complained about airport noise to various authorities. The severity of these complaints has ranged from a few telephone calls to organized legal action. Many of these cases have been studied by acoustics research workers under sponsorship of governmental and private organizations. These studies have generally shown that the severity of the complaint is principally associated with a combination of the following factors:

(a) Magnitude and duration of the noise from aircraft operations;

(b) Number of aircraft operations; and

(c) Time of occurrence during the day (daytime, evening or night).

There are many reasons given by residents for their complaints; however, those most often cited are interference with speech communication, TV, and sleep. A number of studies have been made related to speech and hearing damage, and some studies have been made related to sleep disturbance and other physiological effects. These studies provide substantial evidence for the relationship between noise level and its interference with speech communication and its effect relative to hearing loss. Significantly less information is available from the results of sleep and physiological studies.

In order to provide a systematic method for evaluating and eventually reducing noise incompatibilities in the vicinity of airports, it is necessary to quantify the noise problem. For this purpose, these regulations establish a procedure for defining a noise impact area surrounding an individual airport. The criteria and noise levels utilized to define the boundaries of the noise impact area have been based on existing evidence from studies of community noise reaction, noise interference with speech and sleep, and noise induced hearing loss.

One of the fundamental philosophies underlying the procedures in these regulations is that any noise quantity specified by these regulations be measurable by relatively simple means. Therefore, these regulations utilize as their basic measure the A-weighted noise level, which is the most commonly accepted simple measure. To insure consistency between criteria and measurement, the units for the criteria are also based on the A-weighted sound level rather than one of the several more complex perceived noise levels.

These regulations provide a procedure to limit the allowable noise for an individual aircraft flyby measured at specified points in the vicinity of the airport. The noise limits are specified in terms of the class of aircraft and measurement location.

The level of noise acceptable to a reasonable person residing in the vicinity of an airport is established as a community noise equivalent level (CNEL) value of 65 dB for purposes of these regulations. This criterion level has been chosen for reasonable persons residing in urban residential areas where houses are of typical California construction and may have windows partially open. It has been selected with reference to speech, sleep and community reaction.

It is recognized that there is a considerable individual variability in the reaction to noise. Further, there are several factors which undoubtedly influence this variability and which are not thoroughly understood. Therefore, this criterion level does not have a degree of precision which is often associated with engineering criteria for a physical phenomenon (e.g. the strength of a bridge, building, et cetera). For this reason, the state will review the criterion periodically, taking into account any new information which may become available.

Article 2 entitled "Airport Noise Limits" sets forth the following as its purpose, methodology for controlling and reducing noise problems, and airport noise criteria.[21]

Article 2. Airport Noise Limits

5010. Purpose. The purpose of these regulations is to provide a positive basis to accomplish resolution of existing noise problems in communities surrounding airports and to prevent the development of new noise problems. To accomplish this purpose, these regulations establish a quantitative framework within which the various interested parties (i.e. airport proprietors, aircraft operators, local communities, counties and the state) can work together effectively to reduce and prevent airport noise problems.

5011. Methodology for Controlling and Reducing Noise Problems. The methods whereby the impact of airport noise shall be controlled and reduced include but are not limited to the following:

(a) Encouraging use of the airport by aircraft classes with lower noise level characteristics and discouraging use by higher noise level aircraft classes;

(b) Encouraging approach and departure flight paths and procedures to minimize the noise in residential areas;

(c) Planning runway utilization schedules to take into account adjacent residential areas, noise characteristics of aircraft and noise sensitive time periods;

(d) Reduction of the flight frequency, particularly in the most noise sensitive time periods and by the noisier aircraft;

(e) Employing shielding for advantage, using natural terrain, buildings, et cetera; and

(f) Development of a compatible land use within the noise impact boundary.

Preference shall be given to actions which reduce the impact of airport noise on existing communities. Land use conversion involving existing residential communities shall normally be considered the least desirable action for achieving compliance with these regulations.

5012. Airport Noise Criteria. Limitations on airport noise in residential communities are hereby established.

(a) The criterion community noise equivalent level (CNEL) is 65 dB for proposed new airports and for vacated military airports being converted to civilian use.

(b) Giving due consideration to economic and technological feasibility, the criterion community noise equivalent level (CNEL) for existing civilian airports (except as follows) is 70 dB until December 31, 1985, and 65 dB thereafter.

(c) The criterion CNEL for airports which have 4-engine turbojet or turbofan air carrier aircraft operations and at least 25,000 annual air carrier operations (takeoffs plus landings) is as follows:

Date	CNEL in decibels
Effective date of regulations to 12-31-75	80
1-1-76 to 12-31-80	75
1-1-81 to 12-31-85	70
1-1-86 and thereafter	65

Note that the CNEL contour which is deemed to be compatible with existing civilian airports (due to economic and technological feasibility considerations) is the 70 dB until December 31, 1985 and 65 dB thereafter. For proposed new airports and for vacated military airports being converted to civilian use, 65 dB is considered the CNEL contour for establishing compatibility with residential communities. It is important to observe that Wyle Laboratories are more conservative and feel that residential uses without sound attenuation should occur only within the 60 CNEL contour as opposed to the 65 CNEL contour.

The State regulations go on to describe the noise impact boundary and the noise impact area as being that area within the 70 CNEL contour for an existing civilian airport prior to December 31, 1985. Section 5014 indicates the following land uses as being compatible within the noise impact boundary.[22]

(a) Agriculture

(b) Airport property

(c) Industrial property

(d) Commercial property

(e) Property zoned to an avigation easement for noise

(f) Zoned open space

(g) High rise apartments in which adequate protection against exterior noise has been included in the design and construction together with a central air conditioning system.

Article 3 of the State regulations indicates the method of establishing and validating noise impact boundaries for airports required to monitor.

Article 4 contains measurement of single event noise exposure levels. Article 5 specifies a single event noise limits. It states the following.[23] (Emphasis added:)

Article 5. Single Event Noise Limits

5035. Maximum Single Event Noise Exposure Levels. The proprietor of each airport which is required to perform noise monitoring shall recommend to the department the single event noise exposure level limits appropriate to his airport. In no event shall the limits recommended by the airport proprietor exceed the values in Figures 3A and 3B which correspond to the noisiest aircraft class utilizing the airport on a recurrent basis (which shall mean an average of at least two aircraft operations per day) during the six-month period prior to the determination that the airport has a noise problem (Section 5050). The values in Figures 3A and 3B are based on maximum gross weight operation without noise abatement flight procedures under standard atmospheric conditions at sea level. Air proprietors are therefore encouraged to recommend lower limits. Upon approval of such limits at a specific airport, those limits will be enforced by the county in accordance with this entire subchapter of these regulations.

Article 7 deals with noise monitoring system requirements; Article 8 is entitled "Implementation by Counties"; Article 9 is entitled "Implementation by Aircraft Owners"; Article 10 is entitled "Implementation by Airport Proprietors"; and Article 11 is entitled "Implementation by the Department" meaning the Department of Aeronautics, State of California. Article 12 contains a schedule of implementation; Article 13 describes variances that may be granted to the noise standards and Article 14 contains specifications for noise monitoring systems.

It is significant to note that Section 5022 of Article 3 requires that a County monitor the noise at an airport where airports have 1,000 or more homes within the noise impact boundary based on a CNEL of 70 dB. If this situation does not exist, then the county shall require noise monitoring by the airports within the boundaries that are deemed to have a noise problem as determined by the county. In making a determination that a noise problem exists around an airport, the County shall:[24]

(1) Investigate the possible existence of a noise impact area greater than zero based on a CNEL of 70 dB, and determine whether or not people actually reside inside the noise impact boundary;

(2) Review other information that it may deem relevant, including but not limited to complaint history and legal actions brought about by aircraft noise; and

(3) Coordinate with, and give due consideration to the recommendation of, the county airport land use commission (as defined in Public Utilities Code Section 21670).

CONCLUSIONS

Projected Airport Use Does Not Exceed Compatible Noise Contours

The population projections used by Adrian Wilson and Associates in preparing the Master Plan for General Aviation for Ventura County were based on a study by Economic Research Associates performed in December of 1969. The County has since reduced their population projections below those used by Adrian Wilson. We may assume then that the projections for the need for general aviation quoted in this report are optimistic. However, using Adrian Wilson's projections note from page 14 of this report that for Aviation Service Area I, 407 resident aircraft are projected for 1975, 536 by 1980 and 663 by 1985. Aviation Service Area I includes the cities of Oxnard, Ventura, Camarillo and Port Hueneme. For the Oxnard planning area alone, 193 resident aircraft are projected for 1975, 242 by 1980 and 290 by 1995.[25]

Based on the recent application to the General Services Administration by the City of Camarillo for limited airport use at the Oxnard Air Force Base, we will make the assumption that the general aviation forecast for Service Area I will be split equally by the Oxnard Air Force Base and the Ventura County Airport at Oxnard. This would provide approximately 268 resident based aircraft at each airport in 1980 and approximately 331 resident aircraft at each airport by 1985. Based on 600 annual operations per resident aircraft[26], this would produce 160,800 total flights per year in 1980 and 198,900 per year in 1985. The average daily operations would be 440 in 1980 and 546 in 1985. Therefore, the projected general aviation use at the Ventura County Airport at Oxnard in 1980 would be well within the Case B noise contours drawn by Wyle Laboratories and the projected use in 1985 would just barely exceed the Case B noise contours. Case B on Figure 3 of this report shows the noise contours for 540 average daily operations. Note that for Case B the 60 CNEL contour within which no residential use should occur lies 100 feet north of West Fifth Street and the 55 CNEL contour within which no assembly or school without sound attenuation should occur extends south of West Fifth Street only 250 feet.[27] *For the proposed general aviation use of Service Area I split equally between Oxnard Air Force Base and the Ventura County Airport at Oxnard, there would be complete compatibility with the Land Use Element of the Oxnard General Plan,* provided the recommendations of Wyle Laboratories relative to types of aircraft are observed.

Existing Airport Facilities Should Not Be Expanded

A single runway for general aviation use with the usual hangers, tie down and other support facilities will accommodate about

350 resident aircraft.[28] These airplanes would generate approximately 210,000 flights annually or 575 average daily flights. This would just exceed Case B but would fall far short of Case C on Figure 3 of this report. *Therefore, the optimum use of the Ventura County Airport at Oxnard (without expansion) for general aviation use would fall within a noise contour which is compatible with existing Land Use Element of the Oxnard General Plan.*

Conversely, if the second runway were built to accommodate 700 resident aircraft, 420,000 annual flights would be generated and 1,150 average daily flights would occur.[29] This would produce a noise contour which would exceed Case C and would not be compatible with the Land Use Element of the Oxnard General Plan. The noise contour which is compatible with the Land Use Element of the General Plan based on the present aircraft approach pattern would lie some place between Case B and Case C. Case C which is 810 flights a day produces a 55 CNEL noise contour which extends almost as far south as Wooley Road. Schools, libraries, churches, hospitals, nursing homes, etc. are considered incompatible uses within the 55 CNEL contour without sound attenuation. While dwellings are considered a compatible use within the 55 CNEL without sound attenuation, the fact that the whole neighborhood is subjected to noise of this magnitude coupled with the fact that schools, churches and other uses normally found in a residential neighborhood would have to have sound attenuation would mitigate against the construction of good residential neighborhoods between Fifth Street and Wooley Road. The 350 resident aircraft producing about 575 average daily flights would create a 55 CNEL noise contour which would cover less of these residential neighborhoods and would permit them to develop in the manner and with facilities recommended by the General Plan.

It should be pointed out that the length of the runway is presently excessive for the needs for general aviation with limited aircraft. The noise contours over property shown for future residential use east of Ventura Road would be reduced if the existing runway were shortened to 3,600 feet by eliminating approximately 1,300 feet of existing runway at the east end. Although the 60 CNEL noise contour on both Case B and Case C extends somewhat easterly of Ventura Road, this area is proposed for high density residential use on the General Plan including high rise structures which normally are constructed with sound attenuation and air conditioning. Eliminating the easterly 1,300 feet of the runway and moving the point of landing and departure that distance to the west would create a less intense noise contour east of Ventura Road and would reduce any limitation to the height of proposed residential uses which might now exist based on the glide path approach.

At the present time the only real limiting factor which prevents heavier aircraft with undesirable noise characteristics from using the 5,900 foot runway is the fact that its bearing capacity is not sufficient to carry such aircraft. In the County's Capital Improvement Program, the strengthening of the existing runway is proposed for 1973-74. Once the runway reinforcement occurs, the City of Oxnard without proprietary rights will have great difficulty in preventing more noisy aircraft from using the field. *The City of Oxnard should adopt the position that the runway will not be reinforced and that it will be shortened to accommodate only the lighter planes with desirable noise characteristics in the general aviation fleet. The otters which presently provide third level airport service to Los Angeles International Airport can operate on the 3,600 foot runway without reinforcement.*

Prohibition of Jet Aircraft Recommended

The Oxnard General Plan now recommends that no jet aircraft be permitted at the Ventura County Airport at Oxnard. Wyle Laboratories reiterates that recommendation.[30] Note that on page 24 of this report, Section 5011 of the Noise Standards of the Department of Aeronautics states that to control the impact of noise the use of the airport should be encouraged by aircraft classes with lower noise level characteristics and the use of the airport should be discouraged by higher noise level aircraft classes. Airports at Fullerton and El Monte have prohibited jet aircraft operation.[31] *The City of Oxnard should officially reiterate its stand that no jet aircraft be permitted at the Ventura County Airport at Oxnard.*

Trunk Line Service May Be Retained Temporarily

The Oxnard General Plan proposes that the schedule airlines and other commercial services be located other than at the Ventura County Airport at Oxnard, e.g. at the airport at the Naval Air Station at Point Mugu. The Ventura County Airport at Oxnard presently operates as a trunk line station on a north-south coastal air carrier route. The aircraft presently in use is a twin engine turbo-prop (F-27 or equivalent). This aircraft generates no noise problems presently and could remain without adverse effects on the land use pattern proposed by the Oxnard General Plan until such time as a combination of increased general aviation flights plus the increase of trunk line flights exceeds the noise contours recommended by Wyle Laboratories.

Third Level Service May Be Retained Indefinitely

The Ventura County Airport at Oxnard has also become a third level airport with service into Los Angeles International

Airport. The aircraft performing this function is presently a twin engine otter which also does not provide any serious noise impact. If there is no change of aircraft, this third level airline service could be accommodated through the ultimate life of the airport without exceeding the recommended noise contour by Wyle Laboratories.

Airport Approach Pattern Should Be Altered

Section 5011 of the Airport Standards of the Department of Aeronautics states that we should encourage approach and departure flight paths and procedures to minimize the noise in residential areas. The Land Use Element of the General Plan now proposes airport related uses north of the airport. With the closure of Teal Club Road these airport related uses could have direct access to the airport facilities. Conversely, the area south of the airport between Fifth Street and Wooley Road is proposed for residential uses. The continued importance of Fifth Street as a primary arterial street prohibits the interconnection of the area between Fifth Street and Wooley Road with the airport facilities.

The airport approach pattern for the Ventura County Airport at Oxnard is counter-clockwise and small planes fly over this proposed residential area between Fifth Street and Wooley Road. The noise contours plotted by Wyle Laboratories take this fact into consideration. If the Oxnard Air Force Base at Camarillo is not to be used for air carrier operations and instrumentation is therefore unlikely then the airport approach pattern at the Ventura County Airport at Oxnard could be reversed to a clockwise direction so that the aircraft approach would be over the Airport Related area between Doris Avenue and the airport as opposed to approaching over the residential area between Fifth Street and Wooley Road. In the event there is instrumentation to permit the landing of heavier aircraft at Oxnard Air Force Base this reversal of the flight pattern will not be possible, because the center-line of the runways of the two airports are only 4,500 feet apart.[32] However, should the Oxnard Air Force Base at Camarillo be operated for general aviation use and be limited to light planes, there will be no conflict with the clockwise approach pattern because the airports are separated in an east-west direction by some six miles.

SUMMARY

CNEL noise contours which would insure compatibility with both the substance and the spirit of the Oxnard General Plan would require an operation of the Ventura County Airport at Oxnard which would produce a noise contour somewhere between Case B and Case C plotted by Wyle Laboratories based on the present counter-clockwise approach pattern. Utilization of the single runway for general aviation purposes accommodating 350 resident aircraft would generate approximately 575 average daily flights which would be compatible with the Land Use Element of the General Plan.

If the Oxnard Air Force Base is used for light aircraft and does not require instrumentation, then it is recommended that the flight path be reversed to a clockwise motion so the aircraft approach to the airport is over the airport related uses north of the Ventura County Airport at Oxnard as opposed to approaching the airport over the residential uses between Fifth Street and Wooley Road. Although the 575 flights a day would create a noise contour not incompatible with residential use between Fifth Street and Wooley Road, the reversed approach pattern should add a safety factor to residential use south of the airport that would make those neighborhoods more desirable for residential occupancy.

Adding a second runway plus the necessary support facilities at the Ventura County Airport at Oxnard would increase the airport capacity to 700 resident based aircraft and would provide a noise contour that would be incompatible with the Land Use Element of the General Plan even with a reversed aircraft approach. Therefore, a second runway at the airport is not recommended.

Furthermore, if the airport is to be used only for general aviation and is to accommodate only the smaller aircraft in order to produce desirable noise contours as recommended by Wyle Laboratories, then consideration should be given to shortening the runway and the reinforcement of the existing runway which would permit larger planes to land should be opposed by the City of Oxnard.

It is recommended that the airport portion of the General Plan included in the second section of this report be amended to specifically call out the role for the airport that is compatible with the Land Use Element of the General Plan and that would provide a limited airport operation which would be satisfactory to the vast majority of the citizens residing in the City of Oxnard.

APPENDIX I: The CNEL As a Measurement of Noise Level

THE CNEL AS A MEASUREMENT OF NOISE LEVEL[31]

The CNEL measurement is a cumulative measure of a noise exposure at any given point and accounts for the magnitude and duration of noise for each aircraft operation as well as the total number. The measurement includes a weighting factor for time of day which causes airport operations during the evening to count three times as much as during the day time (7:00 a.m. - 7:00 p.m.) and night time flights (10:00 p.m. - 7:00 a.m.) to count 10 times as much as day time flights. For a given nominal level of aircraft operations, seasonal predictions of the expected value of the CNEL can be made and contour lines drawn around an airport which represent constant values of the expected CNEL measurement, then by actually measuring the CNEL that points along this boundary, the airport proprietor can determine if his operations do not generate an accumulated noise exposure greater than the planned limits. This cumulative measure of noise can be considered analogous to a fixed supply of funds with which one must operate each day. Just as one would "spend" this budget by one or more withdrawals which total the maximum available, so would an airport proprietor have a noise budget measured in terms of the CNEL scale which he could expend by one noisey operation or several less noisy operations.

The CNEL measurement by itself cannot control the noise levels of a single flight. It does not control the maximum accumulation of noise. The maximum noise level of a single flight is controlled by specifying a noise limit on single events. Instrumentations used for single events can also be employed for CNEL measurements.

The tables on the following pages indicate the land use compatibility within the various CNEL noise contours.

LAND USE COMPATIBILITY GUIDE FOR NEW DEVELOPMENT
IN AN AIRCRAFT NOISE ENVIRONMENT

Land Use Category	Noise Sensitivity Code[1]	Approximate CNEL Range for Compatible Use 55 60 65 70 75 80 85 90
1. Residential - Single and Two Family Homes, Mobile Homes	1	A
2. School Classrooms, Libraries, Churches, Hospitals, Nursing Homes, et cetera	1	A B
3. Auditoriums, Concert Halls, Outdoor Amphitheaters, Music Shells	1	D
4. Residential - Multiple Family Apartments, Dormitories, Group Quarters, Orphanages, Retirement Homes, et cetera	2	A B
5. Transient Lodging - Hotels, Motels	3	A B C
6. Playgrounds, Neighborhood Parks	3	A
7. Sports Arenas, Out-of-door Spectator Sports	3	D
8. Office Buildings, Personal, Business and Professional Services	3	A B C
Commercial - Retail, Movie Theaters, Restaurants	3	
Manufacturing - Noise Sensitive/	3	
Communications - Noise Sensitive	3	
9. Golf Courses, Riding Stables, Water-Based Recreational Areas, Cemeteries	4	A
Livestock Farming, Animal Breeding	4	
10. Commercial - Wholesale & Some Retail, Industrial/Manufacturing, Transportation, Communications & Utilities	5	A B C
11. Agriculture (Except Livestock Farming) Mining, Fishing	5	A

Descriptors A, B, C and D are defined on page 2 of Exhibit "C".

LAND USE CODING/CONSTRUCTION TYPE DESCRIPTORS

A. Specified land use is satisfactory, based on the assumption that any buildings involved are of normal construction, without any special noise insulation requirements.

B. New development or construction should be permitted only on condition that a detailed analysis of requirements for building noise reduction performance be made and indicated noise insulation and air supply features be included in the design and construction.

C. New development or construction should be undertaken only if (1) it is directly related to airport activities or services, and (2) special noise insulation and air supply features are included in the design and construction.

D. A detailed analysis of the noise environment, considering noise from all urban and transportation sources should be made, and needed noise insulation features and/or special requirements for sound reinforcement systems should be included in the basic design.

Construction Type Descriptor B corresponds to a reduction of noise level (exterior to interior) of 35 decibels on the A-scale; and Construction Type Descriptor C to a reduction of noise level (exterior to interior) of 45 decibels on the A-scale. Agencies having jurisdiction over building standards shall treat these values as performance standards and shall require the owner of the building to show compliance by submitting engineering data or results of field tests in the completed building.

APPENDIX II: Human Reaction to Noise

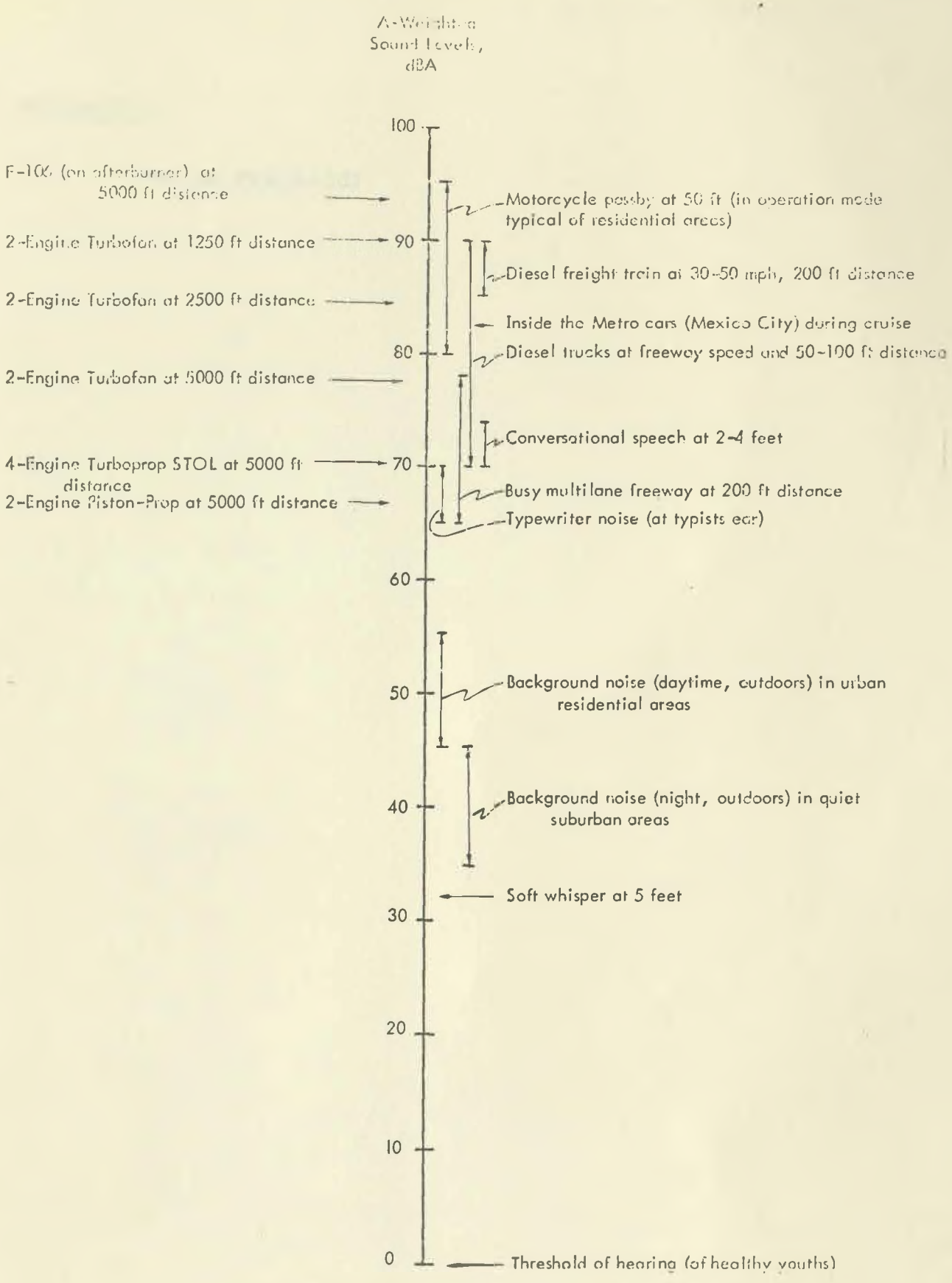
HUMAN REACTION TO NOISE[32]

In their contract with the City of Oxnard, Wyle Laboratories discussed the concept of noise as it is individually perceived. They state the following. "By way of background, let us first explain that when a person is comparing two sounds, he will usually be unable to hear a difference (or a change in sound level) less than 3 dB, even when the two sounds are similar in frequency content and may be played for him in succession to facilitate the comparison. For many people, a change of 5 dB is necessary before a listener will perceive a difference. However, when the difference becomes as large as 10 dB, many persons will judge the sound having the higher sound level to be about twice as loud as the other. This will place in perspective for you the importance (or unimportance) of a given difference between two sound levels."

***

"It will be noted that there is a large difference between the turboprop and the jet aircraft and an extremely large difference between the civilian jets and the military jet. This kind of comparison, with all aircraft at the same distance from the observer, fails to take account of the differing climb profiles of the various aircraft types, which will in practice result in differing distances to a given ground point. If this were taken into account, the general aviation aircraft and the STOL aircraft would appear even more quiet to the others, because of their climb profiles.

"Second, let us select certain of these aircraft most of interest to the present case, and compare their sound levels with other sounds to which most of us are exposed daily. Since we are now concerned with two airports, it is not possible to select a single point on the ground in Oxnard (or a smaller number of points) and specify the sound levels produced there by each aircraft type, because that will depend on the position of the particular point(s) selected with respect to the two airports. Instead, we have shown the aircraft sound levels for several observer distances which would be typical in Oxnard. This is true of the distances selected for the comparison sounds also. One may make a conversion of these sound levels to what would be experienced by an observer at other distances, by applying the approximate rule that the sound level decreases about 6 dB for each doubling of the distance."



. COMPARISON OF PROSPECTIVE AIRCRAFT SOUNDS* WITH OTHER FAMILIAR SOUNDS

* All aircraft on takeoff power.

FOOTNOTES

(To Be Prepared)