# SISKIYOU COUNTY GENERAL PLAN

# NOISE ELEMENT

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| | |
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| Terra Scan | 1725 Oregon Street<br>Redding, CA 96001 |

RESOLUTION NO. 454, BOOK 8

RESOLUTION OF THE BOARD OF SUPERVISORS OF THE COUNTY OF SISKIYOU, STATE OF CALIFORNIA, ADOPTING A NOISE ELEMENT FOR THE SISKIYOU COUNTY GENERAL PLAN FOR SAID COUNTY.

WHEREAS, the Siskiyou County Planning Commission by its minute order did on the 6th day of December 1978 recommend adoption of a proposed Noise Element for the Siskiyou County General Plan, and

WHEREAS, an Environmental Impact Report was prepared, reviewed and certified as completed, and

WHEREAS, the Board of Supervisors did set a Public Hearing on the 8th of May and continued this Public Hearing to the 21st day of May, notice thereof having been given as prescribed by law, and at which time all interested persons were afforded the opportunity to be heard thereon, and

WHEREAS, all comments, requests and suggestions received at said hearings were given due and deliberate consideration in connection with the objectives and purposes of the proposed element, now

THEREFORE BE IT RESOLVED, by the Board of Supervisors of the County of Siskiyou in regular session assembled this 21st day of May 1979 that the Noise Element of the Siskiyou County General Plan be and is hereby adopted as a part of the General Plan for the County of Siskiyou, and

BE IT FURTHER RESOLVED that the Planning Director is directed and authorized to certify the Noise Element to any concerned agencies.

The foregoing resolution was introduced by Supervisor Torrey who moved its adoption, and seconded by Supervisor McArdle and adopted by the following roll call vote:

AYES: Supervisors McArdle, Zink, Wacker and Torrey.

NOES: None.

ABSENT: None.

Whereupon the Chairman declared the above and foregoing resolution duly adopted and

SO ORDERED.

Mike Belcastro

Chairman, Board of Supervisors

ATTEST: Norma Price, County Clerk

Rae Turkovsky

by Clerk of the Board of Supervisors

SEAL

SISKIYOU COUNTY PLANNING COMMISSION

COUNTY OF SISKIYOU STATE OF CALIFORNIA

DECEMBER 6, 1978

PRESENT: Commissioners Cannon, Cedros, Muma, Lange, Nilsson and Steinhaus

ABSENT: Commissioners Martin, Hillery and Heidewald

ALSO PRESENT: David G. Hedberg, Planning Director; Robert Sellman, Assistant Planning Director; Jack Anderson, Department of Public Works; Don Carey, Assessor's Office

ENVIRONMENTAL IMPACT REPORT- SISKIYOU COUNTY GENERAL PLAN GENERAL PLAN ADOPTION — APPROVED

STAFF REPORT: This application is for the proposed revisions of the Land Use, Noise, and Circulation Elements of the Siskiyou County General Plan and the proposed adoption of the Land Use, Circulation, and Noise Elements of the General Plan. The Planning Department recommends the Commission certify the Environmental Impact Report for the Land Use, Circulation, and Noise Elements of the General Plan. The Planning Department recommends the Commission certify the Environmental Impact Report for the Noise and Circulation Elements as complete.

PUBLIC INPUT: None

MOTION: It was moved by Martin, seconded by Lange to certify the Environmental Impact Report for the Noise and Circulation Elements. VOTED upon and passed unanimously.

STAFF REPORT: The Planning Department recommends approval of the Environmental Impact Report for the Noise Element as complete.

MOTION: It was moved by Martin, seconded by Cedros to approve the Environmental Impact Report for the Noise Element as complete with the minor typographical corrections. VOTED upon and the Chairman declared the motion passed.

STAFF REPORT: The Planning Department recommends approval of the Noise Element of the Siskiyou County General Plan.

PUBLIC INPUT: None

MOTION: It was moved by Martin, seconded by Cedros to recommend approval of the Noise Element to the Board of Supervisors. VOTED upon and the Chairman declared the motion passed with the following roll call vote:

AYES: Cannon, Cedros, Nilsson, Muma and Lange
NOES: None
ABSENT: Martin, Hillery and Heidewald

STATE OF CALIFORNIA
COUNTY OF SISKIYOU

I, Shirlee House, Planning Department Stenographer and Clerk of the Siskiyou County Planning Commission do hereby certify the foregoing to be a full, true, and correct copy of the minute order of said Siskiyou County Planning Commission passed on December 6, 1978.

Shirlee House

Shirlee House, Clerk

SISKIYOU COUNTY
NOISE ELEMENT

TABLE OF CONTENTS

# CHAPTER 1

## INTRODUCTION

This introductory chapter provides the legal basis for the Siskiyou County Noise Element as part of the General Plan, indicates the direction intended for this document and describes the planning area and its noise relationships.

The Noise Element provides a basis for evaluating and controlling environmental noise and for protecting county residents from excessive noise exposure. The primary goals intended for this Noise Element are outlined as follows:

1. To provide sufficient information concerning the community noise environment so that noise may be seriously considered in the land use planning process. Noise level criteria are to be developed which would be usable in future planning, zoning and building inspection processes that promote the maximum compatibility of land uses and generated noise.

2. To protect existing areas whose noise environments are determined to be acceptable, to predict the noise climate to 1990, and to determine the level of future monitoring and review.

3. To use the definition of the community noise environment, in the form of noise contours as provided in the Noise Element to determine local compliance with the State Noise Insulation Standards.

The Noise Element has been prepared according to the "Guidelines for the Preparation and Content of Noise Elements of the General Plan" prepared by the California Department of Health, Office of Noise Control, in coordination with the State Office of Planning and Research.

Government Code Section 65302(g), as amended, requires a noise element of all city and county general plans. This section is reproduced below to more accurately define the intent of the Noise Element.

> A noise element which shall recognize guidelines adopted by the Office of Noise Control pursuant to Section 39850.1 of the Health and Safety Code, and which quantifies the community noise environment in terms of noise exposure contours for both near and long-term levels of growth and traffic activity. Such noise exposure information shall become a guideline for use in development of the land use element to achieve noise compatible land use and also to provide baseline levels and noise source identification for local noise ordinance enforcement.

The state, local, or private agency responsible for the construction, maintenance, or operation of those transportation, industrial or other commercial facilities specified in paragraph 2 of this subdivision shall provide to the local agency producing the general plan, specific data relating to current and projected levels of activity and a detailed methodology for the development of noise contours given this supplied data, or they shall provide noise contours as specified in the foregoing statements.

It shall be the responsibility of the local agency preparing the general plan to specify the manner in which the noise element will be integrated into the city or county's zoning plan and tied to the land use and circulation elements and to the local noise ordinance. The noise element, once adopted, shall also become the guideline for determining compliance with the State's Noise Insulation Standards, as contained in Section 1092 of Title 25 of the California Administrative Code.

## Noise Element Direction

The major focus of this Noise Element is to identify existing and projected noise levels emitted from the various existing and planned land uses and transportation facilities in Siskiyou County. Based on these current and projected noise levels, a county land use policy is identified allowing future land use patterns of a type and intensity compatible with current and projected noise sources. This element basically is intended to provide a sensitivity to the noise impacts of existing and future land uses. It should provide a framework for development policy tuned to the noise emission potential of projects and the environment into which they must fit.

## Description of the Planning Area and its Noise Relationships

The area of study includes the entire unincorporated area of Siskiyou County. Approximately 63% of the County's 6,300 square miles is in public ownership.[1] With an estimated population of 36,500 (1977) or an average density of nearly 6 persons per square mile the indications are that the county should be rural, tranquil and relatively quiet.

However, the attractiveness of Siskiyou County's remoteness, open character and natural resources, which normally are associated with an absence of noise, have in some respects contributed to produce more noise. The county has become a haven for recreation seekers; its forest industry produces jobs which require more people and geographically it lies along the main north-south transportation corridor between the Pacific Northwest and California.

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[1] For a more extensive description of the environmental and economic setting of Siskiyou County see the Siskiyou County Land Use and Circulation Elements.

One of the major industries in Siskiyou County is lumber and wood products involving heavy trucks, and occasional rail transport, and processing capable of producing significant noise. Since much of the county is mountainous but also very attractive for recreational use, numerous camper, motorbike and boating activities also produce noise effects. Recreationl use, however, by its very nature is largely in rural areas where the effects are considerably less than in the urban areas.

The effect of freeway noise along Interstate 5 is more evident through the urban places such as Dunsmuir, Mt. Shasta City, Weed and Yreka. Diesel trucks on steep gradient in the Sacramento River Valley at and in the vicinity of Dunsmuir also produce certain noise. The narrow canyon of the Sacramento Valley creates an amplification effect as indicated from noise contours developed by CALTRANS.[2]

Noise is also produced by trains. The Southern Pacific Railroad traverses steep gradient in the Sacramento River Valley with trains frequently requiring helper engines to Weed and beyond on both tracks to Ashland and Klamath Falls, Oregon. The added engines produce increased noise. Another significant factor in the increased noise effect of train operations is the uniformity of daily operations into the evening and nighttime hours.

Aircraft operations generally are not noise problems in Siskiyou County. However, with considerably increased air traffic projected at the Montague-Yreka Municipal Airport, as well as possible future jet aircraft operations at the Siskiyou County Airports north of Montague and Weed, land use development policy should reflect those future activities.

Progression and Content of Noise Element Text and Appendix

Chapter 2 deals with the definition of the noise problem, including the characteristics of sound, its effects and local noise complaints and the identification of environmental noise sources. The several techniques used in estimating noise contours (i.e., lines of equal noisiness zones) from different noise sources and the resultant mapping information (17 area maps) are provided in the Appendix. The maps also identify those residential units subject to these noise levels. This material forms the basis for the identification of noise sensitive areas and the estimated population affected by excessive noise (current and projected to the 1990-1995 period). The final part of Chapter 2 classifies the various communities into consistent land use and noise environments.

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[2]California Department of Transportation

The sources of environmental noise considered in this analysis shall include, but are not limited to, the following:

1. Highways and freeways.

2. Primary arterials and major local streets.

3. Passenger and freight on-line railroad operations and ground rapid transit systems.

4. Commercial, general aviation, heliport, helistop, and military airport operations, aircraft overflights, jet engine test stands, and all other ground facilities and maintenance functions related to airport operation.

5. Local industrial plants, including, but not limited to, railroad classification yards.

6. Other ground stationary noise sources identified by local agencies as contributing to the community noise environment.

The noise exposure information shall be presented in terms of noise contours expressed in community noise equivalent level (CNEL) or day-night average level (Ldn). CNEL means the average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five decibels to sound levels in the evening from 7 p.m. to 10 p.m. and after addition of 10 decibels to sound levels in the night before 7 a.m. and after 10 p.m. Ldn means the average equivalent A-weighted sound level during a 24-hour day, obtained after addition of 10 decibels to sound levels in the night before 7 a.m. and after 10 p.m.

The contours shall be shown in minimum increments of 5 dB and shall continue down to 60 dB. For areas deemed noise sensitive, including, but not limited to, areas containing schools, hospitals, rest homes, long-term medical or mental care facilities, or any other land use areas deemed noise sensitive by the local jurisdiction, the noise exposure shall be determined by monitoring.

A part of the noise element shall also include the preparation of a community noise exposure inventory, current and projected, which identifies the number of persons exposed to various levels of noise throughout the community. The noise element shall also recommend mitigating measures and possible solutions to existing and foreseeable noise problems.

Chapter 3 presents the recommended noise intensities for various future land uses consistent with the maintenance of interior noise perception not greater than 45 decibels. The recommended policies apply to various development projects and include mitigation to reduce excessive noise impacts. A final section deals with responsibility and enforcement of the recommended noise standards.

# CHAPTER 2

## DEFINING THE NOISE PROBLEM

Noise is a subjective evaluation which can be broadly defined as unwanted and unhealthy sound. Loudness is usually regarded as the prime ingredient; however, there are other characteristics which contribute to the noise and its effects. These include frequency of pitch, duration, masking noises in the environment and the familiarity of certain sounds. Sound is created when an object vibrates and radiates part of its energy as acoustical pressure waves through a medium such as air, water or a solid. Sound has three characteristics - energy, frequency and duration.

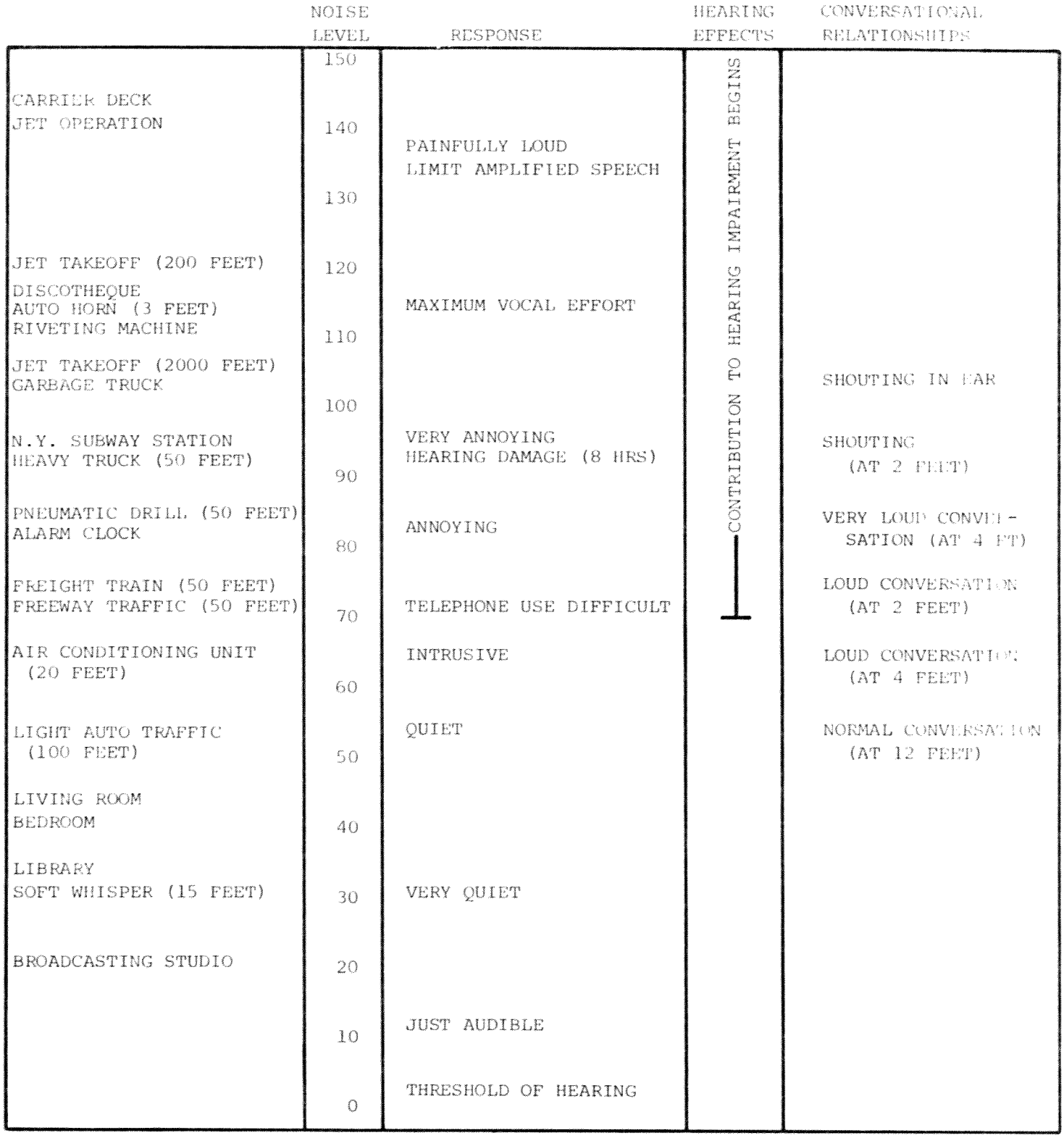
The Effects of Noise on People. Quietness has to be considered as one of Siskiyou County's important resources. The county is known for its wide open spaces, fishing streams, forest and outdoor environment which are enjoyed largely in solitude; that is, the open spaces are synonymous with an absence of noise in order to be appreciated. Many of the new residents and visitors to the county come to escape the effects of urbanism which include distractions such as noise.

Noise has been defined as unwanted and unhelathy sound. There is a certain amount of background noise which is tolerable within each community. This is the result of human activities (e.g., traffic, other people's conversation, air conditioning, other machinery and other activities). These "average background noise becomes intrusive is somewhere in the upper 50 decibel range (see Figure 1, page 6). It is the intrusive noise with which the Noise Element is particularly concerned, although gradual increases in ambient noise resulting from urban development are also of some concern.

In recent years it has been increasingly recognized that excessive noise levels can have adverse effects on people, both in terms of their physical and mental health and in terms of the enjoyment of their environment at work or leisure. Some of these effects are difficult to measure, in part because individuals vary so widely in their sensitivity to noise. Nonetheless, these effects are very real and can be very significant. A discussion of some of the possible effects of excessive noise is found in the Appendix.

Noise Complaints. Relatively few noise complaints have officially been registered at various Siskiyou County offices. Offices normally receiving noise complaints include the Air Pollution Control District (APCD), Sheriff, Environmental Health and Planning Departments. Most complaints center on lumber milling activities, either at established operations around Yreka, Mt. Shasta City and Happy Camp, or portable mills. Portable rock crushing operations (including the transportation of machinery) have also provoked complaints. The following provides a summary list of

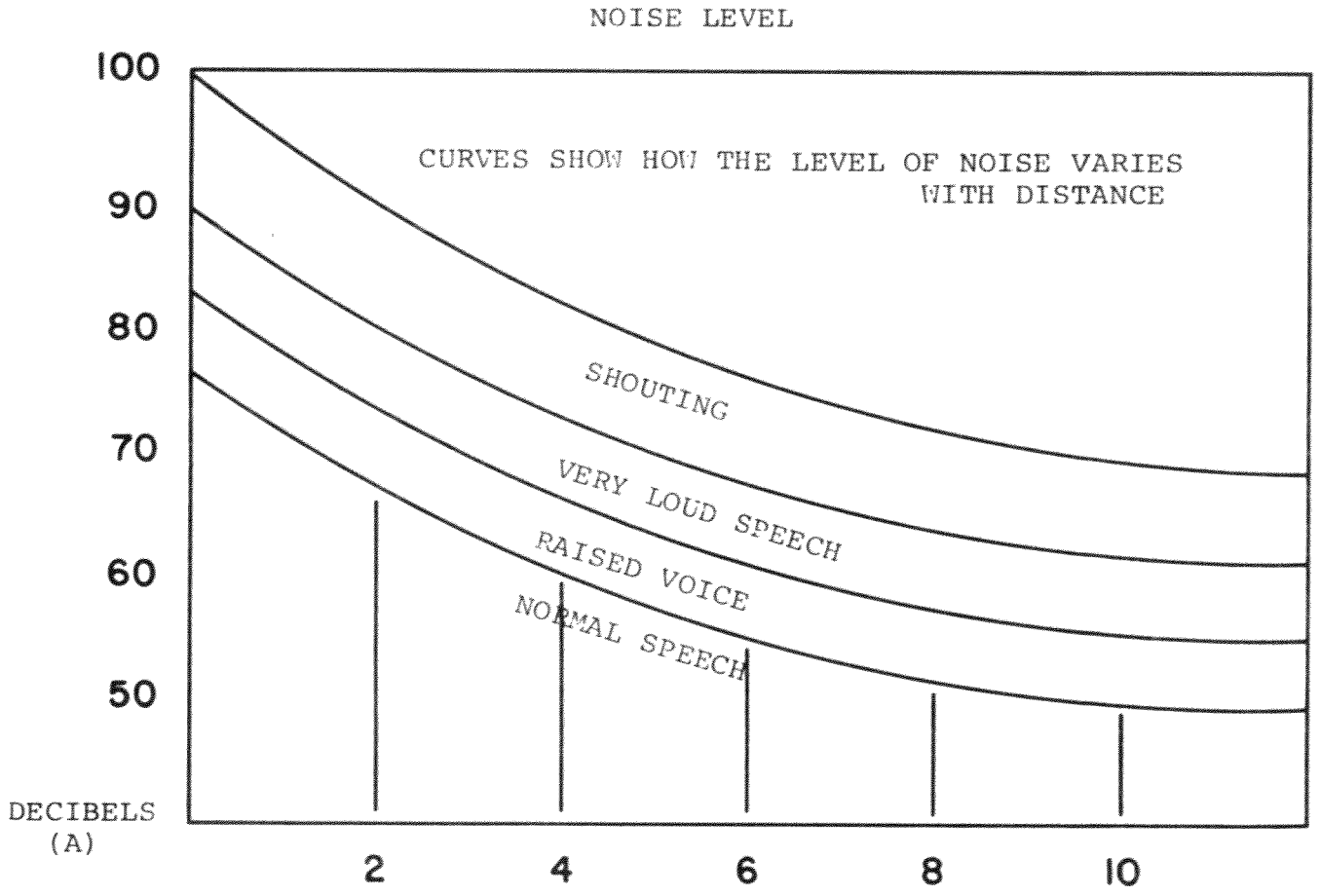
# FIGURE 1: SOUND LEVELS AND HUMAN RESPONSE



SOUND LEVELS IN DECIBELS (dB) ARE CALCULATED ON A LOGARITHMIC BASIS. AN INCREASE OF 10 DECIBELS REPRESENTS A 10-FOLD INCREASE IN ACOUSTIC ENERGY WHILE AN INCREASE OF 20 DECIBELS CORRESPONDS TO A 100-FOLD INCREASE IN ACOUSTIC ENERGY.

HOWEVER, THE HUMAN EAR ALSO WORKS LOGARITHMICALLY. HENCE, OUR PERCEPTION OF THE NOISE INCREASE (LOUDNESS) WORKS IN SUCH A WAY THAT EACH 10 dB INCREASE IN SOUND LEVEL IS PERCEIVED AS APPROXIMATELY A DOUBLING OF LOUDNESS. THE NOISE PRODUCED BY A HEAVY TRUCK (90 DECIBELS), FOR EXAMPLE, SEEMS TWICE AS LOUD AS AN ALARM CLOCK (80 DECIBELS), BUT FOUR TIMES AS LOUD AS FREEWAY TRAFFIC (70 DECIBELS).

THE WEIGHTED A SCALE APPROXIMATES THE FREQUENCY RESPONSE OF THE HUMAN EAR BY PLACING MOST EMPHASIS ON THE FREQUENCY RANGE OF 1,000 TO 6,000 HERTZ. SOUND LEVELS MEASURED USING A-WEIGHTING ARE OFTEN EXPRESSED AS dBA. THE CHART AT RIGHT SHOWS HOW SOUND INTERFERES WITH SPEECH.




SOURCE: Draft Noise Element, Santa Cruz County, CA. (August, 1977), page 9.

noise complaints from the various sources with an indication of the location noise source and reception:

| Complaint Area | Reported Noise Source |
|---|---|
| South Yreka - Highway 3 | Pine Mountain Lumber Company |
| Trailer Park along Oberlin Road - Yreka | Lumber, wood products operation |
| South Mt. Shasta City (motel) | Kimberly Clark Lumber Company |
| Parks Creek - near Edgewood | Rock Crusher (O'Hare) |
| Callahan | Rock Crusher<br>Portable Lumber Mills |

Noise readings have been taken at several of the complaint locations and are presented in the evaluation section on Stationary Noise Sources (later in this Chapter, pages 35,36). Minor Complaints have been received by the Sheriff on excessive barking by dogs - a rather typical problem encountered in areas of growing population in a semi-rural and suburban environment.

Sources of Environmental Noise. Five sources of noise production are analyzed in this section. These are State Highways (CALTRANS), County Roads and Streets, Railroads, Airports and Stationary Sources. Each section includes a discussion of the technique used to determine adverse noise effects and an analysis of each community or area affected by the source noise emissions including the number of housing units and population exposed within several levels of adverse noise. Determination of the total population affected by adverse noise from the various sources meets state guidelines calling for a community noise exposure inventory. The summation of existing and projected noise exposure is provided on pages 40 through 46.

## STATE HIGHWAYS

CALTRANS (California Department of Transportation) has provided maps and other data indicating noise contours for all State routes in Siskiyou County for incorporation into a noise element. This information was collected and produced in a report format in 1974.[3] Noise level information was provided on the $L_{10}$ scale which represents A-weighted sound exceeded 10% of the sample time. In order to provide uniformity in the data presented for the Housing Element, it was necessary to adjust the $L_{10}$ measurements to approximate the Day-Night Average Level (Ldn). This section provides a summation of the mapping information and implications to the existing population in terms of exposure and the relationship of projected highway noise, future development and population exposure. The maps show both existing (1974) and projected noise contours and are located in the Appendix. With the exception of Maps 9, 13 and 15, each map indicates State Highway noise contours and the housing units exposed to the various noise levels. It also provides noise impact information in tabular form on State routes with lower volumes and less noise impact. An explanation of the CALTRANS contour development techniques with modification to Ldn values can be found in the Appendix.

Summation of State Traffic Noise Effects. Noise contours are provided on Maps in the Appendix for Interstate 5 in the vicinity of Dunsmuir (Maps 7 and 7), Mt. Shasta City (Maps 4 and 5), Yreka (Map 3), Grenada (Map 10), Hornbrook (Map 11), and the Weed Airport Area (Map 14). Noise contours are also provided for urban areas of McCloud (Route 89, Map 8) and Happy Camp (Route 96, Map 1). Highway 97 noise effects are described at Carrick's Addition north of Weed (Map 2), Macdoel (Map 12) and the Butte Valley Airport (Map 16). Route 3 noise contours are also described at Yreka (Map 3) and Montague (Map 17) with tabular information at other locations on Route 3 and other routes at the end of this part.

The following approach is to describe each community where population is exposed or will be exposed to estimated noise levels of 60 db(A) or greater. A small table is included showing the housing units and estimated population within each contour.

1. Happy Camp. Only 60 Ldn estimates were developed for 1974 and 60 and 65 Ldn projections made for State Highway 96 through Happy Camp from CALTRANS recorder generated $L_{10}$ noise contours. However, an estimate is provided for current 50 Ldn noise contour distance and exposed population on the basis of the relative differences in 1995 60 and 65 Ldn distances. This yields similar distance

[3]Correspondence, maps, aerial photographs and sound records from E.W. Knaebel, CALTRANS District Director to Mr. Gene H. Kincaid, then Planning Director of County of Siskiyou, September 19, 1974.

results in the 4 1/2 to 6 db(A) reduction experienced in the doubling of distance because of the spreading of noise energy with distance. The estimated contour distances from the edge of the traveled road, the units and population exposed to the two levels of highway noise are as follows:

| | 1974 | | | 1995 | | |
|---|---|---|---|---|---|---|
| | DISTANCE[a] | UNITS[b] | POPULATION | DISTANCE | UNITS | POPULATION |
| 65 db(A) (Ldn) | 81' | 24 | 65 | 123' | 46 | 125 |
| 60 db(A) (Ldn) | 143-148' | 60 | 165 | 218-225' | 106 | 290 |

[a]Measured from the edge of traveled way
[b]Based on 1968 Land Use information

The current and projected contours are extended to the Happy Camp Elementary School playground (access via Second Avenue). The projected 60 Ldn levels do not appear to reach the school classrooms. While Noise Element requirements include noise exposure determination by monitoring for noise sensitive areas, such as schools, it is assumed that the intent is to precisely document exterior noise effects to the classroom. This facility is discussed further under Noise Sensitive Places, pages 36-39.

2. Carrick's Addition (Weed area). Carrick's Addition is a small subdivision and lot development consisting of approximately 100 lots located one-half mile north of the City of Weed along U.S. Highway 97. CALTRANS provided $L_{10}$ contours estimated for 1977 and 1995 noise values. These have been amended according to the 4.5 db(A) drop off rate per double distance to produce Ldn values. The following distances and population exposure have been determined for Carrick's Addition:

| | 1977 | | | 1995 | | |
|---|---|---|---|---|---|---|
| | DISTANCE | UNITS[a] | POPULATION | DISTANCE | UNITS[a] | POPULATION |
| 70 db(A) (Ldn) | 110-130' | 4 | 4 | 150-250' | 22 | 65 |
| 65 db(A) (Ldn) | 150-250' | 22 | 65 | 260-380' | 39 | 115 |
| 60 db(A) (Ldn) | 270-470' | 39 | 115 | 430-720' | 57 | 170 |

[a]The variations in distance originate from $L_{10}$ noise contours generated from recording information. Because of this the readings and subsequent contours are influenced by actual traffic noises due to topography (including truck shifting,) vegetation and structural barriers.

3. South Yreka. The contours for Interstate 5 and State Route 3 south of the Yreka City boundary are based on conversions of CALTRANS field data. Projections to 1995 are based on

a general db(A) increase or the addition of 58 feet to the current (1974) contour distances. The following distances and exposed population based on current land use investigation are:

| INTERSTATE 5 | 1974-78 | | | 1995 | | |
|---|---|---|---|---|---|---|
| db(A) (Ldn) | DISTANCE | UNITS[a] | POPU-LATION | DISTANCE | UNITS[a] | POPU-LATION |
| 70 | 118' | 0 | 0 | 176' | 12 | 30 |
| 65 | 180' | 12 | 30 | 238' | 29 | 70 |
| 60 | 400' | 61 | 135 | 458' | 73 | 175 |
| STATE ROUTE 3 | | | | | | |
| 65 | 100' | 0 | 0 | 158' | 0 | 0 |
| 60 | 258' | 0 | 0 | 316' | 0 | 0 |

[a]From 1978 Land Use Field Survey

Field recordings (January, 1978) indicated considerable sound transmission emanating from I-5 traffic.[4] This may be due to the general lack of noise barriers (open field) near the Yreka City limits.

4. Mt. Shasta Urban Fringe. Noise contours for Interstate 5 in the vicinity of Mt. Shasta City are shown on Maps 4 and 5. Contours for the entire eight mile segment reflect those prepared by CALTRANS for the Lake Street Overcrossing. The estimated distances and population exposure for Ldn noise value conversions are as follows:

| | 1974 | | | 1995 | | |
|---|---|---|---|---|---|---|
| db(A) (Ldn) | DISTANCE | UNITS[a] | POPU-LATION | DISTANCE | UNITS[a] | POPU-LATION |
| 70 | 123' | | | 148' | | |
| 65 | 173' | | | 250' | 1 | 3 |
| 60 | 273' | 1 | 3 | 473' | 6 | 15 |

[a]From 1975 aerial photography supplied by U.S. Forest Service, Shasta-Trinity National Forest, Redding.

The noise effect from the freeway is rather insignificant in terms of human perception; however, 50% of an 8-acre park owned and maintained by the City of Mt. Shasta City is

[4]Freeway noise registered 58 db(A) (Ldn) at a distance 800-900 feet west (near State Route 3.) Diesel trucks registered 66-68 db(A). The ambient noise level for the Saturday afternoon was 55-60 db(A).

potentially affected by projected 1995 60 db(A) (Ldn) noise. Only the southwest corner (less than one acre) is currently within the 1974 60 db(A) contour.

5. Dunsmuir Urban Fringe. Noise contours for I-5 in the vicinity of Dunsmuir are indicated on two maps in the Appendix (6,7.)

The estimated contours for the area north and west of the City of Dunsmuir are based on the projection of $L_{10}$ noise contours used in the Mt. Shasta City Map. For the area south of Dunsmuir, contours applied were prepared by CALTRANS for the Sacramento River Bridge within the City of Dunsmuir. A small part of the unincorporated area lies west of the city which is currently not developed to housing; however, an inset of this area is included on Map 7, south Dunsmuir Urban Fringe in the Appendix for future project noise evaluation. The following noise contour distances and the estimated exposed population are:

| | 1974 | | | 1955 | | |
|---|---|---|---|---|---|---|
| db(A) (Ldn) | DISTANCE | UNITS[a] | POPU-LATION | DISTANCE | UNITS[a] | POPU-LATION |
| 75 | 118' | 4 | 10 | 153' | 7 | 15 |
| 70 | 193' | 10 | 20 | 268' | 14 | 35 |
| 65 | 373' | 20 | 45 | 468' | 26 | 60 |
| 60 | 868' | 54 | 120 | 968' | 55 | 122 |

[a]Based on 1975 aerial photography provided by the U.S. Forest Service, Mt. Shasta National Forest (Redding).
The extensive distances indicated for 60 db(A) estimations are influenced by several factors: The presence of a high truck traffic component, including diesels, and a natural amplification of noise within the topographic confines of the upper Sacramento River Canyon and a rougher road surfacing on the Sacramento River Bridge.

6. McCloud. Noise estimation by CALTRANS on State Route 89 indicates that noise is significant only to McCloud (at Broadway) from the west. The following distances and population exposure is indicated for McCloud:

| | 1974 | | | 1995 | | |
|---|---|---|---|---|---|---|
| db(A) (Ldn) | DISTANCE | UNITS[a] | POPU-LATION | DISTANCE | UNITS[a] | POPU-LATION |
| 65 | 88-113 | 2 | 5 | 138-158' | 3 | 8 |
| 60 | 158-183 | 5 | 13 | 228-248' | 7 | 18 |

[a]Based on 1968 Land Use Data

The variation in distances within each noise level is due to the gradient and necessary acceleration, including trucks.

Since the original $L_{10}$ noise contours were generated from noise measurements, the variations reflect actual site conditions.

7. Other Communities exposed to State Highway Noise.

| STATE ROUTE 3 | 1974 DISTANCE | 1974 UNITS[a] | 1974 POPULATION | 1995 DISTANCE | 1995 UNITS[a] | 1995 POPULATION |
|---|---|---|---|---|---|---|
| At Montague to 2.5 mi west - see Map 17 | | | | | | |
| 65 db(A) (Ldn) | 50' | 0 | 0 | 130' | 0 | 0 |
| 60 db(A) (Ldn) | 119' | 5 | 15 | 209' | 15 | 40 |
| At Fort Jones City Limits | | | | | | |
| 60 db(A) (Ldn) | 130' | 1 | 3 | 188' | 1 | 3 |
| INTERSTATE 5 | | | | | | |
| Weed Airport - See Map 14; Grenada - See Map 10 | | | | | | |
| 70 db(A) (Ldn) | 50' | 0 | 0 | 118' | 0 | 0 |
| 65 db(A) (Ldn) | 158' | 0 | 0 | 216' | 0 | 0 |
| 60 db(A) (Ldn) | 268' | 0 | 0 | 326' | 0 | 0 |
| Hornbrook/Henley - See Map 11 | | | | | | |
| 70 db(A) (Ldn) | 118' | 1 | 3 | 176' | 2 | 5 |
| 65 db(A) (Ldn) | 180' | 2 | 5 | 238' | 4 | 10 |
| 60 db(A) (Ldn) | 400' | 11 | 28 | 458' | 14 | 35 |

| | 1974 DISTANCE | 1974 UNITS[a] | 1974 POPULATION | 1995 DISTANCE | 1995 UNITS[a] | 1995 POPULATION |
|---|---|---|---|---|---|---|
| STATE/FEDERAL ROUTE 97 | | | | | | |
| Macdoel - See Map 12[b] | | | | | | |
| 70 db(A) (Ldn) | 118' | 4 | 10 | 186' | 0 | 22 |
| 65 db(A) (Ldn) | 180' | 8 | 20 | 248' | 12 | 30 |
| 60 db(A) (Ldn) | 400' | 17 | 40 | 468' | 18 | 43 |
| Butte Valley Airport - See Map 16 | | | | | | |
| 65 db(A) (Ldn) | 50' | 0 | 0 | 130' | 0 | 0 |
| 60 db(A) (Ldn) | 158' | 0 | 0 | 238' | 0 | 0 |
| STATE ROUTE 139 | | | | | | |
| Oregon State line to Modoc County Line - Tulelake | | | | | | |
| 65 db(A) (Ldn) | 108' | 6 | 13 | 188' | 11 | 27 |
| 60 db(A) (Ldn) | 168' | 10 | 25 | 248' | 11 | 27 |

[a]Based on 1968 Land Use Data
[b]The population in Macdoel affected by State Highway Noise is also affected by railroad noise.

The following table (Table 1) summarizes the number of housing units and population exposed to various noise levels on the basis of existing land use information. The total 662 population subject to 60 db(A) (Ldn) or greater noise represents 3.3% of the entire unincorporated County estimated population in 1975.

TABLE 1: SUMMARY HOUSING UNITS AND ESTIMATED POPULATION EXPOSED TO SIGNIFICANT NOISE LEVELS ALONG STATE AND FEDERAL HIGHWAYS, UNINCORPORATED SISKIYOU COUNTY, CURRENT (1968-1974) AND PROJECTED (1995)

| | 1974 | | 1995 | |
|---|---|---|---|---|
| Noise Level | Housing Units | Population | Housing Units | Population |
| 75 db(A) | 4 | 10 | 7 | 15 |
| 70 db(A) | 29 | 73 | 48 | 157 |
| 65 db(A) | 96 | 248 | 171 | 448 |
| 60 db(A) | 264 | 662 | 363 | 938 |

Each following noise level is additive; that is, it includes the total of the previous level.

## COUNTY ROADS AND STREETS

This section deals with the estimated noise effect created by current and projected (1990) traffic on roads and streets maintained by the County of Siskiyou. Noise contours have been prepared using a nomograph technique designating 60, 65 and 70 decibels (db(A) converted to average day-night levels (Ldn)). Available land use data (1968) have been augmented with aerial photographic interpretation and field enumeration of housing units to determine the extent of housing and estimated population within current and future noise levels. The estimation involves selected urban or urbanizing areas of the unincorporated county. The areas are Happy Camp, McCloud, Grenada, Hornbrook and the urban fringe adjacent to the cities of Mt. Shasta City and Yreka (south only). Noise contours for county routes and the housing units within them are identified in maps and tables in the Appendix.

A description of the contour development technique and the existing and projected noise effect in each community studied can be found in the Appendix. This part summarizes the housing units and population totals by estimated and projected noise levels. Detailed tables (A-7,8) in the Appendix describe the noise contour distances and the housing by type along each major route by noise level. The Appendix tables and maps may be used to evaluate the traffic noise effect within the vicinity of proposed housing projects and programs.

Community Noise Effect. The following provides a summary of the county road and street traffic noise effect in the several communities studied. Reference may be made to the appropriate map and tables in the Appendix and the summary section commencing on page 40. The estimated population within current and projected noise contours was determined from State Department of Finance estimated housing vacancy rates and population per household for Siskiyou County and its cities (January, 1977).

1. Happy Camp (Map A-1). Approximately 26% of the Happy Camp population is subject to 60 db(A) or greater noise generated from traffic on county roads. Thirty-three of the total 76 housing units are mobilehomes which provide generally less sound insulation that permanent structures (see footnote, page 21). Units have been built on small lots resulting in a relatively high housing density. This has been imposed by the physical restrictions of surrounding mountains, streams and U.S. Forest properties. The competition for available, buildable land for a variety of activities, including housing, creates a "noisy" climate. The most obvious noise

generator is traffic on both county streets and State Highway 96. It is significant that two-thirds of the population affected by 60 db(A) noise is also subject to the higher 65 db(A) level.

Future noise levels based on a projected local growth of 15%[5] and a 20% increase in non-local (primarily recreational) traffic by 1990 on arterials and collector streets shows an additional 22 existing housing units subject to higher noise effects (65 db(A)). Essentially 29% more homes will be affected by a population increase of only 15% and the non-local traffic component.

Happy Camp High School, a facility determined to be noise sensitive, is affected by the higher noise levels. However, the noise calculations based on peak hour traffic may not directly apply to facilities that are not operating during peak hour traffic movements. Additional information on noise sensitive places is provided on pages 36-39.

2. South Yreka (Map A-3). Only 18 housing units, primarily along Fairlane Road, are subject to higher noise effects from county streets. Half of these are mobilehomes. The prospects are that no additional units will be affected by 1990 unless new units are added within the designated noise effect (60 db(A)) areas.

   The greatest noise influence in this area is the presence of Interstate 5 as it overshadows the effect of county roads and streets. Only one housing unit of the 18 units affected by county road noise is not influenced also by I-5 noise. The extent of housing units and population within two or more adverse noise generators is discussed further on page 42.

   Projections for the South Yreka area call for approximately 33% growth. This is based on overall growth forecasts for the urban Yreka area and the extent of available lots in the Walters Lane areas.

3. Mt. Shasta City Area (Maps A-4, 5). County road traffic adversely affects approximately 300 of the estimated 800 persons (or 37.5% within the urban fringe adjacent to Mt. Shasta City. About one-third of this population is also affected by other adverse noise effects - primarily railroad activities.

   Projection of noise contours to 1990 indicates another 39 units within higher noise areas or approximately 39% of the projected urban fringe population. Growth projections show

[5]The existing and projected population for urban and urbanizing areas in Siskiyou County is provided in Appendix Table A.

an increase of 30% local population and traffic generation and 20% non-local (recreation oriented) traffic. The total 50% increase in county road traffic becomes significant when consideration is given to the extent of available land and parcels along the lengthy county road system west of Mt. Shasta City (see map). Because of the relatively unrestricted physical constraints to land development in this area, the potential exists for many more housing units to be developed within existing and projected adverse noise levels estimated from county road traffic. The units developed will also add to the noise "climate" or ambient noise levels in the community.

4. McCloud (Map A-8). Currently an estimated 25% of the McCloud population (380 persons) is subject to high road and street traffic noise. By 1990, however, it is expected the proportion will be reduced to approximately 23%. A relatively low growth rate (12%) and the buffering effect created by the existing row houses in preventing noise passage in McCloud are the primary factors in stabilization of noise effect (see footnote, page 22).

   As in Happy Camp, another urban unincorporated community, the extent of higher decibel contours (65 db(A)) is significant. About 55% of the population within the 60 db(A) contour is within the 65 db(A) noise level. One factor which may reduce the noise effect inside houses along Broadway and other streets in the older portion of McCloud is the insulation provided in the older homes against winter effects.

   Noise sensitive places include the High School and a small park which are both only slightly affected by street noise. Further attention to noise sensitive places is provided on pages 36-39.

5. Grenada (Map A-10). Most of the residents in Grenada (88% or approximately 210 persons) are subject to high noise levels from traffic on Highway A-12 and Montague Road. Most of this impact is received from a high (20%) truck component using this route as a connection between Interstate 5 and Highway 97. Much of the truck traffic includes logging trucks enroute to lumber mills in Yreka. However, two-thirds or greater of the affected population is also influenced by railroad noise.

   Many of the units within adverse noise areas are small, older units and mobilehomes which may not adequately protect occupants from high noise generation. Projections of future noise show a possible 50% increase by 1990 in all traffic along county roads through Grenada. Grenada's location at the "crossroads" will be important in terms of future trucking and recreational traffic. Therefore, the location of future housing is also important with respect to projected noise levels.

6. Hornbrook/Henley (Map A-11). Approximately 25% of this community's population is affected by county road traffic noise. Most of this includes units along Henley-Hornbrook Road which provides linkage between Interstate 5 and Copco Road. Copco Road provides access to the Upper Klamath River, Irongate Reservoir and Copco Lake and therefore carries significant recreational traffic. A substantial part of the recreational traffic should be reduced on Hornbrook-Henley Road with the completion of a 0.4 mile segment in the Hornbrook Ager Road (see Map).

Tabular Information. The following tables summarize the housing by type and estimated population within the major unincorporated areas studied by estimated noise level.

TABLE 2: SUMMARY HOUSING UNITS AND POPULATION WITHIN ESTIMATED ADVERSE NOISE LEVELS, SISKIYOU COUNTY COMMUNITIES, 1977 (IN AVERAGE DAY-NIGHT LEVELS, Ldn) - COUNTY ROADS

| AREA | 70 db(A) UNITS[a] | 70 db(A) POP. | 65 db(A) UNITS | 65 db(A) POP. | 60 db(A) UNITS | 60 db(A) POP. |
|---|---|---|---|---|---|---|
| Happy Camp | 0-9 | 22 | 25-25 | 132 | 43-33 | 210 |
| South Yreka | | | 2-1 | 8 | 9-9 | 43 |
| Mt. Shasta City | 10-0 | 25 | 43-0 | 106 | 125-0 | 316 |
| McCloud | 10-0 | 27 | 79-1 | 213 | 143-2 | 386 |
| Grenada | 9-0 | 22 | 17-3 | 51 | 65-16 | 210 |
| Hornbrook | | | | | 24-0 | 59 |
| TOTALS | 29-9 | 96 | 166-30 | 510 | 404-60 | 1,224 |

TABLE 3: SUMMARY HOUSING UNITS AND POPULATION WITHIN PROJECTED NOISE LEVELS, SISKIYOU COUNTY COMMUNITIES, 1990 - COUNTY ROADS

| AREA | 70 db(A) UNITS | 70 db(A) POP. | 65 db(A) UNITS | 65 db(A) POP. | 60 db(A) UNITS | 60 db(A) POP. |
|---|---|---|---|---|---|---|
| Happy Camp | 1-16 | 43 | 31-28 | 158 | 54-44 | 262 |
| South Yreka | | | 2-1 | 8 | 9-9 | 43 |
| Mt. Shasta City | 11-0 | 27 | 82-0 | 212 | 164-0 | 438 |
| McCloud | 10-0 | 27 | 79-1 | 213 | 143-2 | 386 |
| Grenada | 9-0 | 22 | 32-3 | 89 | 72-16 | 227 |
| Hornbrook | | | 2-0 | 5 | 37-0 | 95 |
| TOTALS | 31-16 | 119 | 228-33 | 685 | 474-71 | 1,451 |

[a]Shown as permanent structures and mobilehome units (e.g., 23-5 indicates 23 permanent units and 5 mobilehomes.)

The total estimated 1,223 persons currently affected by adverse noise created along county roads and streets represents 6.1% of

the total unincorporated county population. Most of these units were constructed when lower traffic volumes produced less noise and also when noise was not considered as seriously as it is today. However, many units represent mobilehomes, particularly in Happy Camp, which were sited more recently than the older units in McCloud, Grenada and Happy Camp. Mt. Shasta City area presents a more recent situation with many units constructed since 1950 and the potential for considerably more units within future high noise effect corridors (Old Stage Road, W.A. Barr Road, Lassen Lane, etc.) Hornbrook and South Yreka do not present significant problems and both areas hold potential for the development of new routes which may alleviate the present traffic noise effect on local streets and roads.

## RAILROADS

Three Railroad companies operate in Siskiyou County. The largest is the Southern Pacific Railroad which extends from Shasta County on the south near Dunsmuir to the Oregon border on the north. This railroad separates at Weed, with the major part of operations (up to 20 daily trips) along the east branch to Klamath Falls, Oregon. Lesser operations extend along the western branch line through Montague, north to Ashland, Oregon. The McCloud River Railroad originates from McCloud and provides service to Mt. Shasta City and to two separate lines eastward. The Yreka Western Railroad provides daily service between Montague and Yreka. All services are freight handling except for the Southern Pacific Amtrak train from Portland, using the Klamath Falls route with daily stops in Dunsmuir.

A railroad noise estimating technique is presented in the Appendix. The following section describes specific rail activities and their effects upon the several communities and urban fringe areas. Maps 4 through 12 in the Appendix indicate railroad noise contours and the housing units affected by various noise levels.

### Current Railroad Operation

The Southern Pacific Railroad averages approximately 24 on-line operations per day in Siskiyou County from Shasta County to Weed - or one per hour. The daily distribution includes 15 daytime and 9 night time operations on the Weed to Klamath Falls, Oregon Main Branch, the 20 total operations have a higher equivalent number of operation (128). This tends to include a high proportion of housing within the 60 and 65 db(A) contours in Macdoel and Mt. Hebron.

The branch line from Weed to Ashland, Oregon includes two levels of activity. A total of four on-line operations (two at night) continue to Montague through Gazelle and Grenada. Only two daily operations (one at night) continues from Montague northward through Hornbrook.

The McCloud River Railroad provides three round-trip operations daily. The McCloud to Mt. Shasta City route is a night time operation (20 equivalent operations). The "Lookout Mountain" route operates over Burlington Northern tracks from Hambone to Lookout Junction in Modoc County. It leaves McCloud in the early evening and returns in the early morning (one daytime and one nighttime operation). The McCloud to Burney operation is totally within normal daytime hours. Since all McCloud River Railroad operation originate and terminate in McCloud on a round-trip basis, the total noise effect occurs in the McCloud community (33 equivalent operations).

Table A - 11 in the Appendix, indicates the estimated distances for several noise impact contours on the various railroad segments represented. The Yreka Western Railroad is not included since it operates only one daytime round trip operation, producing 60db(A) (Ldn) noise levels at an undetermined distance less than 100 feet from the railroad. Since no dwelling units within the unincorporated County are within 100 feet of the Yreka Western Railroad it has no significant noise impact on residences.

It is extremely difficult to forecast future railroad noise impacts since forecasts from private operations are difficult to determine. Operations are not expanding; however, with a possible greater imphasis on fixed-rail operation in terms of energy efficiency, this picture could change. This possibilitiy would have deleterious effects in producing greater noise unless technology and governmental controls combined to produce quieter operation. It is recommended that the adopted Noise Element be re-evaluated with any shift in bulk transportation modes arising from new energy policies, programs and changing technology.

The following section, describing the population levels affected by railroad noise, is intended to be used with maps depicting railroad and other noise contours in the Appendix.

## Population Affected by Railroad Noise

This section describes each community and urban fringe area affected at several noise levels on the basis of noise contours generated from rail activities and the standard nomogram procedure. The approach is to define housing units within noise contours on the basis of available land use information.[6] The units are translated into population by applying latest estimated housing vacancy rates and population per household.

1. Mt. Shasta Urban Fringe Area (Maps 4 and 5). This area is influenced by noise generated from two railroads - the Southern Pacific Railroad proceeding in a general southeast to northwest direction and the McCloud River Railroad along the north boundary of Mt. Shasta City. As the summary table (Table 4) indicates, approximately 280 persons, or 105 households (of a total 117 housing units) are subject to railroad noise at an intensity of 60 db(A) (Ldn) or greater.

[6]This study is limited to 1968 land use updated for urban fringes and communities with 1973 and 1975 aerial photography provided by the U.S. Forest Service and the California Department of Water Resources. Housing units in the urban fringe of Dunsmuir and in Gazelle, Grenada, Hornbrook and Macdoel/Mt. Hebron were updated by 1978 field investigation.

Helper engines required to assist freight operations up the grade from Dunsmuir and full day and night activities produce an understandable railroad noise effect. This railroad noise is combined with freeway traffic, including diesel trucks, to produce a continuous noise impact on a 24-hour basis.

2. North Dunsmuir Urban Fringe Area (Map 6). The population affected by railroad noise is variable because of the summer seminar/retreats at the St. Germaine Foundation. The summer population is estimated at ± 150 while the permanent population is estimated at 20. The Cantara Loops (see Map) require slow train movements which extend the amount of exposure required in the hourly train operations from Dunsmuir.

3. South Dunsmuir Urban Fringe Area (Map 7). Railroad noise at the equivalent daily operational level (average throughout the 24-hour day) of 60 db(A) (Ldn) or greater exposes virtually the entire population of 362 residents between the City of Dunsmuir and Shasta County. A mobilehome park containing 16 mobilehome units is included. Mobilehomes may be less resistant to exterior sound effect than conventional construction.[7]

   It is important to understand the additional noise effect created by freeway traffic on Interstate 5, including diesel trucks. This is particularly evident for the residents of approximately 44 housing units located between I-5 and the railroad. The population represented (approximately 110 persons) is subject to both noise sources at 60 db(A) or greater.

4. McCloud (Map 8). Approximately 124 housing units or 325 persons in the McCloud community are subject to 60 db(A) or greater railroad generated noise levels. This represents over 20% of the entire population in McCloud.

   The source of railroad noise is the McCloud River Railroad operations which originate and terminate three daily round trips from the railroad depot in the center of the community. Three of the six line operations occur during nighttime hours. Because of the higher density or urban

[7] A preliminary study by the State Office of Noise Control (Berkeley) shows that mobilehomes facing highway noise sources, with windows closed, reduce noise effect by approximately 19 db(A) compared to a 25-28 db(A) reduction by conventional residential construction.

housing in McCloud (approximately 4 units per gross acre) and the barrier effect created in suppressing noise inputs to additional housing away from the noise source, the noise contours have been adjusted.[8]

5. Gazelle (Map 9). Gazelle is located on Old Highway 99, approximately 10 miles northwest of Weed. Approximately 43 persons, or one-half of the community's total population, is exposed to 60 db(A) (Ldn) or greater on a daily average basis. Four operations use (two at night) the Southern Pacific Railroad each day.

6. Grenada (Map 10). Approximately 70% of the residents of Grenada are subject to 60 db(A) or greater noise values from the four daily Southern Pacific Railroad operations (60 persons of an estimated 195 total). In addition to this, high vehicle traffic volumes on the 99-97 cutoff (Route A-12) add to the noise environment (see County road noise section) in Grenada.

7. Hornbrook (Map 11). The community of Hornbrook is located approximately 17 miles north of Yreka, via Interstate 5. With only two daily on-line operations on the Southern Pacific Railroad branch line, approximately 50 persons are exposed to significant railroad noise (60 db(A) or greater.) This represents 27% of the community's total estimated current population. Many of these units are older and may not have insulation that would reduce noise effects. Hornbrook is also subject to road noise - particularly recreational traffic to Irongate Reservoir in the summer.

8. Macdoel/Mt. Hebron (Map 12). Macdoel and Mt. Hebron are located three miles apart on Old State Highway (County Arterial 8Q01) and the Southern Pacific Railroad Main Branch Line from Weed to Klamath Falls, Oregon. Over 80% of the population residing in the two communities are exposed to noise at an intensity of 60 db(A) or greater.

[8]With 60-80% of the space occupied by buildings (housing), the noise buffering or reduction is estimated at 5 db(A) (Fundamentals and Abatement of Highway Traffic Noise, U.S. Department of Transportation, June, 1973, pp. 1-18.)

Summary

The previous material indicates that the total permanent population exposed to railroad noise (60 db(A) or greater) is approximately 1,482 or 7.4% of the total 1977 estimated unincorporated County population. Nearly one-half of this total, however, or 649 persons, is exposed to a daily average noise of 65 db(A) or greater. (See Table 4 on following page.)

Some communities are obviously affected by railroad noise considerably more than others. The South Dunsmuir urban fringe area population, for example, is almost entirely subjected to high railroad noise exposure. This is an obvious result from the competition for available, buildable land area when the supply is severely limited. Regional needs for transportation compete with local land use demands. Other communities with higher exposure incidence to railroad noise are Macdoel/Mt. Hebron (over 80%), Gazelle (50%), Mt. Shasta Urban Fringe (35%), Hornbrook (23%) and McCloud (20%+). Housing adjacent to both the north and south boundaries of the City of Mt. Shasta are particularly subject to the 65 db(A) (Ldn) noise level.

TABLE 4: SUMMARY ESTIMATED HOUSING UNITS AND POPULATION EXPOSED TO RAILROAD NOISE BY 60 to 75 db(A)(LDN) NOISE CONTOURS, 1973 - 1975

| MAP | MOUNT SHASTA | NORTH MOUNT SHASTA | NORTH DUNSMUIR | SOUTH DUNSMUIR | MCCLOUD | GAZELLE | GRENADA | HORNBROOK | MACDOEL/ MT. HEBRON | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| 75 db(A) | | | | | | | | | | |
| Housing Units | | | | | | | | | 10 | 10 |
| Est. Population | | | | | | | | | | |
| 70 db(A)+ | | | | | | | | | | |
| Housing Units | 29 | 5 | 4 | 19 | 9 | 5 | 5 | | 16 | 92 |
| Est. Population | 67 | 11 | 8 | 49 | 22 | 10 | 11 | | 38 | 186 |
| 65 db(A)+ | | | | | | | | | | |
| Housing Units | 64 | 11 | 14 | 48 | 50 | 9 | 38 | 3 | 36 | 273 |
| Est. Population | 152 | 27 | 20 | 116 | 128 | 22 | 92 | 6 | 86 | 649 |
| 60 db(A)+ | | | | | | | | | | |
| Housing Units | 96 | 21 | 26 | 149 | 124 | 18 | 63 | 20 | 98 | 615 |
| Est. Population | 230 | 50 | 30 | 362 | 325 | 43 | 154 | 50 | 238 | 1,482 |

Each contour level below 75 db(A) is cumulative; that is, the 65 db(A) contour includes housing units within the 70 and 75 db(A) contours. The 60 db(A) represents the total units and population subject to railroad noise exposure.

## AIRPORTS

The definition of airport noise operations is expressed in noise contours in decibels on the CNEL (Community Noise Exposure Level) scale. As indicated in the Appendix on page 2 the difference between the CNEL and Ldn scales is the additional emphasis in the former for evening (7-10 p.m.) activities. This section consists of descriptions of the existing and projected operations at each airport and a brief description of the existing and projected operations at each airport. Maps describing the 65 db(A) CNEL contours at these facilities are provided in Appendix Maps 13-17. The maps include contours prepared for the Siskiyou County Airports at Montague, Weed, Scott Valley, Happy Camp and Butte Valley and the Montague-Yreka Municipal Airport and Mott Airport (City of Dunsmuir) as noise may impact unincorporated territory. A brief explanation of the technique used in developing noise contours for airports can be found in the Appendix.

The technique for assisting in the development of airport noise contours was published in 1973[9] when airport noise standards adopted by the State Legislature required the identification of noise levels to 65 db(A) (CNEL) for proposed new airports and vacated military airports under conversion to civilian use. In order to compensate for the 5 db(A) difference in the requirements of Section 65302(g) and the available information, without extensive noise monitoring, the contours have been amended with later information and a technique described in the Appendix.

The CNEL scale takes into account the magnitude of noise from each flyby, its duration, the number of flybys, and how the total number is distributed over the day, evening and nighttime hours. In lieu of measured data, the noise contours are estimated, for planning purposes, based on the type and number of aircraft operating from the airport, their flight paths and time of operation. The method used in this report considers only one runway and defines the noise impacts in terms of non-jet or mix of jets and general aviation propeller aircraft, the number of operations weighted by the times of occurrence.[10]

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[9] Simplified Procedures for Estimating the Noise Impact Boundary for Small and Medium Size Airports in the State of California. Report to the California Department of Aeronautics (May, 1973) prepared by Wyle Laboratories, El Segundo, California.

[10] Wyle Report, pp. 3 and 4.

TABLE 5: SUMMARY OF CURRENT (1978) AIRPORT OPERATIONS IN SISKIYOU COUNTY

| AVERAGE DAILY OPERATIONS | SISKIYOU COUNTY (MONTAGUE AREA) | WEED | SCOTT VALLEY | HAPPY CAMP | BUTTE VALLEY | MONTAGUE-YREKA MUNICIPAL | MOTT[1] (CITY OF DUNSMUIR) |
|---|---|---|---|---|---|---|---|
| By Engine Horseposer | | | | | | | |
| < 200 | 20 | 8 | 12 | | 1 | 13 | 7 |
| 200-500 | 4.5 | 1 | 8 | 4 | | 11 | 2 |
| 500-2000 | | 1 | 5 | 3 | | 1 | 1 |
| Jets (specify) | 0.5 (727,737) | | | | | | |
| Estimated Daily Operations | 25 | 10 | 25 | 7 | 1 | 25 | 10 |
| Based Aircraft | 30 | 12 | 13 | 2 | 0 | 25 | 10 |
| By Hours of Operation | | | | | | | |
| 1700-1900 | 21 | 8.5 | 23 | 7 | 1 | 25 | 10 |
| 1900-2200 | 3 | 1 | 1 | 0 | 0 | 3 | 2 |
| 2200-0700 | 1 | 0.5 | 1 | 0 | 0 | 1 | 1 |

[1]Mott Airport operations are highly variable. The estimate is between 0 and 20 flights per day. Because of this, and since Mott is near urban development, the horsepower ratings and hours of operation are reflected toward the "high" part of the range.

TABLE 6: SUMMARY OF PROJECTED (1995) AIRPORT OPERATIONS IN SISKIYOU COUNTY

| AVERAGE DAILY OPERATIONS | SISKIYOU COUNTY (MONTAGUE AREA) | WEED | SCOTT VALLEY | HAPPY CAMP | BUTTE VALLEY | MONTAGUE-YREKA MUNICIPAL | MOTT (CITY OF DUNSMUIR) |
|---|---|---|---|---|---|---|---|
| By Engine Horsepower | | | | | | | |
| < 200 | 40 | 36 | 18 | 2 | 5 | 55 | 16 |
| 200-500 | 9 | 7 | 11 | 7 | 0 | 41 | 3 |
| 500-2000 | | 2 | 6 | 6 | 0 | 4 | 1 |
| Jets (specify) | 1 (Business) | 2 (1.5 turbofan, 0.5 business) | | | | | |
| Estimated Daily Operations | 50 | 47 | 35 | 15 | 5 | 100 | 20 |
| Based Aircraft[1] | 60 | 32 | 35 | 10 | 5 | 100 | 20 |
| By Hours of Operation | | | | | | | |
| 0700-1900 | 43 | 37.5 | 30 | 15 | 5 | 92 | 15 |
| 1900-2200 | 4 | 7.5 | 3 | 0 | 0 | 3 | 2 |
| 2200-0700 | 3 | 2 | 2 | 0 | 0 | 3 | 2 |

[1]Figures are revised from the CALTRANS projections contained in the Siskiyou County Regional Transportation (1975) based on discussions with County Airport officials and TerraScan projections.

In order to apply a standard methodology to the problem, certain constraints which apply to small and medium sized airports in Siskiyou County include the number of weighted operations (less than 2,000) the proportion of jet traffic (20% of weighted total,) noise emissions not exceeding that of a Douglas DC-9 or Boeing 737 for short flights (500 miles or less) and straight flight tracks. While operations at County (and City) Airports currently do not approach these constraints, it is a consideration in the projection of future activities to 1990 and 1995.

## Current and Projected Airport Operations

The following information has been prepared for seven airport facilities in Siskiyou county. Five airports are owned and operated by the County of Siskiyou under the responsibilities of the Airport Manager for operation, and the Department of Public Works for maintenance, planning and development. The County Planning Department maintains maps and profiles on airport approach zones and administers the Zoning Ordinance requirements for development within them.

The tables on the following pages summarize existing (1978) and projected (to 1995) airport operations.

It should be noted that there is a fairly close relationship between the number of daily operations and based aircraft (local). This close ratio has been projected to determine the future operations. It is extremely difficult, of course, to forecast the numbers of operations and based aircraft to 1995. Because of this difficulty, it will be important to relate any proposed development within the projected 65 db(A) (CNEL) contours to current estimated noise impact and upgrade the projected contours with available information.

Increased aircraft usage would not necessarily be directly related to the rate of population increase in Siskiyou County.[11] Increased income levels and professional firms and individuals have a direct bearing on aircraft usage, as well as the development of recreational resources. In the projection of activity at the Weed Airport, for example, consideration is given to increased recreational and residential development in the southern part of the County.

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[11] Extending the 1977-1990 projected annual County growth (1.8%) to 1995 shows a population growth of approximately 32% to 1995. This is compared with a possible 167% growth in airport usage (103 to 275 average daily operations) during the same forecast period. It must be understood that the usage projections are based only on reliable estimates, they are not based on any study of past activities, economic growth and other factors, including the appraisal of airport capabilities, facilities and capital programs.

The following portion describes the general activities, present and projected to 1995, for the seven airports operating in the County.

Siskiyou County Airport (Montague Area)

The Siskiyou County Airport, approximately four miles northeast of Montague, is the major airport in the County. It is located at the north end of the Shasta Valley on Class III soils which are capable of supporting a variety of agricultural activities.

The Airport is classified as a basic transportation facility by CALTRANS (California Department of Transportation) and provides accomodations for all general aviation, including business jets. The runway is 7,484 feet, paved and lighted. Thirty aircraft are presently based there, with an average daily activity at approximately 25 operations. Currently, the most significant noise is produced by up to four jet operations (Charter Boeing 727's and 737's) on the weekends for land sale promotion, primarily at Lake Shastina.

It is projected that up to one business jet will be using this facility on a daily average by 1995. Air carrier service, including jet aircraft, is possible by the end of the forecast period, however, the projected contours do not envision regular jet service to the Yreka area. In the event that regular jet service is provided, the projected contours will need revision. The projected 50 future daily operations (see Map 14, Appendix) is adaptable to regular propeller private carrier service on a daily basis (such as Nor-Cal or Eureka Aero, using smaller twin-engine aircraft.)

Weed Airport

The present Weed Airport is 3,700 feet long, paved and lighted. It is located parallel to Interstate 5, approximately six miles northwest of Weed. From the facility there is convenient road access to Mount Shasta, the Shasta-Trinity and Klamath National Forests, Lake Shastina and other potential summer and winter recreational and residential developments. There is also access to the College of the Siskiyous in Weed. Geographically, the Weed Airport is more central to the recreation oriented individual or firm than the larger County Airport.

The Weed Airport is located in an area of Class III soils. Present agricultural uses are limited by water availability, however, the area is potentially irrigable. In terms of the service area, there are few physical development constraints in the Weed and Mt. Shasta City areas. Therefore, the Weed Airport is favorable located with respect to future general planning considerations (access, development potential and recreational interest.)

In 1973, the Siskiyou County Board of Supervisors purchased land sufficient to permit the physical development of an

8,000 foot runway, adjacent to the present runway. This action was based on the premise that such a facility may be needed within the 20 year period to 1993-95 in order to accomodate increased activity including jet operations.

The noise contours projected for the Weed Airport show a 3% jet mix on the proposed new facility (see Map 14, Appendix). Assuming such action, it is important to consider the projection of non-jet operations until the new runway is developed. The proposed contours indicate possible future activities on both runways.

Scott Valley Airport

The Scott Valley Airport is situated three miles directly south of Ft. Jones in Scott Valley. It is located on Class III soils in the heart of an extensive agricultural region. The airport is also located in a flood hazard area as determined by U.S. Department of Housing and Urban Development (HUD) Flood Hazard Boundary Maps prepared on the basis of a flood frequency of once in 100 years.

The runway is 3,000 feet long, paved and lighted. Currently the daily operations are twice the number of based aircraft because of flying school activities. There is a potential for increased private aircraft (basic utility propeller units) operations in Scott Valley; however, it will be constrained by the amount of land to be reserved for agriculture. For contour definition see Map 15 in the Appendix document.

Happy Camp Airport

The Happy Camp Airport is the closest County Airport to a concentration of residential development (see Map 1, Appendix). While daily operations are expected to double by 1995, it is not expected that the noise effect (contours) will be significantly increased. This is attributed principally to the lack of lighting facilities restricting operations to daytime hours.

The airport is located about one-half mile from the center of the Happy Camp community. The high school is approximately 0.4 mile from the facility, lying along an extended line from the runway centerline. The 65 db(A) (CNEL) landing contour for a northeast touchdown on the end of the runway is quite close to several homes. It is significant that most landings are from the opposite end, where there is no nearby development, and most touchdowns occur one-fourth to one-sixth distance from the end of the runway. However, the contour is drawn from the end of the runway in this case because it would appear to more closely approximate 60 db(A) (CNEL) with normal touchdown.

Butte Valley Airport

The Butte Valley Airport is located nearly mid-way between Macdoel and the City of Dorris (approximately four miles

north of Macdoel). The facility is located on land owned by the Klamath National Forest within the Butte Valley Land Use Project- a proposed wildlife habitat area.

The runway is 4,300 feet, paved and lighted. It currently has no based aircraft and only one aircraft operation is estimated on a daily basis. The projection of five daytime operations by 1995 will not change the estimated noise contours (see Appendix Map 16).

The surrounding areas of Butte Valley are agriculturally oriented with considerable Class III soils and low demand for an urban based economy. Airport activities are not expected to have noise impacts on private property.

Montague-Yreka Municipal Airport

The Montague-Yreka Municipal Airport is located within the City of Montague. However, noise emissions also have potential effects on unincorporated areas. The two paved runways are 3,000 feet and less; however, because of the proximity to the urban population in Montague and Yreka, the city agencies expect to extend the runways up to 4,200 feet. Physical barriers (roads, railroad and Oregon Slough) prevent extension much beyond this length without major alterations to improvements and/or land forms.

As the noise impact map indicates, both existing and projected 65 db(A) (CNEL) noise levels involve both public (road) and private properties in the unincorporated County. No existing dwelling units are affected by these levels. Since the area is quite open and undeveloped, it may also be assumed that no current dwelling unit is within the 60 db(A) (CNEL) impact level. In order to more closely satisfy the requirements of the 60 db(A) (CNEL) definition, current and projected landing contours are also shown for zero point touchdown on all approaches over unincorporated territory.

The projected contours do not envision future jet activity. In the event any jet aircraft are contemplated on a regular basis (including business jets,) the noise contours will need revision, either by a similar estimation technique or by actual monitoring.

The planning for runway extension(s) envisions a considerable increase in local air traffic. Current average daily operations are expected to increase four-fold to 100 by 1995 according to the Regional Transportation Plan. This increase will occur predominantly in light aircraft under 500 horsepower and evening and night traffic is expected to remain minimal (the present runways are lighted).

Mott Airport

The Mott Airport is owned and operated by the City of Dunsmuir. It is located at the northern extremity of the City above the

Sacramento River Valley, approximately 3.5 miles south of Mt. Shasta City. While it is located in an urbanizing area, the existing and projected 65 db(A) (CNEL) noise contours do not affect existing residences. Projected 1995 contours would have minimal noise impacts on unincorporated private lands unless regular landing touchdowns occurred at or near the end of the extended runway (see Map6, Appendix).

The Regional Transportation Plan does not indicate an increase in the number of based aircraft from 1975 to 1995.[12] Because of the possibility of increased residential development, particularly in the Mt. Shasta City area, as well as improved/expanded summer and winter recreational opportunity, it would appear that the market exists for increased operations.

Few, if any, physical constraints prevent increased development in the Mt. Shasta City area. Infrastructural service limitations particularly in the form of storm water infiltration into both Mt. Shasta City and Dunsmuir sewage treatment facilities, limit current growth activities. Other minor restraints include water distribution, school capacity and increased traffic impacts. However, these matters are within the scope of correction and it is entirely feasible that the demand will require expansion of Mott Airport, which will permit greater utilization.

Airport Noise - A Summation and Appraisal

The projected increase of Siskiyou County population is from 36,500 in 1977 to 45,000 in 1990. While not a particularly high growth rate, it should be sufficient to generate the initiation of regular air service to Siskiyou County.[13] It is assumed that initial service will be provided by a carrier using small twin-engined aircraft. Such service may be provided at either the Weed Airport or the County Airport north of Montague, or both.

Total airport usage may increase at a rate up to five times normal population growth. This will be reflected partly in the use of single-engined private aircraft by local residents. This assumes an increased income and professional level as a significant component of the growth factor. More people will also use airplanes for access to Siskiyou County's recreational resources.

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[12] It was difficult to estimate average daily air traffic at Mott Airport. The range of operations is from 0 to 20 according to one source. A review of daily flight activities would be necessary to precisely define an average figure.

[13] A May, 1974, survey by the Weed Chamber of Commerce indicated substantial interest in commercial air service.

As indicated earlier, noise impact boundaries, both for existing and projected 1995 operations, do not affect identified existing residences on the basis of the examination of recent aerial photography (1973 and 1975). The most significant noise source at airports involves jet operations. Only one airport, the Siskiyou County Airport near Montague, is capable of serving jet traffic. It is fairly safe to assume that jet activities will continue at the County Airport. It would, therefore, be appropriate to consider either controlling land use or maintaining open space in an alternative program within the defined 65 db(A) (CNEL) contours around the County Airport.

It may also be assumed that the Weed Airport will be expanded to service increased air traffic resulting from development in the mid and south county areas. It is somewhat less certain to assume regular jet aircraft activities. For this reason, it would be premature to restrict land use solely on the basis of projected noise contours developed from a jet aircraft component.

Protection within the 65 db(A) (CNEL) and approximated 60 db(A) (CNEL) noise contours at all County Airports and Municipal Airports with potential noise impacts on unincorporated county territory may be provided by several methods:

1. Purchase of land within the projected 60 db(A) (CNEL) noise contour. This is the most effective means of assuring protection from conflicts for the airport operator and protection from property depreciation for the landowner

   It should be noted that, pending field investigation, it is possible that some units may be within the defined noise impact boundaries. Units may have been constructed, or mobilehomes installed, after 1975, and older units may have been hidden by trees or shade on the aerial photos.

   The Federal Aviation Administration (FAA) has published the "Aviation Noise Abatement Policy (November 18, 1976)" for the purpose of reducing jet aircraft noise emissions. This will be accomplished by "retrofitting" existing carriers exceeding 75,000 pounds not meeting FAA Regulations, Part 36, Noise Levels. The modifications on existing aircraft not meeting these noise levels will proceed from 1981 through 1985. However, this policy does not address the noise impact of lighter jet aircraft, many of which are capable of using Siskiyou County Airport. As an example, the 2-engined Sabreliner and Lear Business Jets produce as much takeoff noise as the DC-9 and 737.

2. Purchase of easements to assure the non-development of affected property.

3. Zoning in compliance with the projected 60 db(A) contours to restrict development. Dependent on other planning

factors, the extent of potential noise impact into individual parcels, the size of parcels and the appropriate general plan land use density, development may be designed with density credits applied to portions of parcels not adversely affected by potential noise. The transfer of development rights (TDR) is also a technique that may be considered for entire parcels affected by estimated noise values and resultant zoning.

The first approach is the simplest and most costly. In Siskiyou County with few, if any, existing improvements within defined noise level areas, the cost may not be exorbitant. Purchase by the operator has the advantage of using the property for a non-residential, airport related use- provided that the use does not extend the airport impacts to existing development.

It is not expected that airport noise in Siskiyou County will become so oppressive as to require mitigation in building design and construction. Standard 2 x 4 wall construction, with normal window spacing and size, will reduce noise by 28-33 db(A). Through design and additional insulation, noise may be reduced up to 41 db(A). Assuming that interior noise levels should not exceed 45 db(A) (Ldn),[14] exterior noise may reach 73 to 78 db(A) in units of standard construction.

[14] Title 24 of the California Administrative Code (Section T25-1092(a) (2)) requires that interior CNEL with closed windows, attributable to exterior noise sources, shall not exceed an annual CNEL of 45 db(A) in any habitable room.

## STATIONARY SOURCES

The only noise sources for which complaints have been registered are lumber mills and rock crushers. Stationary sources of noise are more easily identified and accountable than excessive traffic noise or railroad operations. Because of their proximity to residential areas, the lumber mills in McCloud (Champion International) and Mt. Shasta City (Kimberly Clark Corporation and Coopers Mill) were given particular attention. Separate noise recordings were not performed at mills in Happy Camp and Yreka because the operations appeared to be significantly distant from residential concentrations. Complaints were received on two operations located within the City of Yreka affecting residents in the unincorporated county. The mill operation on Highway 3 is within a recently annexed area to the City of Yreka; therefore, the present unincorporated county residents appear to be significantly distant from the noise source. A lumber operation on Oberlin Road affecting a nearby mobilehome park was not in operation when sound recording equipment was available.

The following analysis focuses on the three mills for which data is available:

Champion International, McCloud. Recordings were performed on March 30, 1978, a Thursday, during the mid-afternoon.[15] The two recording locations are identified on Map A-8. At the initial location (Junction and Tucci) a range of 60-72 db(A) was established for noise emanating from an air fan associated with an operation approximately 600-800 feet from the recording location. Applying a formula for estimating sound drop-off rates from point sources[16] provides an 11 db(A) reduction at 178 feet. The estimated 60 db(A) noise contour is shown on Map A-8 and includes six existing residences and five vacant lots. The 65 db(A) noise contour appears to affect four residences at a distance of 100 feet behind the recording point.

The major part of the Champion International operations, including the sawmill, are located nearly one-half mile to the northeast of the major residential area of McCloud. The second recording location was selected on Mill Street near a subdivided area consisting of 61 housing units. The data received indicates a noise effect range from 54 to 62 db(A) (see Appendix Map A-9). Using the estimated sound drop-off rate indicates the 60 db(A) noise contour at 63 feet behind the recording location. This indicates that no housing units are affected by adverse noise in this vicinity on the basis of activities recorded.

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[15] Recordings were performed using a Simpson Sound Level Meter Model 885.

[16] Fundamentals and Abatement of Highway Traffic Noise, DOT (1973,) Table 1.3, Page 1-32.

Coopers Mills, Inc., Mt. Shasta City Area. Coopers' Mill is located approximately 0.4 miles north of the City of Mt. Shasta with access from Ski Village Drive and Butte Avenue. Sound recordings were performed on March 30, 1978 in the early afternoon. The location was selected near existing residential units on Ski Village Drive, east of West Road. The recordings range from 44 to 66 db(A) for actual mill operations. Six housing units are included within a 556 foot radius of the center of milling operations. This includes an additional 56 feet for a 1 db(A) reduction to the 65 db(A) level. Allowing for a 6 db(A) reduction to 60 db(A) increases the radius to 600 feet. This contour is sufficient to include one additional housing unit whose occupants are subject to adverse noise.

Kimberly Clark Corporation, Mt. Shasta City Area. Kimberly Clark mill is located on South Mt. Shasta Boulevard, approximately 0.3 mile south of the City of Mt. Shasta. The sound recording was performed on March 30, 1978 in mid-afternoon (2:15-24 p.m.). The location selected was immediately north of a motel from which complaints of excessive noise from a debarking operation have been registered. The sound recordings indicate a 62-76 db(A) range which may or may not be perceptive within the interior rooms of the motel.[17] Applying the sound drop-off rate formula from the recording point requires an additional 316 feet in order to approximate a 16 db(A) reduction to 60 db(A). No housing units, aside from the motel operation, appear to be within this 60 db(A) noise level.

Summary. Stationary sources of noise production have minimal effects on residential areas in terms of the low number of housing units adversely affected. Thirteen housing units and an estimated 33 persons represent only 1.1% of the total unincorporated county population subject to 60 db(A) noise or greater. Associated operations to sawmills, such as log truck activities, are occasionally perceived as a noise or traffic problem; however noise contours prepared for State and County highways and streets include the truck component and are therefore considered in the noise climate evaluation. Intrusive noise, such as whistles or buzzers designating changing shifts at mill operations, can also be irritating. However, because of their short duration and relatively negligible effect in relation to continual high noise volumes, they are not considered in this study.

Noise Sensitive Places. Certain land uses, such as hospitals, libraries and schools, are more sensitive to noise than others because of the importance of quiet as a resource to education and recuperation. Because of the intensive effect of noise on necessary activities such as sleeping, relaxing, reading, teaching, studying and talking, land uses upon which these activities are dependent must be protected.

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[17] Standard construction should reduce exterior noise effect by 28-33 db(A). This would achieve sound attenuation to 48 db(A).

Areas deemed noise sensitive shall be determined by monitoring according to noise element requirements. In the unincorporated part of Siskiyou County several places have been identified from noise contour estimations as noise sensitive. These include:

1. Happy Camp Elementary School located between State Highway 96 and Second Avenue in Happy Camp. For location see Map A-1, Appendix.

2. Happy Camp High School located on Indian Creek Road, approximately 1,000 feet north of Highway 96 in Happy Camp (Map A-1).

3. Mt. Shasta City Park, a community park, located on North Mt. Shasta Boulevard approximately one-half mile north of the City of Mt. Shasta (Map A-4).

Three other places have relatively small areas where adverse noise effects do not reach building (classroom) areas or where a unique situation exists not requiring separate noise readings. The first two places are the McCloud High School and a small neighborhood park in McCloud at the corner of Colombero Drive and Shasta Avenue. Both places are influenced by 60 and 65 db(A) noise calculations from existing and projected traffic on East Colombero Drive (see Map A-8). The 60 db(A) noise effect along Colombero Drive is expected to increase only from 125 to 130 feet of the travelled way by 1990. The 65 db(A) noise contour is shown to increase from 35 to 37 feet in the same period. The nearest classroom at McCloud High School to Colombero is set back 400+ feet from the travelled way; therefore, the classroom walls should maintain the required minimum 45 db(A) from exterior sources. Approximately 30% of the 4-1/4 acre neighborhood park is influenced by the 60 db(A) noise level. Both passive (picnic area) and active (play equipment area) recreation facilities are provided in the park.

The final place studied, the Macdoel Elementary School, is located within the 60 db(A) noise contour determined from the Southern Pacific Railroad activities. However, since the contour is heavily weighted (10 times) by night time rail activities the sensitivity could not apply to normal day time teaching at the school.

The sources of environmental noise affecting each noise sensitive place are primarily traffic generated. More information describing each place and the noise measurement findings are provided in the following.

Happy Camp Elementary School. The source of potential noise was identified primarily as highway traffic generated from State Highway 96 from the modification of CALTRANS ($L_{10}$) noise contours for 1974 and projected to 1995. Noise recordings were taken on May 29, 1978, Memorial Day, between 11:30 a.m. and 12:00 noon. Weather conditions were clear with little wind. The location of recording was at the exterior classroom wall nearest to the highway - a distance of approximately 200 feet. The school was designed with classrooms located away from the highway and the play areas (softball diamond and play apparatus) in the open space between the highway and building area with little vegetative buffering.

Play activites, however, may not be particularly noise sensitive since they themselves produce considerable noise. Children at play may not be particularly sensitive to highway noise as long as they are protected physically from the vehicles and their other effects (e.g., dust production, exhaust emissions).

Noise contours indicate only projected 1995 60 db(A) level (Ldn) to reach the first classroom exterior wall. The normal noise reduction achieved by wood constructed walls is 25 db(A) may be exceeded on occasions. The protection of such levels from classroom interruption is dependent on the insulation qualities of the classroom wall, and the proportion of open windows to total exterior surface (windows are oriented away from the highway).

Happy Camp High School. Traffic along Indian Creek Road is the source of potential adverse noise upon the high school. A nomograph technique was used to estimate noise effect (see Map 1, Appendix). This approach indicates the extent of the 60 db(A) Ldn level at 15 feet both at current and projected (1990) traffic levels. This noise value should not adversely effect classroom activities at the school although the nearest classroom is 45 feet from the traveled way. The noise insulation of the classroom wall should reduce noise by 25 db(A) or greater provided that windows are not opened entirely to receive the noise effect.

Mt. Shasta City Park. This community park of approximately 15 acres provides both outdoor and indoor recreational and social facilities. Modified CALTRANS estimated contours indicate nearly one acre of the southwest part of the site within the 1974 60 db(A) noise level. Noise contours projected for 1995 indicate an increase to 4.5 acres, including the field and playground areas within this noise level.

Noise readings taken on a Saturday indicate a range of 48-74 decibels with an average of 57 at a location near Interstate 5 occupied by childrens' play equipment and a soft ball diamond. A recording in the central area of the park (picnic area), further from the freeway, failed to show a lessening of the traffic noise effect (range 52-68, average 58). An explanation for the similar noise effect at widely separated distances may be the direct and open (unobstructed) exposure from freeway noise at the second location compared to a somewhat protected (tall pine trees) environment at the first location near Interstate 5. It is estimated that the 60 db(A) level is exceeded 30% of the time and the 65 db(A) level is exceeded 6-7% of the time at the above locations.

The primary source of intrusive noise, which may have an effect on park users, is diesel trucks. The rhythmic sounds of automobile traffic are not disruptive to outdoor play activities although picnic and other more passive activities may be affected to some extent depending upon individual sensitivity and requirements of the outdoor experience (solitude or communication with others).

The park may also be affected by traffic noise emanating from North Mt. Shasta Boulevard and the Southern Pacific Railroad. According to the noise contours developed from the nomograph technique using one-day traffic counts and an estimation of 10% truck traffic, the entire park is influenced by adverse noise (60 db(A) level). The 65 db(A) noise level is projected to increase from 250 to 440 feet of the traveled way by 1990. This involves approximately 5% of the park currently and slightly over 50% of the park in 1990. Rail activities also produce noise effects including the entire facility. The 70 db(A) noise level affects approximately 60% of the park (see Map A-4). However, since railroad noise contours have been developed with a 10 times greater emphasis on night time activities, and park activities are confined to day and evening hours, the actual effect of railroad noise on the park is considerably diminished.

Another important moderating factor, is the relatively dense stand of pine and other trees providing both visual separation and sound attenuation from both road and rail noise to the north and east of the park. It is suggested that a maximum reduction of 10 db(A) is acceptable for 200 feet of woods depth.[18] This would effectively reduce the noise influence (60 db(A)) from North Mt. Shasta Boulevard to 75 feet and 150 feet by 1990. Since the park is approximately 200 feet from the road, the adverse noise effect may be disregarded.

From the previous information and analysis it is concluded that noise from exterior sources is not harmful to normal classroom (teaching, reading) activities at several schools in unincorporated Siskiyou County. Adverse noise effects from Interstate 5 at Mt. Shasta City park were recorded resulting primarily from diesel truck activities. Adverse noise (60 db(A) or greater is experienced approximately 30% of the time. This may affect the quality of some recreation activities (picnicking, other passive leisure and park appreciation). Noise from other sources (North Mt. Shasta Boulevard and the railroad) appear to be adequately modified by a fairly heavy stand of pine and other trees. Some higher noise levels are also experienced at a neighborhood park in McCloud but are probably not significant to most children enjoying the play facilities.

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[18] The park is covered by 60% woods area with recreational/social structures and the access road developed in it. A U.S. Department of Transportation (DOT) report (1973), Fundamentals and Abatement of Highway Traffic Noise indicates that 5 db(A) attentuation (reduction) for a 100 foot depth of woods is acceptable provided no visual path exists (openings) through the depth. The woods should extend at least 15 feet above line-of-sight to the traffic. An additional 100 feet depth of woods may provide an additional 5 db(A) attenuation, but the total claimed attenuation should not exceed 10 db(A) in any configuration (Page 1-13).

Summation of Total Noise Effect. This part summarizes the total population affected by various adverse noise sources. Tables are provided to show that some housing units and occupants are affected by more than one source of noise. It is important to account for this to prevent "double-counted" units which would inflate the total population subject to higher noise levels. In order to identify units and population subject to two or more noise sources, it was necessary to assign units to a priority noise source. The priority selection is somewhat arbitrary.[19] There has been no attempt to select one noise source over another as being more significant in terms of assignment. For the purpose of preventing "double-counting," therefore, the assignment of housing and population to noise sources is as follows:

1. Railroads
2. State and Federal Highways
3. County Roads and Streets
4. Stationary Sources
5. Airports

Before proceeding into the presentation of current and projected summary noise effects from all sources according to the priority selection, above, it is important to first summarize into two tables the population affected by adverse noise from each source as presented earlier in this chapter. This table will include the "double-counting" effect and is therefore important in order to identify the difference based upon a more realistic effect of noise applied to the total population.

Table 7: SUMMARY OF POPULATION IDENTIFIED WITHIN INDIVIDUAL NOISE EFFECT SOURCES BY VARIOUS NOISE LEVELS, UNINCORPORATED SISKIYOU COUNTY, CURRENT (1977) AND PROJECTED (190-95)
(Includes population subject to two or more noise sources; therefore some persons are counted more than once.)

CURRENT (1977)

| db(A) LEVELS | 75 | 70 | 65 | 60 |
|---|---|---|---|---|
| Noise Source | | | | |
| State & Federal Highways | 10 | 73 | 248 | 662 |
| County Roads and Streets | | 96 | 510 | 1,224 |
| Railroads | 22 | 186 | 649 | 1,482 |
| Airports | 0 | 0 | 0 | 1,482 |
| Stationary Sources | 0 | 0 | 24 | 33 |
| Totals | 32 | 355 | 1,431 | 4,883 |

[19] The selection is biased to some degree in terms of perceived national priorities. Railroads and Federal Highways must operate in times of national emergency.

TABLE 7: (Continued)

PROJECTED (1990-95)

| db(A) LEVELS | 75 | 70 | 65 | 60 |
|---|---|---|---|---|
| Noise Source | | | | |
| State & Federal Highways | 15 | 157 | 448 | 938 |
| County Roads & Streets | 0 | 119 | 685 | 1,451 |
| Railroads | 22 | 186 | 649 | 1,482 |
| Airports | 0 | 0 | 0 | 0 |
| Stationary Sources | 0 | 0 | 24 | 33 |
| Totals | 37 | 462 | 1,806 | 3,904 |

The following table accounts for those persons living in housing subject to two or more noise sources. It, therefore, represents a clarified picture of adverse noise effects applied to the unincorporated county population based on current and projected noise.

TABLE 8: SUMMARY OF TOTAL POPULATION AFFECTED BY VARIOUS NOISE LEVELS, UNINCORPORATED SISKIYOU COUNTY, CURRENT (1977) AND PROJECTED (1990-95)

CURRENT (1977)

| db(A) LEVELS | 75 | 70 | 65 | 60 | % TOTAL POPULATION |
|---|---|---|---|---|---|
| State & Federal Highways | 10 | 67 | 226 | 604 | 3.02 |
| County Roads & Streets | 0 | 66 | 384 | 863 | 4.31 |
| Railroads | 22 | 186 | 649 | 1,482 | 7.40 |
| Airports | 0 | 0 | 0 | 0 | |
| Stationary Sources | 0 | 0 | 13 | 5 | 0.02 |
| TOTALS | 32 | 319 | 1,272 | 2,954 | 14.75 |
| % County Uninc. Pop. | 0.16 | 1.59 | 6.35 | 14.75 | |

PROJECTED (1990-1995)

| | | | | | |
|---|---|---|---|---|---|
| State & Federal Highways | 15 | 152 | 432 | 905 | 3.73 |
| County Roads & Streets | 0 | 84 | 464 | 1,062 | 4.38 |
| Railroads | 22 | 186 | 649 | 1,482 | 6.11 |
| Airports | 0 | 0 | 0 | 0 | |
| Stationary Sources | 0 | 0 | 13 | 5 | 0.02 |
| TOTALS | 37 | 422 | 1,558 | 3,454 | 14.24 |
| % Est. County Uninc. Pop. | 0.15 | 1.74 | 6.42 | 14.24 | |

The preceding table more accurately defines population within specific noise levels and provides a percentage comparison to the total current and projected unincorporated county population.[20] The results of the two summary tables show several items. These general findings are presented below:

General Findings.

1. 447 persons are subject to adverse noise effects from two or more sources (15.1% total population affected). This increases the occurrence of noise and its characteristics which may intensify potential adverse effects on personal health, leisure and sleeping activities. Fortunately projected figures show only a slight increase to 450 persons subject to two or more adverse noise sources by 1990 provided new units are not developed in those areas.

2. The total unincorporated county population subject to higher noise will increase by 500 based on expected (projected) increases in noise effects. This growth, however, may be slower than the overall population growth rate since the percentage of persons subject to adverse noise may decrease from 14.75% to 14.24%. This decrease, however, assumes no further development of housing within noise impact areas.

3. The noise effect associated with traffic along all streets, roads and highways will increase relative to a reduction indicated for rail noise effects. This is based on projected traffic volume increases as opposed to an unknown future with respect to rail activities (rail activities projected as constant to 1990).

4. While projections, based on the assumptions and growth expected, show a slight decrease in the total percentage of unincorporated county residents affected by adverse noise, some of the higher levels (65 and 70 db(A) show a greater increase of population exposure than the overall growth rate (e.g., 70 db(A) population exposure increase from 1.59% to 2.11% of total population). Most of the State (CALTRANS) Highway increase is attributed to Interstate 5 (South Yreka and South Dunsmuir areas), Highway 97 (Weed, Carrick's Addition) and Highway 96 (Happy Camp). While I-5 projections are based on increased traffic through Siskiyou County, Weed and Happy Camp increases are based on expected increased trucking influences (logging and long haul traffic) and recreational uses, respectively.

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[20] No person can accurately forecast the future unincorporated county population since the major variable involves city annexation policies. The State Department of Finance estimates (1/1/77) 53.9% of the total county population to reside outside of cities or 20,022. This percentage is projected to 1990 for an unincorporated county population of 24,255 based on a total county projection of 45,000.

County road traffic noise effects at the higher levels (65 and 70 db(A) are expected to occur primarily in the Mt. Shasta City area.

The previous findings relate to the overall effect of expected increased noise volumes from all sources in the unincorporated parts of Siskiyou County. The following focuses on those findings specific to individual communities. In this sense, this part attempts to summarize the individual community noise analysis from the various sources of environmental noise provided earlier. Reference may be made to the concluding tables on pages 45-46 summarizing the total adverse noise effect by communities represented in the appendix maps.

Community Findings

1. Happy Camp is currently adversely affected by traffic noise generated primarily from a high proportion of truck (logging trucks) activities and recreational use. The community is adversely affected also because it is the only urban area in Western Siskiyou County and activities have become focused in Happy Camp. Available, buildable land is at a premium, because of physical constraints and competition for various uses including roads creates noise. In addition to the problem, many housing units are older or are mobile-homes with sometimes inadequate insulation to attenuate exterior noise.

2. Mt. Shasta City area presents a favorable situation with respect to future growth provided that municipal sewer and water facilities are extended to areas otherwise capable of accommodating growth. One of the problems that growth presents is added noise. In fact the Mt. Shasta City area is currently significantly affected by both rail and county road noise to the extent that it is experienced by the majority population (58.9%).

3. Dunsmuir, much like Happy Camp, is affected adversely by noise because of the competition for available land and the priority given to non-local needs (Interstate 5 and Southern Pacific Railroad). Nearly all (97.3%) of the unincorporated county population is adversely affected by these two noise sources. Since county traffic figures are not available in the Dunsmuir area, the effect of county road traffic is unknown. However, it may be assumed that some homes are affected by three adverse noise situations.

4. McCloud experiences noise effects from four noise sources. The most pronounced is traffic on county streets and railroad operations primarily serving the Champion International Lumber Mill - the major employer in the area. Approximately 45% of the community population is affected to some degree by adverse noise. This proportion is held in check somewhat by the buffering effect of row houses in attenuating noise movement

to interior houses on less used streets. The insulation qualities of older homes constructed to protect occupants from winter conditions may provide sufficient sound attenuation for acceptable interior quietness.

5. Grenada also is highly affected by railroad and county road noise (88% of the population) and may not have units as adequately insulated for sound effect as McCloud. Much of the housing in Grenada consists of smaller, older units and mobilehomes.

6. Hornbrook/Henley's population is affected by county road traffic noise, railroad operations and noise from Interstate 5 traffic. Approximately 64% of this community is affected by these sources. The recreational demand of the area (Klamath River and upstream reservoirs) are the primary causes of noise generation. New road improvements, as discussed earlier in the part devoted to county road noise, may provide a reduction or stabilization on this component of noise production.

7. Macdoel/Mt. Hebron is heavily affected by rail activities and their noise generation. Some units are also affected by highway traffic noise on Route 97. Nearly 86% of this community is influenced by adverse noise.

TABLE 9: ESTIMATED HOUSING UNITS AND POPULATION SUBJECT TO HIGH NOISE EFFECT (60 db(A) OR GREATER) BY VARIOUS NOISE SOURCES, UNINCORPORATED SISKIYOU COUNTY, 1977.

| MAP AREA | STATE HIGHWAYS | | CO ROADS & STREETS | | RAILROADS | | STATIONARY SOURCES | | TOTAL ALL SOURCES | |
|---|---|---|---|---|---|---|---|---|---|---|
| | UNITS | POPULATION | UNITS | POPULATION | UNITS | POPULATION | UNITS | POPULATION | UNITS | POPULATION |
| 1. Happy Camp | 60 | 165 | 76 | 210 | | | | | 136 | 375 |
| 2. Weed (Carrick) | 39 | 115 | | | | | | | 39 | 115 |
| 3. So. Yreka | 61 | 135 | 1 | 3 | | | | | 62 | 138 |
| 4. Mt. Shasta City | 1 | 3 | 41 | 100 | 96 | 230 | | | 138 | 333 |
| 5. No. Mt. Shasta | | | 31 | 80 | 21 | 50 | | | 52 | 130 |
| 6. No. Dunsmuir | 9 | 20 | | | 26 | 30 | | | 35 | 50 |
| 7. So. Dunsmuir | 45 | 100 | | | 149 | 362 | | | 194 | 462 |
| 8. McCloud | 5 | 13 | 126 | 332 | 124 | 325 | 6 | 16 | 261 | 686 |
| 9. Gazelle | | | | | 18 | 43 | | | 18 | 43 |
| 10. Grenada | | | 29 | 75 | 63 | 154 | | | 92 | 229 |
| 11. Hornbrook/Henley | 11 | 28 | 24 | 63 | 20 | 50 | | | 55 | 141 |
| 12. Macdoel/Mt. Hebron | 4 | 10 | | | 98 | 238 | | | 102 | 248 |
| 13. County Airport | | | | | | | | | | |
| 14. Weed Airport | | | | | | | | | | |
| 15. Scott Valley Airport | | | | | | | | | | |
| 16. Butte Valley Airport | | | | | | | | | | |
| 17. Montague-Yreka Airport | 5 | 15 | | | | | | | 5 | 15 |
| TOTALS | 240 | 604 | 328 | 863 | 615 | 1,482 | 6 | 16 | 1,189 | 2,965 |

TABLE 10: ESTIMATED HOUSING UNITS AND POPULATION SUBJECT TO HIGH NOISE EFFECT (60 db(A) OR GREATER BY PROJECTED VARIOUS NOISE SOURCES, UNINCORPORATED SISKIYOU COUNTY, 1990.

| MAP AREA | STATE HIGHWAYS | | CO ROADS & STREETS | | RAILROADS | | STATIONARY SOURCES | | TOTAL ALL SOURCES | |
|---|---|---|---|---|---|---|---|---|---|---|
| | UNITS | POPULATION | UNITS | POPULATION | UNITS | POPULATION | UNITS | POPULATION | UNITS | POPULATION |
| 1. Happy Camp | 106 | 290 | 91 | 251 | | | | | 197 | 541 |
| 2. Weed (Carrick) | 57 | 170 | | | | | | | 57 | 170 |
| 3. So. Yreka | 73 | 175 | 1 | 3 | | | | | 74 | 178 |
| 4. Mt. Shasta City | 3 | 7 | 81 | 210 | 96 | 230 | | | 180 | 447 |
| 5. No. Mt. Shasta | 3 | 8 | 33 | 85 | 21 | 50 | | | 57 | 143 |
| 6. No. Dunsmuir | 10 | 22 | | | 26 | 30 | | | 36 | 52 |
| 7. So. Dunsmuir | 45 | 100 | | | 149 | 362 | | | 194 | 462 |
| 8. McCloud | 7 | 18 | | | 124 | 325 | 6 | 16 | 263 | 691 |
| 9. Gazelle | | | | | 18 | 43 | | | 18 | 43 |
| 10. Grenada | | | 34 | 86 | 63 | 154 | | | 97 | 240 |
| 11. Hornbrook/Henley | 14 | 35 | 37 | 95 | 20 | 50 | | | 71 | 180 |
| 12. Macdoel/Mt. Hebron | 4 | 10 | | | 98 | 238 | | | 102 | 248 |
| 13. County Airport | | | | | | | | | | |
| 14. Weed Airport | | | | | | | | | | |
| 15. Scott Valley Airport | | | | | | | | | | |
| 16. Butte Valley Airport | | | | | | | | | | |
| 17. Montague-Yreka Airport | 15 | 40 | | | | | | | 15 | 40 |
| Other Communities | 12 | 30 | | | | | | | 12 | 30 |
| TOTALS | 349 | 905 | 403 | 1,062 | 615 | 1,482 | 6 | 16 | 1,373 | 3,465 |

[1]Existing units and estimated population within projected increased noise sources; does not include potential additional housing units developed on vacant lands within noise affected areas.

Classification of Communities into Consistent Land Use and Noise Environments.

The overall purpose of this section is to subdivide the various communities into equal noisiness zones outside of those areas subject to adverse noise. The approach is to conduct a community noise survey by monitoring the ambient[21] noise levels at various locations representing different land use situations. A secondary objective for noise monitoring is to provide an empirical spot check of mathematical predictions of noise exposure from major sources.

Once existing noise levels and land use relationships are established, they become the basis for determining the compatibility of proposed development with each environment.

Methodology

Table 11 on the following page identifies thirty locations of ambient noise levels recorded throughout the unincorporated parts of Siskiyou County. Most recordings were taken on a June Saturday afternoon when noise and activities in residential areas might tend to be more apparent. Generally 25 readings each at 10 second intervals provided ambient noise information. Ambient levels are described in three forms - the total range of noise experience from the lowest to the highest, the median and the mode expressed as the single (in some instances several) most frequently recurring noise values.

All thirty locations represent areas in exclusive residential use, a mixture of residential and other uses or is being prepared for residential development. Eighteen locations fall within existing adverse noise effect areas (60 db(A) or greater) as shown on various Appendix maps.

Median noise levels from recorded information are shown on each respective Appendix map for the community. The value is described within a circle for the particular location. Noise level estimates for other communities on the basis of similar land use environments are shown as a numerical median value without a circle. Because of the limitations in the study, it is difficult to estimate Ldn contours for areas believed to have a community noise exposure level below 60 db(A). For this reason, figures are provided on the maps at representative locations as an estimate of median noise values.

[21] The composite of noise from all sources near and far. Ambient noise level constitutes the normal or existing level of environmental noise at a given location.

TABLE 11: AMBIENT NOISE LEVELS, SISKIYOU COUNTY COMMUNITIES
(*Indicates locations within established adverse noise effect areas)

| LOCATION[1] | DATE/TIME | | RANGE[2] | MEDIAN | MODE | LAND USE | DENSITY[3] |
|---|---|---|---|---|---|---|---|
| DUNSMUIR | | | | | | | |
| *1. Elizabeth, 1 blk so. Dunsmuir Ave. | 6/16(Sat) | 11:40(a) | 46-58 | 50 | 50-52 | Residential, near I-5 | 0.77 |
| *2. At Dunsmuir & Elizabeth | Same | 11:45 | 48-76 | 57 | 54-56 | Res., scattered Com'l | 0.77 |
| *3. So. 2nd Ave., 50' e of So. 1st Ave. | Same | 12:00(p) | 56-68 | 59 | 58-60 | Residential | 1.53 |
| *4. So. 1st Ave., ent to Mobilehome Pk | Same | 12.10 | 50-70 | 53 | 50-52 | Res., mobilehomes | 1.28 |
| McCloud | | | | | | | |
| *5. Colombero & Quincy | 6/16(Sat) | 1:20 | 40-72 | 51 | 54-56 | Residential | 3.33 |
| 6. Shasta & Minnesota Ave. | Same | 2:20 | 44-70 | 52 | 48-50 | Residential, Near #89 | 2.64 |
| 7. Oak St. & Edgewood Court | Same | 2:35 | 38-60 | 45 | 44-46 | Residential | 1.78 |
| 8. At McCloud Elementary School[4] | Same | 1:45 | 42-52 | 46 | 44-46 | School, res. nearby | 1.25 |
| 9. At McCloud High School[4] | Same | 1:55 | 38-52 | 45 | 44-46 | School, res., vacant lots | 0.75 |
| *10. Broadway at Minnesota | 1/28(Sat) | 6:00(p) | 55-85 | 60,est | -- | Commercial | -- |
| 11. Minnesota at Highway 89 | Same | 6:15 | 55-75 | -- | -- | Ranger Sta., res. nearby | 2.64 |
| MT. SHASTA CITY | | | | | | | |
| *12. Beam Ave & Palmer | 6/16(Sat) | 3:05 | 46-60 | 51 | 50-52 | Residential | 1.29 |
| 13 400' w W.A.Barr bet Ream & Old Stage | Same | 3:20 | 44-62 | 51 | 52-54 | O.S., Rural Residential | 0 |
| *14 At Meadow Valley Dr/Mtn View Lane | Same | 3:30 | 44-56 | 47 | 46-48 | Res. units U.C., underdev. | 0.40 |
| *15 Pine Grove, 100' n. Lassen Lane | Same | 3:40 | 48-74 | 52 | 48-56 | Mix. Res., com'l, s-pub. | 0.23 |
| 16 Shilling & Crescent | Same | 3:50 | 46-64 | 51 | 50-52 | Res., open space (field) | 0.49 |
| *17 Old Stage Rd & Audubon | Same | 4:00 | 46-60 | 48 | 46-48 | Rur. Residential, Forest | 0.26 |
| *18. Off Old Stage, 0.4 mi w. I-5 | Jan, '78 | -- | 30-58 | -- | 55 | O.S., Rural Residential | 0 |
| GRENADA | | | | | | | |
| *19. Siskiyou Blvd & Shasta St | 6/16(Sat) | 5:30 | 50-76 | 55 | 54-56 | Residential, Com'l | 2.06 |
| 20. 3rd & 5th | Same | 5:40 | 44-68 | 51 | 50-56 | Residential | .60 |
| SOUTH YREKA | | | | | | | |
| *21. Shamrock Drive, near I-5 | Same | 6:00 | 50-72 | 58 | 54-56,60-62 | Residential | 0.40 |
| 22. Rolling Hills & Valley Drive | Same | 6:20 | 42-66 | 49 | 44-46 | Residential, Mobilehomes | 0.50 est |
| 23. DeWitt & Walters Lane | Same | 6:30 | 44-56 | 52 | 50-54 | Residential, Forested | 0.37 est |
| *24. Easy Street at Pruett | Same | 6:40 | 50-62 | 55 | 52-54 | Open Space, near Res. | 0.18 est |
| *25. Near Highway 3 & City Limits | 1/28(Sat) | 4:00 | 55-68 | 58,est | -- | Near Commercial | - |
| OTHER PLACES | | | | | | | |
| *26. Happy Camp, Davis & Crumpton | 1/28(Sat) | 1:00 | 50-80 | 55 | -- | Res. (mobiles), Com'l | 4.00 |
| 27. Weed, Carrick & Center | 6/16(Sat) | 4:25 | 48-64 | 53 | 52-54 | Residential | 1.41 |
| 28. L.Shastina Estates, L.S. & Lake Shore | Same | 4:50 | 46-72 | 51 | 46-48 | Low Density Residential | 0.30 est |
| *29. Gazelle, Old Highway 99 | Same | 7:00 | 52-74 | 56 | 54-60 | Residential, Commerical | 0.60 |
| *30 Macdoel, at Elem. School[4] | 5/22(Mon) | 7:00 | 46-52 | -- | -- | School, Rural Residential | 0.10 |

[1] See Maps 1-12, Appendix
[2] 25 to 50 recordings taken at 10 second intervals, see field sheets, Appendix pages.
[3] Housing Units per gross acre in neighborhood area based on latest land use information.
[4] Recorded with intent as possible noise sensitive place.
Source: TerraScan recordings, Simpson Model 867 Sound Level Meter

Limitations of the Study

Because of the large size of Siskiyou County it was not possible to obtain noise information for each of the many widely scattered communities. The major limitations inherent in the study are, therefore, listed as follows:

1. Existing ambient noise information is insufficient for the detailed development of noise contours among the many communities. For more representative records, weekday monitoring at commuter hours and other times are needed to accurately represent the community noise climate.

2. Figures have been developed from median ambient noise levels as determined from the one-time field survey. This indicates that the noise level figure for that location is exceeded 50% of the time. In order to more accurately determine the noise characteristics at each location it will be necessary to refer to Table 11 and Table 12, pages 48 & 52, which provide further information in summarized form from the field survey records.

3. The physical environment can modify noise effect. Stands of large trees retained in subdivisions (e.g., DeWitt Avenue in the South Yreka area) can reduce nearby noise effects. Topography as well as existing improvements such as the row houses in McCloud can reduce certain noise effects. Because of the variable factors involved within each community that tend to modify the noise climate, it is extremely difficult to arrive at a land use/housing density relationship that may be assumed to produce a particular ambient noise quality. As an example, the following summarizes the average median ambient noise levels recorded and compares them with average housing densities in each community:

| COMMUNITY | AVERAGE MEDIAN AMBIENT NOISE LEVEL | AVERAGE HOUSING DENSITY[a] |
|---|---|---|
| Grenada | 53.00 | 1.33 |
| McCloud | 49.83 | 1.95 |
| Mt. Shasta Area | 50.00 | 0.38 |
| South Dunsmuir | 54.75 | 1.19 |
| South Yreka | 54.40 | 0.29 |
| Other Places | 53.75 | 1.28 |

[a]Housing units per gross acre; housing is used in lieu of population estimates for residential density.

The foregoing shows little relationship between density and general community noise levels. South Yreka and South Dunsmuir, which are influenced by Interstate 5 traffic noise (discussed later), have considerably different average housing and population densities. It demonstrates an overriding regional noise effect created by I-5. However, areas such as Grenada, South Yreka and Mt. Shasta are highly vulnerable to outside noise because of the open character of the area which presents few topographic and vegatation sound modifications and encourages higher local and regional traffic speeds. McCloud, however, with a built-up urban density, experiences lower noise effects with higher density.[22] This results primarily from its locational advantage away from regional traffic and the establishment of an urban context which tends to minimize local traffic speed.

Land Use and Noise Effect

Using information provided in Table 11 median ambient noise for several land use categories and combinations of land use are feasible. These categories and the median values are summarized as follows:

| LAND USE CATEGORY | AVERAGE MEDIAN AMBIENT NOISE LEVELS |
|---|---|
| Residential[1] | 51.0 |
| Mixed Residential and Commercial | 55.0 |
| Commercial | 59.0 |
| Residential, under construction | 47.0 |
| Mixed Residential and Open Space | 51.0 |
| Open Space | 53.0 |
| Rural Residential, Forested | 50.0 |
| Schools (not in operation) | 45.5 |
| Totals | 52.3 |

[1]Excluding two sources adjacent to high noise production sources -- Interstate 5 (So. Yreka) and the Sacramento River (Dunsmuir).

A further review of residential and other categories with housing show only casual relationship between density and ambient noise. Generally areas with gross housing densities above 1.0 units per acre also exceed 51 db(A) median residential ambient noise levels.

The following table is to be used with Table 11 in order to estimate the noise characteristics at the areas for which recordings are available. These may be used as a measure of environmental

[22]This does not take into account rail activities which were not recorded in any of the communities surveyed.

noise during the evaluation of proposed projects and their noise impacts (See Project Evaluation Procedure, page 53).

TABLE 12 : SUMMATION OF EXCESSIVE NOISE LEVELS AT VARIOUS LOCATIONS OUTSIDE AND INSIDE PREVIOUSLY DEFINED ADVERSE NOISE EFFECT BOUNDARIES, SISKIYOU CO., 1978

| OUTSIDE ADVERSE NOISE LOCATIONS | MEDIAN LEVEL | % TIME NOISE LEVEL EXCEEDED 60 db(A) | CAUSES OF EXCESSIVE NOISE |
|---|---|---|---|
| 6 | 52 | 20.0 | Local traffic |
| 7 | 45 | 0 | |
| 8 | 46 | 0 | |
| 9 | 45 | 0 | |
| 13 | 51 | 4.0 | Not identified |
| 16 | 51 | 12.0 | Local traffic, aircraft |
| 20 | 51 | 15.4 | Local traffic |
| 22 | 49 | 10.3 | Local traffic, wind |
| 23 | 52 | 0 | |
| 27 | 53 | 11.5 | Barking dogs |
| 28 | 51 | 10.7 | Local traffic |
| Sub-Total | 49.6 | 9.1 | |
| INSIDE ADVERSE NOISE LOCATIONS | | | |
| 1 | 50 | 0 | |
| 2 | 57 | 39.3 | I-5, local trfc, arcrft |
| 3 | 59 | 12.0 | Siren, local traffic |
| 4 | 53 | 22.2 | Local traffic |
| 5 | 51 | 18.0 | Local traffic, wind |
| 12 | 51 | 0 | |
| 14 | 47 | 4.0 | Local traffic |
| 15 | 52 | 3.4 | Local traffic |
| 17 | 48 | 0 | |
| 19 | 55 | 20.0 | Local traffic |
| 21 | 58 | 38.0 | I-5 traffic |
| 24 | 55 | 12.0 | I-5 traffic |
| 25 | 58 | 3.4 | I-5, Hwy 3 traffic |
| 26 | 55 | -- | Local traffic |
| 29 | 56 | 16.0 | Local traffic |
| Sub-Total | 53.7 | 12.5 | |

The above information tends to support mechanically generated adverse noise effect data by showing that noise recordings within defined adverse noise level areas exceed those taken at other locations (by 4.1 db(A)). High noise levels at recording locations within adverse noise level areas exceed high levels outside those areas 12.5% of the time compared to 9.1%.

CHAPTER 3

# NOISE ELEMENT STANDARDS AND POLICY

The Siskiyou County Noise Element must be consistent with other elements contained in the General Plan. One of the most important areas of compatibility is the relationship between the Land Use and Circulation Elements and the Noise Element because of the noise effect of various land use activities. The proposed Land Use Element to the General Plan uses a system of development opportunity maps identifying those areas where various projects may locate with respect to the natural, physical carrying capacity of the land. Within identified spheres of influence of the nine cities of Siskiyou County and established community service districts the existing land use map shall prevail in terms of recommended land uses and intensities.

In planning for a community's noise climate, two considerations are important. Because of existing noise sources which are essentially fixed (such as freeways, major roadways and airports), certain areas may be unsuitable for some types of land use. It is therefore desirable to establish criteria for determining acceptable land uses for a given site with respect to noise compatibility. Limits must also be placed on the noise emissions of individual sources and land uses to insure that noise levels within any given land use remain within some determined level.

## Project Evaluation Procedure and Policy

In the evaluation of potential noise effects associated with proposed projects, the technique would be to determine the project noise effect (characteristics, intensity) and compatibility within the existing land use environment. It is important to determine the relationship between the project's noise production capability and the noise tolerance of the environment. This includes all aspects of a project's activities including the noise of generated traffic on the existing community or neighborhood or a proposed residential neighborhood on a designated land use map. Conversely, a project that is noise sensitive, such as a school or convalescent hospital, must also be evaluated in terms of the existing noise climate of the community and the proposed land use map. If a land use map recommends heavy noise generating activities, such as industrial or commercial uses not yet developed, it would be unwise to approve a noise sensitive project where it would be adversely affected by noise impacts if the land use plan is to be eventually achieved.

The procedure recommended in the evaluation of project noise effect or sensitivity is outlined as follows:

1. Determine the location of the project with respect to existing noise parameters. Refer to noise contour maps developed in this document for various communities. These maps identify noise effects created by significant generators such as freeways, highways, streets, airports, railroads and stationary sources. Also note the areas of equal noisiness shown on the maps as existing median ambient levels. In order to accurately determine the existing noise climate it will be helpful to identify current land use. Such maps should be maintained in the Planning Department or field investigation may be required to document the noise climate. Use the estimated median ambient noise generation of various land uses and densities (page 50). Require current sound readings if growth appears to have changed the designated ambient noise level for the particular area. Note that corrections may be added to the measured community noise level (CNEL or Ldn) according to Table A-10, Appendix document.

2. Determine the potential noise generating effect and its characteristics and/or the noise sensitivity (tolerance) of the project. Evaluate in terms of the existing noise environment in average day/night noise (Ldn). Apply the appropriate land use compatibility for exterior community noise (Table 13, next page). The County Zoning Ordinance may be amended to reflect land use compatibility criteria.

3. Relate the sound level reduction afforded by the type of proposed construction (if a construction project) to the acceptable interior noise level (45 db(A) for residential). See Table A-2, in the Appendix for sound level reductions and suggested interior noise levels for various land uses. If the project requires mobilehome occupancy, relate interior noise standards to the noise insulation of the unit (see page 21).

4. Adopt noise mitigation measures in borderline projects (e.g., those projects which may exhibit adverse noise characteristics, exhibit precedent setting examples in areas of little development or where cumulative noise impacts of otherwise acceptable individual projects are a concern). Mitigation may be accomplished through revisions in site design, building orientation and design, the application of sound attenuation medium (walls, screening) and adding insulation if the exterior noise levels are not of special concern for the particular activity proposed.

The following land use criteria are provided as the required response mechanism to the question "Is the projected noise effect of this project acceptable and in conformance with the General Plan?" In some instances reference to noise contour maps and equal noisiness zones will not provide the specific answer. It may be necessary to ask an applicant to provide noise readings, either as part of the environmental review process or an independent request through an appropriate mechanism (e.g., by ordinance or adopted standards for plan submission) or for the county staff to undertake specific noise recordings.

TABLE 13: LAND USE COMPATIBILITY FOR EXTERIOR COMMUNITY NOISE

| LAND USE CATEGORY | Noise Ranges (Ldn) 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Auditoriums, concert halls, amphitheaters, music halls<br>Passively-used open space (quiet or contemplation areas of public parks) | 50 | 50-55 | 55-70 | 70 |
| Residential. All dwellings including single-family, multi-family, group quarters, mobile homes, etc.<br>Transient lodging, hotels, motels.<br>School classrooms, libraries, churches.<br>Hospitals, convalescent homes, etc.<br>Actively utilized playgrounds, neighborhood parks, golf courses. | 60 | 60-65 | 65-75 | 75 |
| Office buildings, personal business and professional services.<br>Light commercial. Retail, movie theaters, restaurants.<br>Heavy commercial. Wholesale, industrial, manufacturing, utilities, etc. | 65 | 65-70 | 70-75 | 75 |

Noise Range 1

Acceptable land use. No special noise insulation or noise abatement requirements unless the proposed development is itself considered a source of incompatible noise for a nearby land use (i.e., an industry locating next to residential uses).

Noise Range 2

New construction or development allowed only after necessary noise-abatement features are included in design. Noise studies may be required if the proposed development is itself considered a source of incompatible noise for a nearby land use.

Noise Range 3

New construction or development should generally be avoided unless a detailed analysis of noise reduction requirements is completed and needed noise abatement features included in design.

Noise Range 4

New construction or development generally not allowed.

Land Use Planning Criteria and Development Policy

The United States Environmental Protection Agency (EPA) has published research findings regarding noise levels and their effects on people. Table A-6 summarizes the findings of this document. The three critical Ldn noise levels are 76 db(A) for hearing loss, 55 db(A) for outdoor activity interference and annoyance, and 45 db(A) for indoor activity interference and annoyance. The "activity interference and annoyance levels" were determined based on the maintenance of a noise level low enough so as not to interfere with normal speech, sleep, reading, eating, and listening to and watching television.

The 55 db(A) noise level is probably not feasible in communities adjacent to State Highways, Interstate 5, and the Southern Pacific Railroad, nor in the urban centers of McCloud and Happy Camp, which are affected by combinations of various noise sources including county arterials and streets. A set of noise levels, which will provide a reasonable noise climate within the county, yet not cause severe economic hardship in the development of land, has been derived. The outdoor noise levels suitable to various land use categories are indicated in Table 13. Table A-2, in the Appendix, indicates suggested interior noise levels. The exterior noise levels apply primarily in the areas most utilized for noise sensitive activities; for example, the patio and backyard areas of residences. These are maximum standards and are in no way intended to permit presently quiet areas to become noisier.

With regard to indoor noise levels, noise reduction as a result of general building type has been documented by the Federal Highway Administration; this information is contained below. This information coupled with the suggested interior noise levels contained in the Appendix, shall be used to design "quiet" into buildings and developments.

SOUND LEVEL REDUCTION DUE TO
BUILDING TYPE AND WINDOW CONDITION

| Construction | Windows | Noise Reduction From Outside Sources |
|---|---|---|
| All | Open | 10 db(A) |
| Light Frame | Ordinary, sash closed | 20 db(A) |
| Masonry | Single pane, closed | 25 db(A) |
| Masonry | Double pane, closed | 35 db(A) |

The recently adopted State Housing Act (Administrative Code, Title 25, Article 4) requires the following of non-single family detached residential units (duplex, triplex and 4-unit structures).

Noise Insulation from Exterior Sources:

1. Location and Orientation. Consistent with land use standards, residential structures located in noise critical areas, such

as proximity to select system of county roads and streets (as specified in Section 186.4 of the State of California Streets and Highways Code),railroads, rapid transit lines, airports, or industrial areas shall be designed to prevent the intrusion of exterior noises beyond prescribed levels with all exterior doors and windows in the closed position. Proper design shall include, but shall not be limited to, orientation of the residential structures, set-backs, shielding and sound insulation of the building itself.

2. Interior Noise Levels. Interior community noise equivalent levels (CNEL) with windows closed, attributable to exterior sources, shall not exceed CNEL of 45 dB in any habitable room.

3. Airport Noise Source. Residential structures to be located within an annual CNEL contour (as defined in Title 4, Subchapter 6, California Administrative Code) of 60dB require an acoustical analysis showing that the structure has been designed to limit intruding noise to the prescribed allowable levels. CNEL's shall be as determined by the local jurisdiction in accordance with its local general plan.

4. Vehicular and Industrial Noise Sources. Residential buildings or structures to be located within annual exterior community noise equivalent level contours of 60 dB adjacent to the select system of county roads and city streets (as specified in Section 186.4 of the State of California Streets and Highways Code), freeways, state highways, railroads, rapid transit lines and industrial noise sources shall require an acoustical analysis showing that the proposed building has been designed to limit intruding noise to the allowable interior noise levels prescribed in Section 125-1092(e) (2). Exception: Railroads where there are no nighttime (10 p.m. to 7 a.m.) railway operations and where daytime (7 a.m. to 10 p.m.) railway operations do not exceed four per day.

Since most residential structures (with windows closed and single pane glass) have the capability of reducing noise levels from exterior sources by 20 db(A), the State;s interior standard of 45 db(A) should normally be achieved when exterior levels do not exceed 75 db(A). It should also be noted that implementation of the State Act requires that the precise location of the 60 db(A) (CNEL) contour be known.

In certain cases where the functional use of a building is such that windows are not opened and outdoor areas are not used for any reason other than parking and walking into the building, outdoor noise levels might be ignored, and indoor noise level planning criteria may be more appropriate. Such building uses might include indoor auditoriums, certain public buildings, totally enclosed shopping centers, certain self-generative businesses, professional offices, banks, clinics and motels without outdoor pools or park areas.

In such cases, the suggested indoor noise levels are those indicated in Table A-2. The outdoor noise level planning criteria chosen assure that a 45 Ldn indoor level will be achieved by the noise attenuation of regular construction materials. Because the indoor noise level planning criterion waives the outdoor criteria, it is of utmost importance that noise studies, building plans and building inspections be very detailed and extensive to assure that the indoor criterion will be achieved. Improper design, choice of materials and/or improper installation of such materials can make them ineffectual.

The Occupational Safety and Health Administration (OSHA) and EPA have jurisdiction over occupational noise; OSHA allows a maximum Leq of 90 db(A) for an eight hour day. In view of the fact that these agencies are still debating the question of adequate occupational noise levels, and since OSHA has enforcement authority over these levels, it is recommended that the County of Siskiyou defer to the Federal authorities for consideration of occupational noise produced indoors.

Noise Emission Standards

Noise emission standards may be invoked for the following purposes:

to regulate any noise source (other than aircraft and motor vehicles operating on public thoroughfares) which causes violation of the standards;

to determine the suitability of land to be developed, considering the land use as a noise source or as a receptor.

Standards for ground transportation noise, Siskiyou County's major source of noise, have been established by State and Federal government agencies. The county can enforce ground transportation emission standards through its police powers. Table A-7 presents State standards for motor vehicles operating on public roadways; A-3 in the Appendix presents State standards for new motor vehicles at the time of sale. Table A-4 presents the State standards for motorboat noise emissions. Table A-5 presents criteria for maximum allowable noise levels from construction equipment.

Enforcement

1. It is recommended that one county office be given the responsibility for providing solutions to short-term noise problems. Currently, a number of offices have received noise complaints with little central authority for resolution of those problems. On the basis of this study and projections calling for increased urban development, it appears that the frequency of noise complaints will increase. The appropriate response mechanism to insure a healthy noise environment is the development and

successful operation of a noise ordinance.[23] Noise standards for various equipment are found in Tables A-3 through A-5.

2. Local Airport Land Use Commissions (ALUC) are required to develop a plan for noise compatible land use in the immediate proximity of airports. It is important that the Noise Element and the Land Use plans for various Siskiyou County airports, including city operated airports, be coordinated. Continued jet aircraft activities at the County Airport (Montague area) may require consideration of open space zoning. Residential structures proposed within the 60 db(A) (CNEL) contour of airports will require acoustical analysis (page 56).

3. State law requires noise insulation for new multi-family dwellings constructed within the 60 db(A) contour. The Office of Noise Control is supporting this program by conducting training seminars for building officials throughout the State and providing separate guidelines dealing with the determination of the degree of noise insulation in various dwelling constructions, improvement of sound insulation and development of a simplified test procedure to certify compliance. It is recommended that Siskiyou County take advantage of State assistance to apply these noise insulation standards. A copy of the Noise Element maps defining the 60 db(A) contours should be forwarded to the County Building Inspector.

Noise Element Relationships to Other General Plan Elements

The Noise Element is most closely related to the Land Use, Housing Circulation and Open Space Elements. Recognition of the interrelationship of noise and these four mandated elements is necessary in order to prepare an integrated General Plan. The relationship between noise and the four elements is briefly shown below:

Land Use: A key objective of the noise element is to provide noise exposure information for use in the Land Use Element. Section 65302(g) of the Government Code states that: "...noise exposure information shall be a guideline for use in development of the Land Use Element to achieve noise compatible land use." The Opportunities/constraint mapping format of the Land Use Plan provides a similar evaluation procedure to that of the Noise Element in that it indicates the environmental capabilities of a particular area to

[23] A model noise ordinance is being prepared by the State Office of Noise Control. The same office is also preparing a model inforcement workbook for use in conjunction with the model ordinance or other existing ordinances.

accomodate various land use activities. The Land Use Element, when integrated with the Noise Element, will show acceptable land uses in relation to existing and projected noise contours.

Housing: The Housing Element considered the provision of adequate sites for new housing and standards for the housing stock. Since residential land use is among the most noise sensitive land uses, the noise exposure information provided in the Noise Element must be considered when planning the location of new housing. Special insulation requirements for multifamily dwellings constructed within the 60 db(A) noise exposure contour may influence the location and cost of multifamily housing.

Circulation: The circulation system is one of the major sources of noise. Noise exposure will become a decisive factor in the location and design of new transportation facilities and the possible mitigation of noise from existing facilities in relation to existing and planned land use.

Open Space: Excessive noise can adversely affect the enjoyment of recreational activities in designated open space. Therefore, noise exposure levels should be considered when planning for open space use. Conversely, open space can be used as a tool to buffer noise sources from sensitive land uses through setback and landscaping. Open space designation and implementation through the Zoning Ordinance can effectively exclude the land uses from excessively noisy areas.

# TECHNICAL APPENDIX

## LIST OF APPENDICES

The following series of Maps represent estimated current and projected noise contours and current housing units within contours in various county communities:

# CHARACTERISTICS OF SOUND

1. Intensity or volume is the amount of sound pressure or energy put forth at the source and is measured in decibels (db). The decibel scale ranges from 0 to 140, with 0 corresponding to the lowest sound level that a healthy, unimpaired human ear can detect. This scale is logarithmic, thus for each increase of 10 decibels the sound increases 10 times in intensity. However, the relative loudness of sounds, as perceived by the human ear, does not closely match the actual relative amounts of sound energy. A listener will tend to judge a 10 db increase in the sound level as only twice as loud, even though it represents a 10-fold increase. The energy of a noise source varies according to the distance from source to the receiver. For roadway noise, which is described as a "line source" (i.e., a continous line of vehicles), the noise level drops 4.5 db(A) for each doubling of distance. Figure 1 in the text described various sound levels and human response.

2. Frequency or pitch, the "highness" or "lowness" of a sound, is measured in cycles per second or Hertz (Hz). Although some pure tone sounds contain only one frequency, sound usually is a mixture of different frequencies. The human ear can identify sounds with frequencies as low as 10 Hz to as high as 20,000 Hz. However, it does not hear all frequencies equally well. It is more sensitive to higher than lower frequencies. This means that people may assign different "loudness" to two sounds having identical intensities (volumes) but widely differing frequencies. To compensate for this tendency, various adaptations of the basic decibel scale have been devised to approximate the sensitivity of the ear. A-weighted scale (db(A)) is used in measuring many noise sources and is used for noise estimation levels in the noise element.

3. Duration is a measurement of sound with respect to the frequency of its occurrence. A dominant characteristic of environmental noise is that it is not steady. At any one location, the noise level usually fluctuates considerably from loud at one moment to quiet the next. Because of this, a number of methodologies for combining the noise from individual events and semi-steady state sources into measures of cumulative exposure have been developed. The Siskiyou County Noise Element uses both the Day Night Noise Level (Ldn) and the Community Noise Equivalent Level (CNEL) as basic noise descriptions. The only difference between the two measures is the additional emphasis given the hour activities. CNEL expressions are provided for airport operations while the Ldn scale is used for

estimating and projecting noise effects of other activities (traffic, railroad, and stationary sources). A summation of the three most aggregate measures of sound are described below, including the two used in this noise element (b. and c.):

a. Percentile measurement, Ln, indicates the sound level exceeded for a stated percentage of time under consideration. The percentage of time is indicated by the n value, for example $L_{10}$, where the level is exceeded 10% of the time. $L_{10}$ noise contour lines are frequently employed to describe highway noise because they are more adapted to relatively steady noise situations.

b. Community Noise Equivalent Noise Level, CNEL, is a measure of the average sound levels for a 24-hour period which is weighted to assign greater importance to sound occurring during the evening (7 p.m. to 10 p. m.) and even greater importance to sound during the night period (10 p. m. to 7 a. m.). This weighting is justified on the basis that noise during these periods is more disturbing than daytime sound. This system is especially well adapted for assessment of airport noise.

c. Day/Night Average Sound Level, Ldn, is essentially the same as CNEL except that there is only a penalty for sounds occurring during the night. This makes it somewhat easier to calculate. The Federal Environmental Protection Agency has recently recommended the Ldn be used, along with a 24-hour Leg measure, as a nationwide standard for evaluating community noises.

A fourth measure of sound is known as the Energy Mean Equivalent Noise Level, or Leq. It is essentially an average of all sounds occuring during a particular time period. Its value is that of a steady-state sound which would produce the same energy during that period and it reflects all noise fluctuations that would occur. Unfortunately, it is difficult to calculate particularly without extensive noise monitoring. Because of this and the extensive distances between communities requiring considerable time and attention, Leg values have not been calculated for Siskiyou County.

## POSSIBLE EFFECTS OF EXCESSIVE NOISE

1. Hearing Loss. Excessive noise can lead to a permanent deterioration in hearing ability which cannot be offset either through surgery or with hearing aids. Although hearing loss normally occurs only after prolonged exposure to intensive noise, more limited exposure to extremely loud sounds has been known to cause permanent damage. The U. S. Occupational Safety and Health Administration (OSHA) states the levels of

noise to which workers may be exposed and what mitigation is required if those levels are exceeded. OSHA's upper limits permit workers to be exposed to 90 decibels for eight hours. Others (American Conference of Governmental Industrial Hygienists and the Environmental Protection Agency (EPA) suggest that OSHA's limits are too high.

2. Stress Effects. Excessive noise, especially above the level of 80 or 85 db(A), triggers a remarkable number of automatic physiological changes in the body. Usually these stress reactions are only temporary, but as high noise levels become common, some of these effects may become chronic. Peptic ulcers, high blood pressure, colitis, heart disturbances, nervous disorders and tiredness are some of the psychosomatic diseases associated with noise. The change in noise levels one experiences in moving from San Francisco or Oakland to Siskiyou County is part of the reason for feeling that life in this county is more peaceful.

   Noise often interferes with many normal activities such as communication and work. Everyone has had conversation drowned out by a passing car, motorcycle or an airplane. Such interruptions can cause messages to be improperly heard and executed causing extra cost in time and labor. One particular problem area involves noise impacts on school classrooms.

3. Sleep Disturbance. Obviously noise can interfere with sleep, and lead to fatigue, but sometimes in ways of which a sleeper is unaware. A sound which is insufficient to wake someone may still impair the quality of sleep.

## NOISE CONTOUR DEVELOPMENT TECHNIQUES

CALTRANS contour development technique. Contours and noise data have been developed from sound measurements collected with two types of instruments.[1] The noise level contours represent lines of equal noise level ($\pm$ 3 db(A)) showing the general shape of the noise environment emanating from the State routes. Outside noise has been identified on the recordings and excluded from the noise contours. Generation of noise contours involves a certain amount of estimating and smoothing. The source of sound levels used in this study is exterior sound levels for through (free flowing) traffic during peak hour and peak month. For this reason, this information is totally applicable to the noise environment on an annual basis. Since traffic volumes vary on a seasonal basis in Siskiyou County, this information must be regarded as representative of maximum traffic conditions and any appraisal of the

[1] A Bruel and Kjaer M-166 sound level classifier and a General Radio 1551-C sound level meter with a 1521-B Graphic Level Recorder.

population exposure must be made with this consideration.

Traffic counts were maintained during the field test period. Trucks, particularly diesel trucks, are a chief source of motor vehicle noise. $L_{10}$ db(A) measurements and truck counts were adjusted to CALTRANS predictions for peak hour/month for the forecast years. The procedure used to estimate current and future noise effects in order to reflect peak hour and month traffic is illustrated in the following example:

50 trucks/hour counted with $L_{10}$ - 70 db(A)
100 trucks/hour predicted peak (1974)
100 trucks/hour predicted peak (1995)

$\frac{100}{2} = 2.0$ 10 log 2.0 = 3 db(A) + 70 db(A) = 73 db(A)(1974)

$\frac{158}{50} = 3.16$ 10 log 3.16= 5 db(A) = 70 db(A) + 75 db(A)(1995)

The resultant $L_{10}$ contours have been amended to approach the general requirements for day-night average noise levels (Ldn). However, they may not represent Noise Element requirements of Ldn contour expressions in terms of exposure averaged on an annual basis because the $L_{10}$ source contours reflect peak hour and peak month estimates.

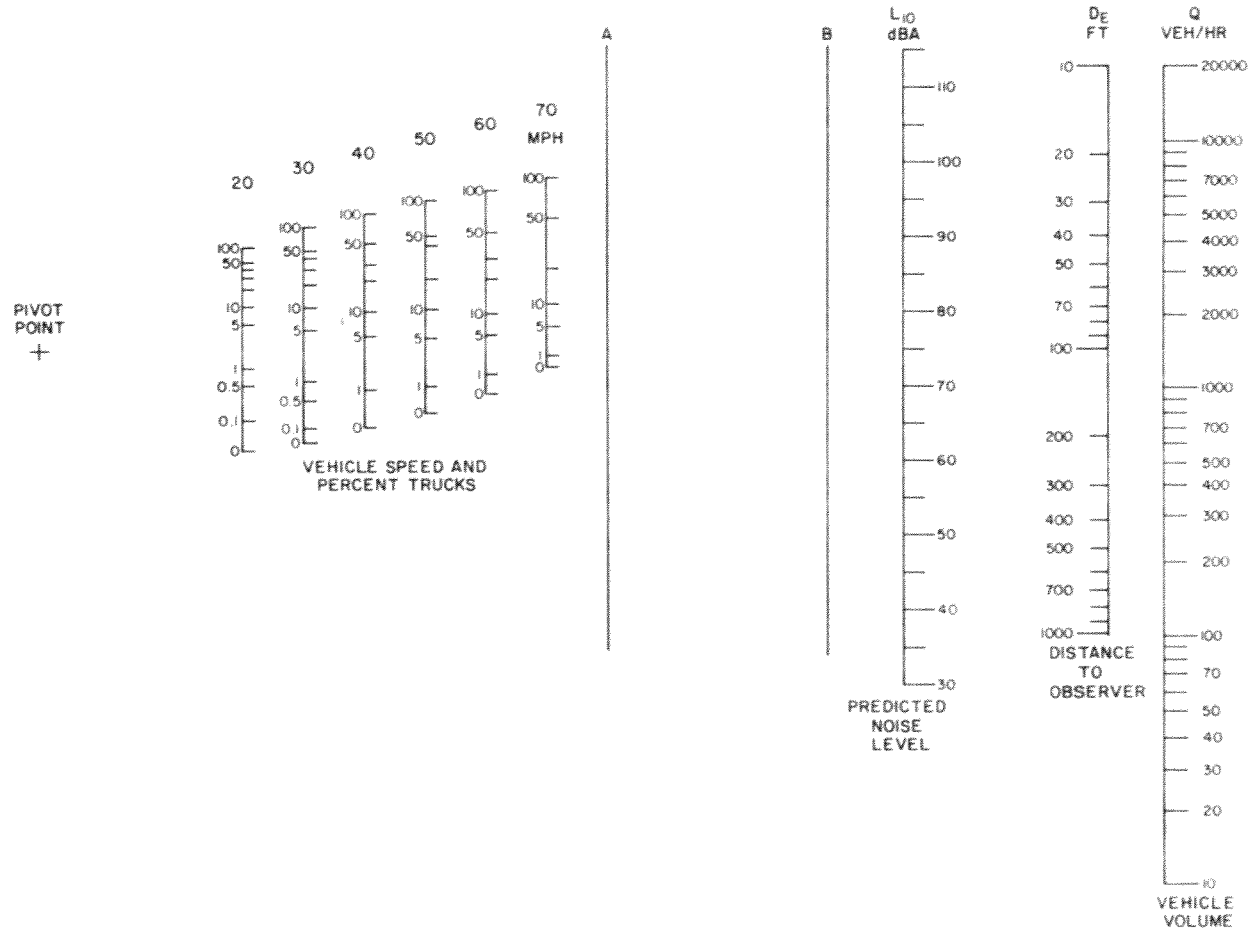
The procedure used to approximate Ldn levels is to reduce the $L_{10}$ db(A) contours by 3 db(A) with a standard table to account for noise distance reduction in order to fit 60, 65, and 70 db(A) contours where necessary.[2]

The 1995 CALTRANS projections for Siskiyou County routes were made in 1973. The district Office (Redding) finds the projections currently acceptable although traffic volumes are increasing at an accelerated pace after curtailments due to the gasoline energy shortage experienced in 1973-1974.

County contour development technique. The California Department of Transportation developed a nomograph for predicting highway noise levels in 1973. A copy of the nomograph is provided on the following page. The approach is to estimate $L_{10}$ db(A) levels on the basis of average vehicle speed, the proportion of truck traffic and the peak hour traffic volume. In applying the nomograph to the Noise Element requirement for noise level expressions

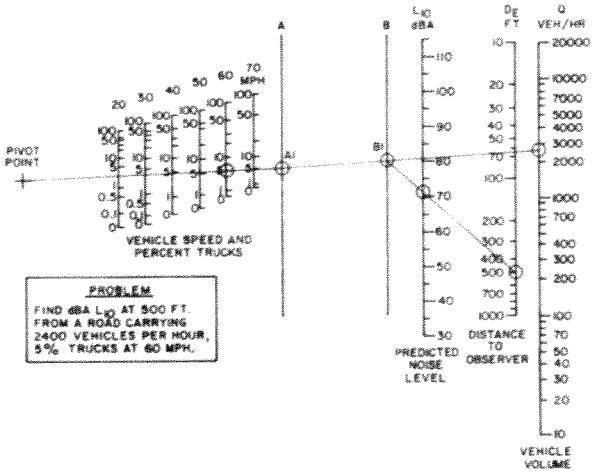
[2] Fundamentals and Abatement of Highway Traffic Noise, U.S. Department of Transportation (June 1973,) Table 1.5, Page 1-34. This table provides distance figures for desired noise reduction from a vehicular "line source" relative to 50 feet distance using a drop-off note of 4.5 db(A) per double distance.

# NOMOGRAPH FOR APPROXIMATE PREDICTION OF HIGHWAY NOISE LEVELS

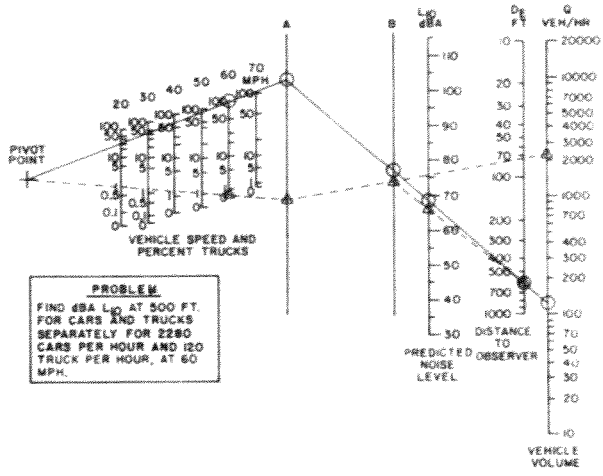



# NOMOGRAPH SAMPLE PROBLEMS

## PROBLEM I: Cars & Trucks Together




## PROBLEM II: Cars & Trucks Separately




Source: CALTRANS, Jan. | 1973

in Ldn levels, it was necessary to adjust the $L_{10}$ calibrated db(A) scale upward by 3 decibels. This approximates a generally accepted 3 db(A) increase in $L_{10}$ values over Ldn values.[3] The adjustment essentially increases the $L_{10}$ value from 60 to 63 db(A) as the equivalent to 60 db(A) Ldn.

Average Daily Traffic ADT volumes provided the basis for noise estimation.[4] The peak hour volume is assumed as 10% of the ADT. Average vehicle speed and the percentage of truck traffic were estimated.

Railroad Noise Contour Estimating Technique. The procedure used for estimating noise impacts associated with rail operations has been developed from a procedure provided by the State of California, Office of Noise Control.[5] This method presents a simplified nomogram technique based on analytical procedures and computer augmented techniques. It accounts for the noise magnitude of individual occurrences, the total number of single events during a 24-hour day and the increased sensitivity to night time operations. (10 p.m. to 7 a.m.). The technique is consistent with the Noise Element Requirements for an expression of Day-Night Average Level (Ldn) noise estimation on an annual basis.

Noise contours for equivalent number of on-line operations are expressed in the formula:

$$N = N_d + 10\ N_n$$

where: $N$ = equivalent number of operations
$N_d$ = number of daytime operations occurring between 7 a.m. and 10 p.m.
$N_n$ = number of nightime operations occurring between 10 p.m. and 7 a.m.

[3] This application, however, is more reliable with high volume traffic facilities where a steady state noise condition may exist. While the nomograph technique is less appropriate to lower volume conditions, it represents the only available predictive means outside of extensive and extended noise monitoring. The California Office of Noise Control (Berkeley) is preparing a program/procedure requiring computer application to more precisely estimate noise effects under a variety of road and environmental conditions.

[4] Siskiyou County Public Works Department traffic counts taken primarily during summer months (peak traffic) in 1973, 1975, and 1977. It is cautioned that the figures used represent one day counts only and may be unrepresentative of average daily conditions.

[5] "Simplified Procedure for Developing Railroad Noise Exposure Contours", by Jack W. Swing, State of California, Office of Noise Control, Berkeley, (as reprinted from Sound and Vibration, February 1975)

A nomogram has been provided by the State Office of Noise Control relating the equivalent number of on-line operations to the desired noise level to determine its distance from the railroad tracks.

Adjustments may be made to the Ldn Noise Contours in order to account for the presence of helper engines on ascending grades, low speed classified track, switching frogs, bridgework and tight radius curves which each add to the noise effect. However, in the event of multiple occurrences, only the larger of the adjustment values may be considered. Since virtually all tracks in Siskiyou County are low speed classified track the +4 correction value has been added.

Noise contours have been estimated for 70, 65 and 60 db(A) (Ldn) values for areas involving the proximity of dwelling units. These include the urban community of McCloud, the urban fringes of Dunsmuir, and Mt. Shasta City and the communities of Gazelle, Grenada, Hornbrook, Macdoel and Mt. Hebron.

The following table (A-1) provides various noise effect distances for several railroad segments in Siskiyou County on the basis of current operations applied to the nomogram procedure.

TABLE A-1: ESTIMATED DISTANCES (IN FEET) FOR RAILROAD NOISE CONTOURS, SISKIYOU COUNTY, 1978.

| | Decibels (db(A)) in Ldn | | | |
|---|---|---|---|---|
| Railroad and Segment | 75 | 70 | 65 | 60 |
| Southern Pacific | | | | |
| Shasta County - Weed | | 340 | 625 | 1,140 |
| Weed - Oregon via Macdoel | 190 | 370 | 640 | 1,250 |
| Weed - Montague | | 125 | 270 | 475 |
| Montague - Oregon | | | 170 | 320 |
| McCloud River | | | | |
| McCloud - Mt. Shasta City | | 125 | 270 | 480 |
| McCloud | | 170 | 335 | 600 |

Airport Noise Contour Estimating Technique. Initial data required in estimating noise contours around airports include:

1. The annual average number of daily takeoffs and landings between the hours of 7 a.m. and 7 p.m., between 7 p.m. and 10 p.m., and 10 p.m. and 7 a.m. for propeller and jet aircraft for each flight track.

2. The determination of weighted operations by the number of operations by each type of aircraft (e.g., horsepower rating of propeller aircraft). A CNEL contour worksheet facilitates the development of weighted flights on the basis of activities, engine size and hours of operation. Evening operations are multiplied by three, while night time activities are weighted by a factor of 10.

3. The weighted totals of both propeller and jet operations are referred to a standard graph to determine appropriate curve closures for both takeoff and landing contours. Non-jet operations are referred to a table indicating appropriate takeoff and landing closure distances for contour development. The closure distances for airports with jet operations (only the County Airport north of Montague and projections for the Weed Airport), are determined from the takeoff and landing graphs relative to the percentage of daily jet flights.

4. Appropriate contour sets are provided for non-jet activities and for several percentages of jet use distribution for both takeoffs and landings. A base map at the same scale as the contours, showing the runway(s) is placed over the contour set. Takeoff contours are aligned on the end of the runway and the appropriate contour closures are traced. This is repeated at both ends of the runway and individually for each runway. Landing contours are normally traced in at the most common touch down point, usually one-fourth to one-sixth the distance from the end of the approach runway depending on the length of the runway (i.e., shorter runways equal shorter touchdown points). In some instances, as noted in the text description of the particular airport, the touchdown point has been moved to the end of the approach runway.

5. Future activities have been projected on the basis of discussions with airport officials and reference to the Siskiyou County Transportation Plan (1975). Projected contours are shown in dashed lines on each map. Projections are made to the 1990-1995 period.

One point of caution should be made. The developed contours are supplied on the basis of average daily operations throughout the year. As appoximations, they should not be used to precisely define zoning and local noise ordinance preparation and implementation. The contours may be used to satisfy compliance with State Noise Insulation Standards; however, monitoring may be advisable to more precisely determine the extent of the 60 db(A) contours and the relationship to maximum rather than average daily operations.

The Noise Contour Maps have been prepared at a scale of one inch representing 2,000 feet. While no housing units have been identified within the 65 db(A) (CNEL) contour, those close to them are indicated as possible units within the 60 db(A) (CNEL) contour.

TABLE A-2

SUGGESTED INTERIOR NOISE LEVELS (Ldn)

CONSIDERED COMPATIBLE FOR VARIOUS USES

| USE | Ldn | BASIS FOR CRITERIA |
|---|---|---|
| RESIDENTIAL | 45 | Undisturbed Sleep and State Law (Cal Admin. Code, Title 25, Ch. 1, Subch. 1, Art. 4, Sect. 1092) |
| COMMERCIAL | | |
| Hotel-Motel | 45 | Undisturbed Sleep and State Law (Cal Admin. Code, Title 25, Ch. 1, Subch. 1, Art. 4, Sect. 1092) |
| Executive Offices, Conference Rooms | 55 | Speech communication - 3.5 meters - normal voice |
| Staff Offices | 60 | Speech communication - 2 meters - normal voice |
| Restaurant, Markets, Retail Stores | 60 | Speech communication - 2 meters - normal voice |
| Sales, Secretarial | 65 | Speech communication - 1 meter - normal voice |
| Sports Arena, Bowling Alley, etc. | 70 | Speech communication - 0.7 meters or 2.25 feet-raised voice |
| INDUSTRIAL | | |
| Offices (same as above) | 55-60 | |
| Laboratory | 60 | Speech communication - 2 meters - normal voice |
| Machine Shop, Assembly, & Others | 70 | Speech communication - 0.7 meters - raised voice |
| PUBLIC OR SEMI-PUBLIC FACILITY | | |
| Concert Hall & Legitimate Theater | 30 | Intrusion of noise may spoil artistic effect |
| Auditorium, Movie Theater & Church | 45 | Minimize intrusion into artistic performance and speech communication - 20 meters - raised voice |
| Hospital, Nursing Home & Firehouse (sleeping quarters | 45 | Undisturbed Sleep |
| School Classroom | 50 | Speech communication - 6 meters - normal voice & State law (Cal. Streets & Highways Code, Sect. 216) |
| Library | 50 | Minimize interruption of reading |
| Other | 55 | Speech communication - 3.5 meters - normal voice |

Source: Draft Noise Element, Santa Cruz County, California (August, 1977), page 18.

TABLE A-3

CALIFORNIA NOISE STANDARDS

FOR NEW MOTOR VEHICLES

| CLASS | CALIFORNIA |
|---|---|
| Motorcycles | |
| Until 1/1/73 | 88 db(A) |
| Mfd after 1/1/73 | 86 db(A) |
| Mfd after 1/1/75 | 80 db(A) |
| Mfd after 1/1/77 | 75 db(A) |
| Mfd after 1/1/87 | 70 db(A) |
| Light Vehicles | |
| Until 1/1/73 | 86 db(A) |
| Mfd after 1/1/73 | 84 db(A) |
| Mfd after 1/1/75 | 80 db(A) |
| Mfd after 1/1/77 | 75 db(A) |
| Mfd after 1/1/87 | 70 db(A) |
| Heavy Vehicles | (6000 lbs.+) |
| Until 1/1/73 | 88 db(A) |
| Mfd after 1/1/73 | 86 db(A) |
| Mfd after 1/1/75 | 83 db(A) |
| Mfd after 1/1/77 | 80 db(A) |
| Mfd after 1/1/87 | 70 db(A) |

Source: Draft Noise Element, Santa Cruz County, CA. (August, 1977), page 23.

TABLE A-4

CALIFORNIA STATE NOISE EMISSION STANDARDS

FOR MOTORBOATS (AT 50 FEET FROM THE MOTORBOAT)

| MOTORBOAT ENGINE MANUFACTURED | MAXIMUM NOISE LEVEL |
|---|---|
| After January 1, 1974 and before January 1, 1976 | 86 db(A) |
| On or after January 1, 1976 and before January 1, 1978 | 84 db(A) |
| On or after January 1, 1978 | 82 db(A) |

Source: California Motorboat Regulations, Harbors and Navigation Code, Sections 654, 654.05, 654.06 and 668.

Table A-5

SUGGESTED PEAK NOISE LEVELS FROM CONSTRUCTION EQUIPMENT

| Equipment Type | Peak Noise Level in db(A) at 100 feet |
|---|---|
| Earthmoving | |
| front loaders | 75 |
| backhoes | 75 |
| dozers | 75 |
| tractors | 75 |
| scrapers | 80 |
| graders | 75 |
| trucks | 75 |
| pavers | 80 |
| Materials Handling | |
| concrete mixers | 75 |
| concrete pumps | 75 |
| cranes | 75 |
| derricks | 75 |
| Stationary | |
| pumps | 75 |
| generators | 75 |
| compressors | 75 |
| Impact | |
| pile drivers | 95 |
| jackhammers | 75 |
| rock drills | 80 |
| pneumatic tools | 80 |
| Other | |
| saws | 75 |
| vibrators | 75 |

Source: Solano County Noise Element. These criteria are relatively lenient since such activities are temporary and difficult to avoid.

TABLE A-6

SUMMARY OF NOISE LEVELS IDENTIFIED

AS REQUISITE TO PROTECT PUBLIC HEALTH AND WELFARE

WITH AN ADEQUATE MARGIN OF SAFETY

| EFFECT | LEVEL | | AREA |
|---|---|---|---|
| Hearing Loss | Leq(24)<br>Ldn | 70 db(A)<br>76 db(A) | All areas |
| Outdoor activity | Ldn | 55 db(A) | Outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use. |
| | Leq (24) | 55 db(A) | Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc. |
| Indoor activity interference and annoyance | Ldn | 45 db(A) | Indoor residential areas |
| | Leq (24) | 45 db(A) | Other indoor areas with human activities such as schools, etc. |

Notes: Leq(24) represents the sound energy averaged over a 24-hour period while Ldn represents the Leq with a 10 dB nighttime weighting.

The hearing loss level identified here represents annual averages of the daily level over a period of forty years. (These are energy averages, not to be confused with arithmetic averages).

Source: Noise Element, Richmond General Plan, Richmond, California (October, 1975), Table 2.

TABLE A-7

CALIFORNIA STATE NOISE EMISSION STANDARDS

FOR MOTOR VEHICLES

(AT 50 FEET FROM CENTER LANE OF TRAVEL)

| VEHICLE TYPE | 35 MPH | 35MPH |
|---|---|---|
| Trucks* | 88 db(A) | 90 db(A) |
| Motorcycles | 82 | 86 |
| Automobiles | 76 | 82 |

*For trucks manufactured after 1973, and operating at 35 mph or less, the maximum level allowed for is 86 db(A).

Notes: Trucks are defined as "Any motor vehicle with a manufacturer's gross vehicle weight of 6000 lbs or more, and any combination of vehicles towed by such motor vehicles."

Motorcycles are defined as "Any two-wheeled, motor-driven vehicle other than a motor-driven cycle."

Automobiles are defined as "Any other motor vehicle and any combination of vehicles towed by such motor vehicle."

Source: Draft Noise Element, Santa Cruz County, CA. (August, 1977), page 22.

TABLE A-8: ESTIMATED[1] CURRENT (1975-1977) TRAFFIC NOISE CONTOUR DISTANCES AND HOUSING UNITS WITHIN VARIOUS NOISE LEVELS, UNINCORPORATED SISKIYOU COUNTY URBAN ROADS & STREETS.

| | HAPPY CAMP LOCATION[2] | ADT[2] | 10% PEAK TRAFFIC | EST. AVG. VEH SPEED | % TRUCKS | NOISE CONTOUR DISTANCES/HOUSING UNITS AFFECTED 60 db(A) | H.U.[3] | 65 db(A) | H.U.[3] | 70 db(A) | H.U.[3] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | INDIAN CREEK ROAD | | | | | | | | | | |
| 1 | N. of Davis St. | 1423 | 142 | 20-30 | 15 | 1000+ | | 460 | | 160 | |
| 2 | S. of Davis St. | 595 | 60 | 20 | 5 | 210 ) | 28-5 | 60 ) | 22-3 | 19 | |
| 3 | at 4th Ave. | 760 | 76 | 20 | 5 | 260 ) | | 75 ) | | 24 | |
| | DAVIS ROAD | | | | | | | | | | |
| 4 | E. of Crumpton St. | 680 | 68 | 20 | 15 | 790 | 3-20 | 250 | 2-20 | 76 | 0-9 |
| | DOOLITTLE STREET | | | | | | | | | | |
| 5 | W. of Highway 96 | 510 | 51 | 20 | 2 | 53 | 4-2 | 16 | 1-0 | - | |
| | REEVES STREET | | | | | | | | | | |
| 6 | W. of Highway 96 | 248 | 25 | 20 | 2 | 25 | 1-2 | - | | - | |
| | 4th AVENUE | | | | | | | | | | |
| 7 | E. of Indian Creek Rd. | 564 | 56 | 20 | 0.5 | 19 | 1-0 | - | | - | |
| | WASHINGTON STREET | | | | | | | | | | |
| 8 | N. of 2nd Ave. | 803 | 80 | 20 | 0.5 | 25 | 1-0 | - | | - | |
| | 2nd AVENUE | | | | | | | | | | |
| 9 | At Nuggett Street | 227 | 23 | 25 | 5 | 62 | 4-3 | 19 | 0-2 | - | |
| | AIRPORT ROAD | | | | | | | | | | |
| 10 | N. of 2nd Ave. | 237 | 24 | 20 | 0.5 | 10 | | - | | - | |
| | BUCKHORN ROAD | | | | | | | | | | |
| 11 | N. of 2nd Ave | 423 | 42 | 25 | 0.5 | 16 | 1-1 | - | | - | |
| | Total Housing Units Within Various Noise db(A) Levels. | | | | | (60+) | 43-33 | (65+) | 25-25 | (70+ | 0-9 |
| | SOUTH YREKA | | | | | | | | | | |
| | FAIRLANE ROAD | | | | | | | | | | |
| 1 | at S. City Limits | 3061 | 306 | 30 | 1 | 170 ) | 9-7 | 48 ) | 2-1 | 15 | |
| 2 | N. of Walters Lane | 1805 | 181 | 20 | 0.5 | 62 ) | (1-0) | 20 ) | (0-0) | - | |

[1] CALTRANS nomograph (1973) used for traffic noise estimation described and shown on pages 4 and 5.
[2] See Maps 1, 3, 4, 8, 10 & 11 in Appendix for average daily traffic (ADT) count locations.
[3] Housing units expressed in permanent structures and mobilehomes (e.g. 23-5=23 perm. units, 5 mobiles). Figures in parenthesis indicate actual additional units within adverse noise contours. (See page 14 of text for further explanation).

SOURCES: County of Siskiyou Public Works Department ADT figures and road system mapping; TerraScan (1978) and Siskiyou County General Plan Land Use information (1968) for housing units affected.

TABLE A-8: (Cont'd.)

| | SOUTH YREKA (Cont'd.) LOCATION[2] | ADT[2] | 10% PEAK TRAFFIC | EST. AVG. VEH SPEED | % TRUCKS | NOISE CONTOUR 60 db(A) | H.U.[3] | DISTANCES/HOUSING UNITS AFFECTED 65 db(A) | H.U.[3] | 70 db(A) | H.U.[3] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | WALTERS LANE | | | | | | | | | | |
| 3 | I-5 Overpass | 1556 | 156 | 20 | 0.5 | 50 | 0-2 | 18 | | - | |
| | EASY STREET | | | | | | | | | | |
| 4 | S. of Walters Lane | 1532 | 153 | 20 | 0.5 | 50 | | 18 | | - | |
| 5 | E. of Pruett Drive | 537 | 54 | 30 | 1 | 26 | | - | | - | |
| | Total housing units within various noise db(A) levels | | | | | (60+) | 9-9 (1-0) | (65+) | 2-1 (0-0) | (70+) | 0-0 |
| | MT. SHASTA CITY AREA | | | | | | | | | | |
| | OLD STAGE ROAD | | | | | | | | | | |
| 1 | N. of West Jessie St. | 1123 | 112 | 25 | 5 | 300 | 15-0 | 84 | 5-0 | 26 | |
| 2 | N. of Lassen Lane | 1304 | 130 | 25 | 5 | 320 ) | | 86 ) | | 29 | |
| 3 | N. of Rainbow Dr. | 1200 | 120 | 30 | 5 | 300 ) | 23-0 | 85 ) | 8-0 | 28 | |
| 4 | S. of Davis Place | 880 | 88 | 25 | 5 | 225 | | 60 | | 20 | |
| 5 | S. of W.A.Barr Rd. | 1007 | 101 | 25 | 5 | 255 | 10-0 | 66 | 7-0 | 22 | |
| 6 | 0.3 mi. S. Ream Rd. | 257 | 26 | 30 | 5 | 48 | 2-0 (0-0) | 16 | | | |
| | W.A. BARR ROAD | | | | | | | | | | |
| 7 | S. of Old Stage Rd. | 954 | 95 | 25 | 5 | 220 | 2-0 | 60 | | 20 | |
| 8 | 0.3 mi. S. North Shore | 1485 | 149 | 30 | 5 | 300 | | 80 | | 28 | |
| | LASSEN LANE | | | | | | | | | | |
| 9 | 0.2 mi. E. Old Stage Rd. | 842 | 84 | 30 | 5 | 175 | 7-0 | 50 | 1-0 | 16 | |
| | SOUTH MT. SHASTA BLVD. | | | | | | | | | | |
| 10 | At City Limits | 3487 | 349 | 30 | 10 | 1000+) | 9-0 | 400 ) | 5-0 | 140 ) | 4-0 |
| 11 | S. of I-5/89 | 905 | 91 | 20 | 10 | 500 ) | (3-0) | 175 ) | (1-0) | 50 ) | (0-0) |
| | NORTH MT. SHASTA BLVD. | | | | | | | | | | |
| 12 | 0.3 mi. N. City Limits | 2954 | 295 | 30 | 10 | 1000 ) | 40-0 | 350 ) | 17-0 | 120 ) | 6-0 |
| 13 | E. of I-5 | 2722 | 272 | 25 | 10 | 900 ) | (0-0) | 250 ) | (0-0) | 75 ) | (0-0) |
| | PINE GROVE DRIVE | | | | | | | | | | |
| 14 | N. of Lassen Lane | 719 | 72 | 30 | 5 | 70 | 12-0 | 25 | | | |
| | REAM ROAD | | | | | | | | | | |
| 15 | E. of W.A. Barr Road | 480 | 48 | 30 | 5 | 130 | 5-0 (0-0) | 34 | | | |
| | Total housing units within various noise db(A) levels | | | | | (60+) | 120-0 (72-0) | (65+) | 43-0 (24-0) | (70+) | 10-0 (0-0) |

TABLE A-8: (Cont'd.)

| McCLOUD LOCATION[2] | ADT[2] | 10% Peak TRAFFIC | EST. AVG. VEH SPEED | % TRUCKS | NOISE CONTOUR 60 db(A) | H.U.[3] | DISTANCES/HOUSING UNITS AFFECTED 65 db(A) | H.U.[3] | 70 db(A) | H.U.[3] |
|---|---|---|---|---|---|---|---|---|---|---|
| BROADWAY | | | | | | | | | | |
| No count available, assume 1500 min | | 150 | 20 | 2 | 160 | 34-0 | 45 | 34-0 | 15 | |
| EAST/WEST MINNESOTA AVENUES | | | | | | | | | | |
| 1 at Broadway | 2712 | 271 | 20 | 5 | 900 | 27-0 | 260 | 17-0 | 78 | 7-0 |
| 2 Near Main St. | 1946 | 195 | 20 | 5 | 600 | 14-0 | 180 | 10-0 | 54 | 3-0 |
| | | | | | | (7-0) | | (5-0) | | (1-0) |
| 3 E. of #89 | 462 | 46 | 20 | 2 | 50 | | 15 | | - | |
| 4 Near Shasta | 569 | 57 | 20 | 2 | 55 | 33-0 | 19 | | - | |
| EAST/WEST COLOMBERO AVENUES | | | | | | | | | | |
| 5 E. of #89 | 509 | 51 | 20 | 2 | 50 | | 15 | | - | |
| 6 At Main St. | 1833 | 183 | 20 | 3 | 310 ) | 24-1 | 90 ) | 12-1 | 30 | |
| 7 W. of Broadway | 1287 | 129 | 20 | 3 | 205 ) | (13-0) | 60 ) | (6-0) | 19 | |
| 8 W. of Shasta | 1310 | 131 | 20 | 2 | 125 | 5-1 | 35 | | - | |
| MAIN STREET | | | | | | | | | | |
| 9 S. of Colombero Ave. | 1803 | 180 | 20 | 2 | 165 | 6-0 | 55 | 6-0 | 19 | |
| | | | | | | (1-0) | | (1-0) | | |
| Total housing units within various voise db(A) levels | | | | | (60+) | 143-2 | (65+) | 79-1 | (70+) | 10-0 |
| | | | | | | (125-1) | | (63-0) | | (8-0) |
| GRENADA | | | | | | | | | | |
| HIGHWAY A-12 | | | | | | | | | | |
| 1 W. of Montague/Grenada | 1373 | 137 | 30 | 20 | 940 ) | 25-9 | 300 ) | 11-1 | 95 ) | 9-0 |
| 2 E. of Montague/Grenada Rd. | 1111 | 111 | 30 | 20 | 900 ) | (19-0) | 260 ) | (8-0) | 80 ) | (8-0) |
| MONTAGUE ROAD | | | | | | | | | | |
| 3 S. of 2nd St. | 682 | 68 | 20 | 3 | 130 | 34-6 | 35 | 6-2 | 12 | |
| OLD HIGHWAY 99 | | | | | | (3-0) | | (0-0) | | |
| 4 W. of I-5 | 755 | 76 | 30 | 5 | 150 | 6-1 | 40 | | - | |
| MONTAGUE-GRENADA ROAD | | | | | | | | | | |
| 5 N. of A-12 | 774 | 77 | 20 | 7 | 290 | | 90 | | 25 | |
| Total housing units within various noise db(A) levels | | | | | (60+) | 65-16 | (65+) | 17-3 | (70+) | 9-0 |
| | | | | | | (28-1) | | (8-0) | | (8-0) |
| HORNBROOK | | | | | | | | | | |
| HENLEY-HORNBROOK ROAD | | | | | | | | | | |
| 1 E. of Oregon Rd. | 717 | 72 | 20 | 1 | 44 ) | 14-0 | 15 | | - | |
| 2 W. of Front St. | 776 | 77 | 20 | 1 | 48 ) | | 16 | | - | |
| HORNBROOK ROAD | | | | | | | | | | |
| 3 N. of Oregon | 629 | 63 | 30 | 1 | 32 | 3-0 | 12 | | - | |
| OREGON ROAD | | | | | | | | | | |
| 4 S. of Main St. | 791 | 79 | 25 | 1 | 50 | | 15 | | - | |
| 5 N. of Main St. | 559 | 56 | 25 | 1 | 35 | | 12 | | - | |

TABLE A-8: (Cont'd)

| HORNBROOK (Cont'd) LOCATION | ADT[2] | 10% PEAK TRAFFIC | EST. AVG. VEH SPEED | % TRUCKS | NOISE CONTOUR 60 db(A) | H.U.[3] | DISTANCES/HOUSING UNITS AFFECTED 65 db(A) | H.U.[3] | 70 db(A) | H.U.[3] |
|---|---|---|---|---|---|---|---|---|---|---|
| FRONT STREET/FIRST AVENUE | | | | | | | | | | |
| 6 E. of Henley-Hornbrook Rd. | 796 | 80 | 20 | 0.5 | 30 | 5-0 | - | | - | |
| 7 N. of First St. | 490 | 49 | 20 | 0.5 | 20 | 2-0 | - | | - | |
| | | | | | (60+) | 24-0 | (65+) | | (70+) | |

Total housing units within various noise db(A) levels

TABLE A-9: (Cont'd.)

| McCLOUD LOCATION[2] | GROWTH 1977-90 | EST ADT | 10% PEAK TRAFFIC | EST. AVG. VEH SPEED | % TRUCKS | NOISE CONTOUR DISTANCES/HOUSING UNITS AFFECTED 60 db(A) | H.U.[3] | 65 db(A) | H.U.[3] | 70 db(A) | H.U.[3] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BROADWAY | | | | | | | | | | | |
| No current ADT Data Available, Assume | | 1500 | 150 | 20 | 20 | 160 | 34-0 | 45 | 34-0 | 15 | |
| EAST/WEST MINNESOTA AVE'S | | | | | | | | | | | |
| 1 | 5% | 2848 | 285 | 20 | 5 | 850 | 27-0 | 260 | 17-0 | 75 | 7-0 |
| 2 | 5% | 2043 | 204 | 20 | 5 | 700 | 14-0 (7-0) | 200 | 10-0 (5-0) | 65 | 3-0 (1-0) |
| 3 | 5% | 485 | 49 | 20 | 2 | 55 | | 19 | | - | |
| 4 | 5% | 597 | 60 | 20 | 2 | 55 | 33-0 | 19 | | - | |
| EAST/WEST COLOMBERO AVE'S | | | | | | | | | | | |
| 5 | 10% | 560 | 56 | 20 | 2 | 54 | | 18 | | - | |
| 6 | 10% | 2016 | 202 | 20 | 3 | 320 ) | 24-1 | 93 | 13-1 | 22 | |
| 7 | 10% | 1416 | 142 | 20 | 3 | 210 ) | (13-0) | 65 | (6-0) | - | |
| 8 | 10% | 1441 | 144 | 20 | 2 | 130 | 5-1 | 37 | | - | |
| MAIN STREET | | | | | | | | | | | |
| 9 | 12% | 2019 | 202 | 20 | 2 | 190 | 6-0 (1-0) | 58 | 6-0 (1-0) | 19 | |
| Total housing units within various projected noise levels | | | | | | (60 db(A)) | 143-2 (125-1) | (65 db(A)) | 79-1 (63-0) | (70 db(A)) | 44-0 (42-0) |
| GRENADA | | | | | | | | | | | |
| HIGHWAY A-12 | | | | | | | | | | | |
| 1 | 50% | 2060 | 206 | 30 | 15 | 1000+) | 31-9 | 480 | 21-1 | 160 | 9-0 |
| 2 | 50% | 1667 | 167 | 30 | 15 | 1000 ) | (23-0) | 350 | (10-0) | 125 | (8-0) |
| MONTAGUE ROAD | | | | | | | | | | | |
| 3 | 25% | 853 | 85 | 20 | 3 | 155 | 35-6 (4-0) | 45 | 10-2 (0-0) | 16 | |
| OLD HIGHWAY 99 | | | | | | | | | | | |
| 4 | 15% | 868 | 87 | 30 | 5 | 170 | 6-1 | 50 | 1-0 | 17 | |
| MONTAGUE-GRENADA | | | | | | | | | | | |
| 5 | 30% | 1006 | 101 | 20 | 5 | 320 | | 100 | | 30 | |
| Total housing units within various projected noise levels | | | | | | (60 db(A)) | 72-16 (33-1) | (65 db(A)) | 32-3 (11-0) | (70 db(A)) | 9-0 (8-0) |

TABLE A-9: (Cont'd)

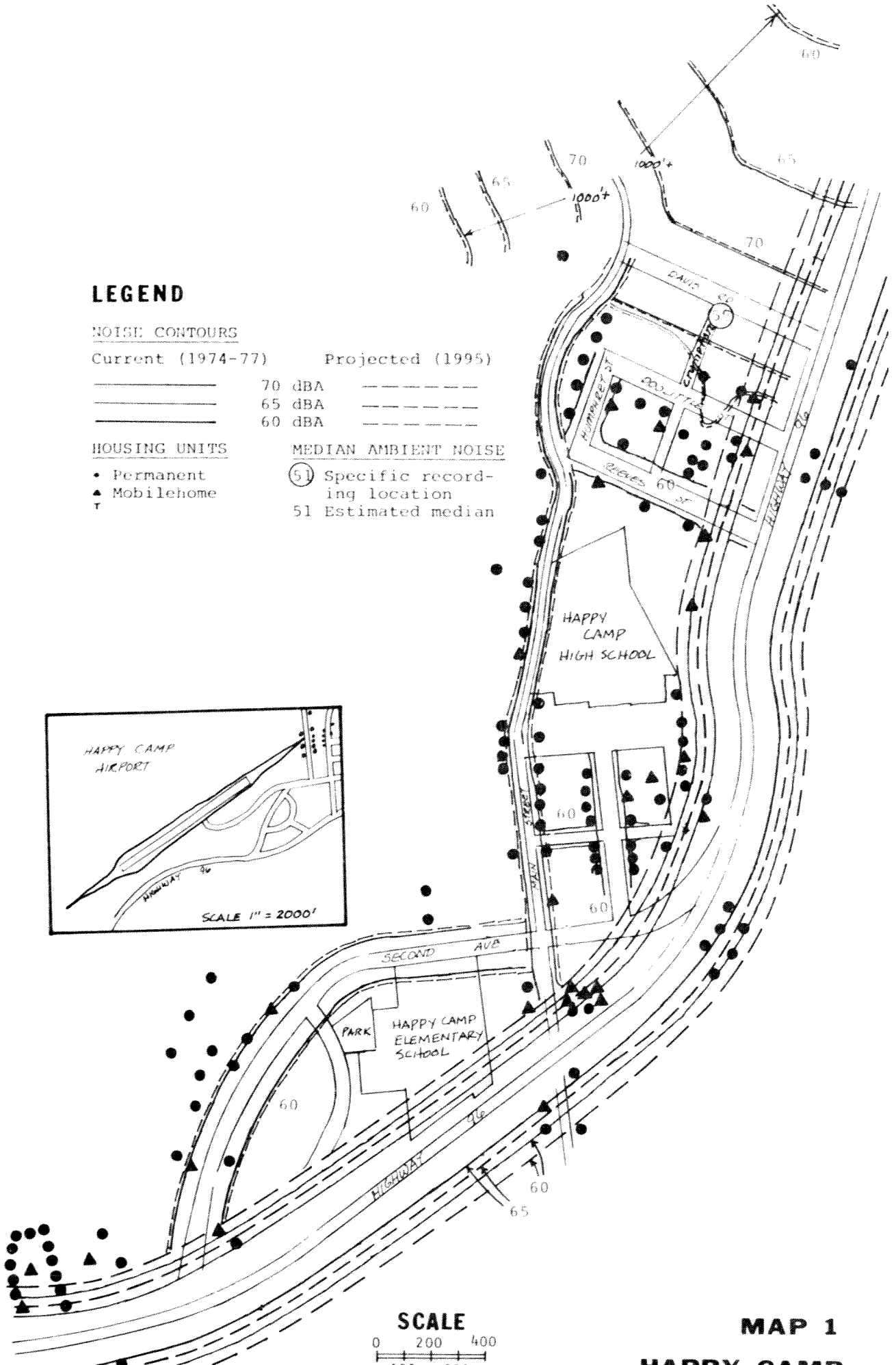
| HORNBROOK LOCATION[2] | GROWTH 1977-90 | EST ADT | 10% PEAK TRAFFIC | EST. AVG. VEH SPEED | % TRUCKS | NOISE CONTOUR DISTANCES/HOUSING UNITS AFFECTED 60 db(A) | H.U.[3] | 65 db(A) | H.U.[3] | 70 db(A) | H.U.[3] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HENLEY-HORNBROOK RD. | | | | | | | | | | | |
| 1 | 60% | 1147 | 115 | 20 | 1 | 70 ) | 17-0 | 22 ) | 2-0 | - | |
| 2 | 50% | 1164 | 117 | 20 | 1 | 70 ) | | 22 | | - | |
| HORNBROOK RD. | | | | | | | | | | | |
| 3 | 60% | 1006 | 101 | 30 | 1 | 46 | 5-0 | 16 | | - | |
| OREGON RD. | | | | | | | | | | | |
| 4 | 80% | 1424 | 142 | 25 | 1 | 70 ) | | 22 | | - | |
| 5 | 65% | 922 | 92 | 25 | 1 | 52 ) | 1-0 | 15 | | - | |
| FRONT ST/FIRST AVE | | | | | | | | | | | |
| 6 | 60% | 1274 | 127 | 20 | 0.5 | 40 | 12-0 | 14 | | - | |
| 7 | 45% | 710 | 71 | 20 | 0.5 | 23 | 2-0 | - | | - | |
| Total housing units within various projected noise levels | | | | | | (60 db(A)) | 37-0 | (65 db(A)) | 2-0 | | |

TABLE A-10: CORRECTIONS TO BE ADDED TO THE MEASURED COMMUNITY NOISE EQUIVALENT LEVEL (CNEL) TO OBTAIN NORMALIZED CNEL

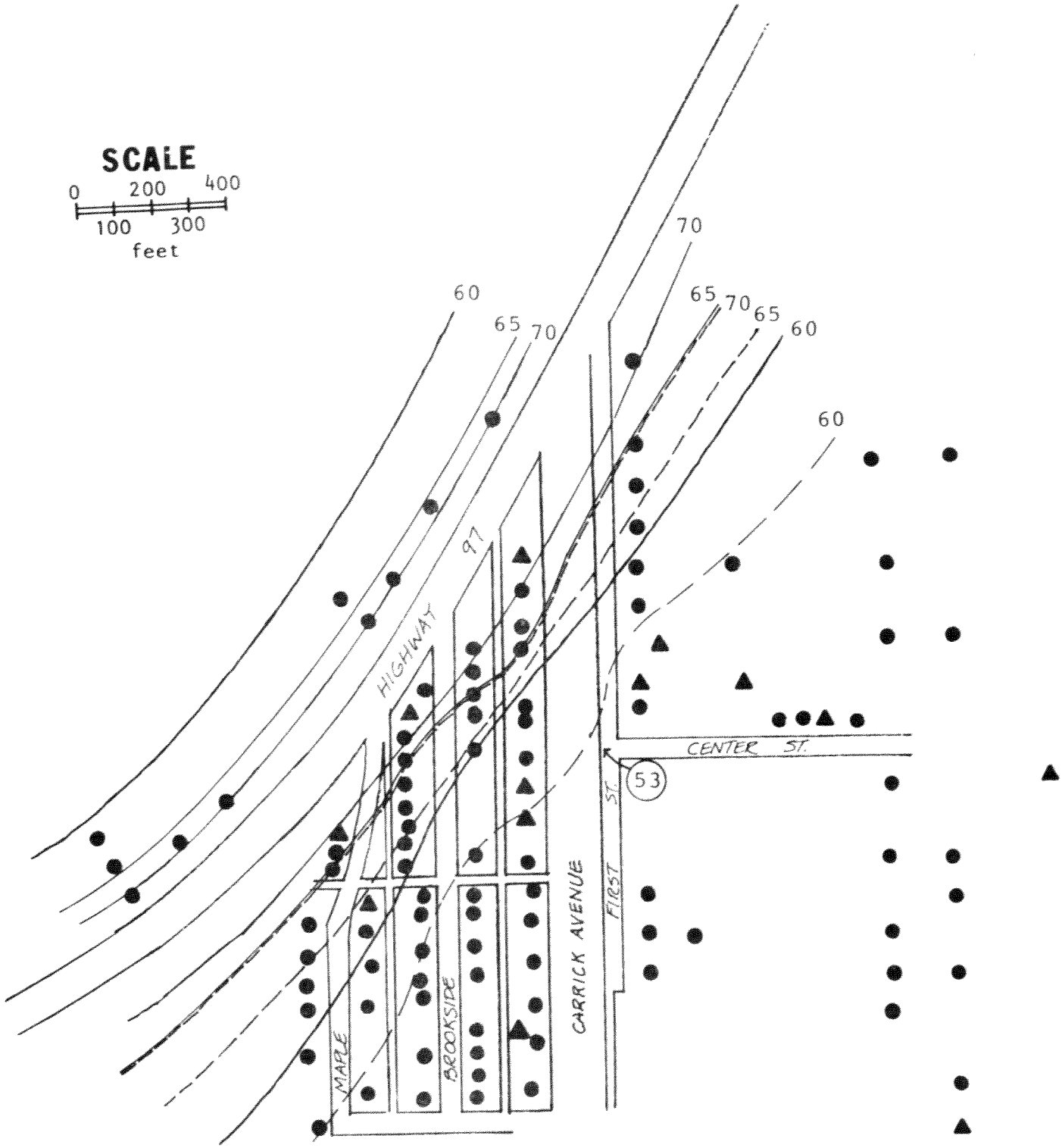
| Type of Correction | Description | Amount of Correction to be Added to Measured CNEL in dB |
|---|---|---|
| Seasonal Correction | Summer (or year-round operation). | 0 |
| | Winter only (or windows always closed). | - 5 |
| Correction for Outdoor Residual Noise Level | Quiet suburban or rural community (remote from large cities and from industrial activity and trucking). | +10 |
| | Quiet suburban or rural community (not located near industrial activity). | + 5 |
| | Urban residential community (not immediately adjacent to heavily traveled roads and industrial areas). | 0 |
| | Noisy urban residential community (near relatively busy roads or industrial areas). | - 5 |
| | Very noisy urban residential community. | -10 |
| Correction for Previous Exposure and Community Attitudes | No prior experience with the intruding noise. | +5 |
| | Community has had some previous exposure to intruding noise but little effort is being made to control the noise. This correction may also be applied in a situation where the community has not been exposed to the noise previously, but the people are aware that bona fide efforts are being made to control the noise. | 0 |
| | Community has had considerable previous exposure to the intruding noise and the noise maker's relations with the community are good | - 5 |
| | Community aware that operation causing noise is very necessary and it will not continue indefinitely. This correction can be applied for an operation of limited duration and under emergency circumstances. | -10 |
| Pure Tone of Impulse | No pure tone or impulsive character | 0 |
| | Pure tone or impulsive character present. | + 5 |

TABLE A-11: ESTIMATED DISTANCE (IN FEET) TO RAILROAD NOISE CONTOURS, SISKIYOU COUNTY, 1978.

| Railroad and Segment | Decibels (db (A)) in Ldn 75 | 70 | 65 | 60 |
|---|---|---|---|---|
| Southern Pacific | | | | |
| Shasta County - Weed | | 340 | 625 | 1,140 |
| Weed - Oregon via Macdoel | 190 | 370 | 640 | 1,250 |
| Weed - Montague | | 125 | 270 | 475 |
| Montague - Oregon | | | 170 | 320 |
| McCloud River | | | | |
| McCloud - Mt. Shasta City | | 125 | 270 | 480 |
| McCloud | | 170 | 335 | 600 |


LEGEND
NOISE CONTOURS
Current (1974-77)
Projected (1995)
70 dBA
65 dBA
60 dBA
HOUSING UNITS
• Permanent
▲ Mobilehome
MEDIAN AMBIENT NOISE
51 Specific recording location
51 Estimated median
HAPPY CAMP AIRPORT
SCALE 1" = 2000'
HAPPY CAMP HIGH SCHOOL
HAPPY CAMP ELEMENTARY SCHOOL
PARK
SECOND AVE
HIGHWAY 96
60
65
70
1000'+
SCALE
0 200 400

**MAP 1**




## LEGEND

NOISE CONTOURS

| Current (1974-77) | | Projected (1995) |
|---|---|---|
| ——— | 70 dBA | - - - - - - |
| ——— | 65 dBA | - - - - - - |
| ——— | 60 dBA | - - - - - - |

HOUSING UNITS

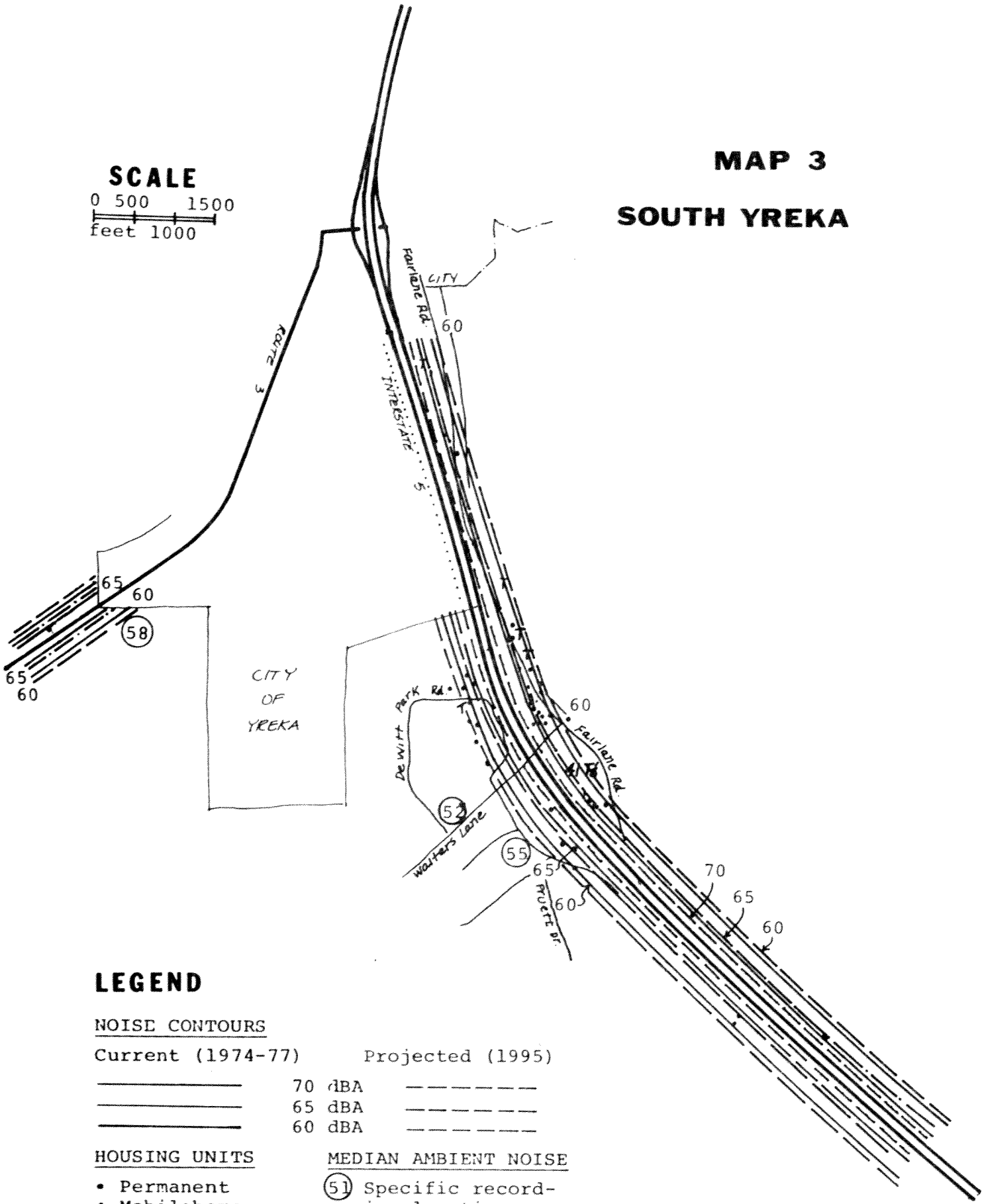
- • Permanent
- ▲ Mobilehome
- T

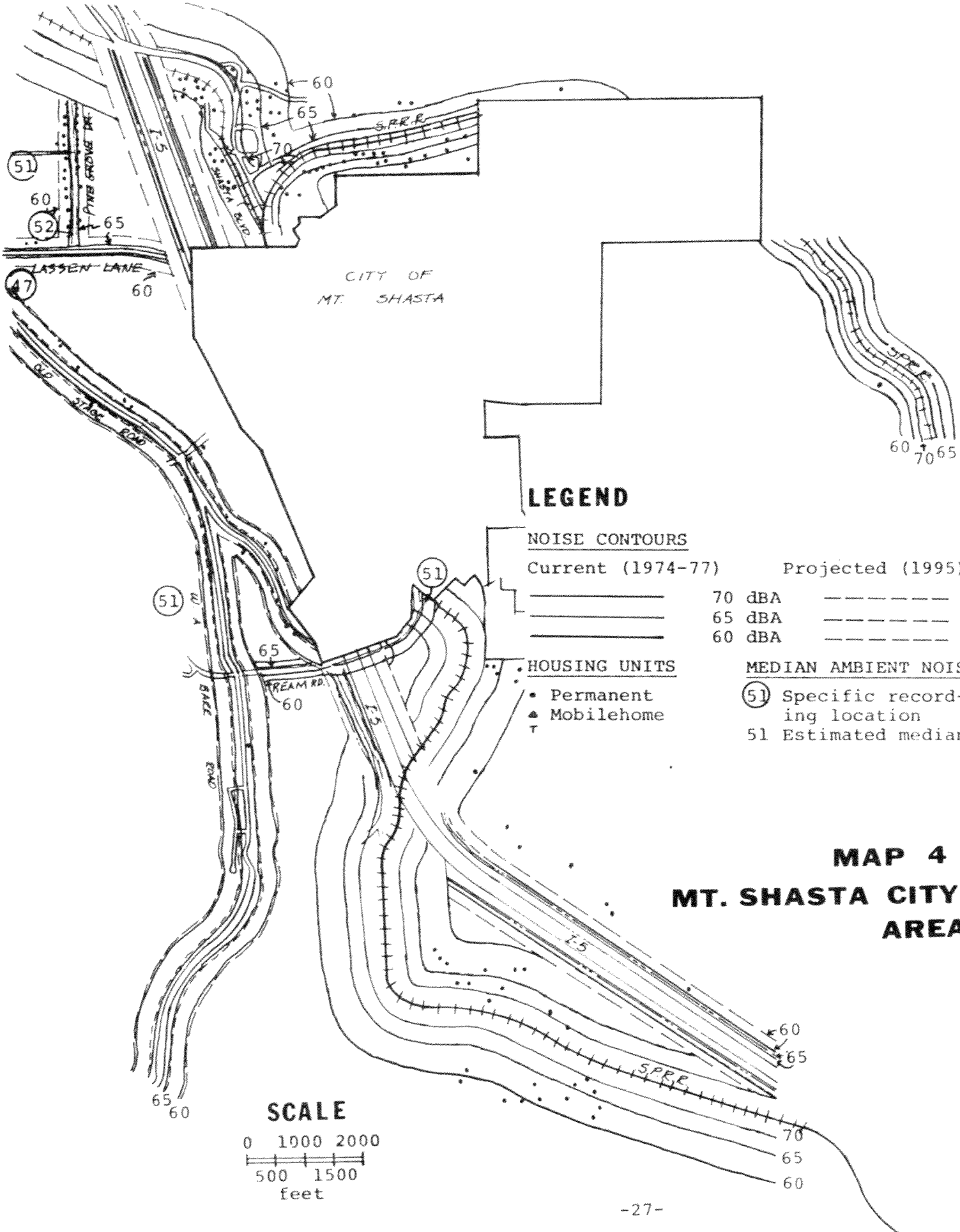
MEDIAN AMBIENT NOISE

- (51) Specific recording location
- 51 Estimated median

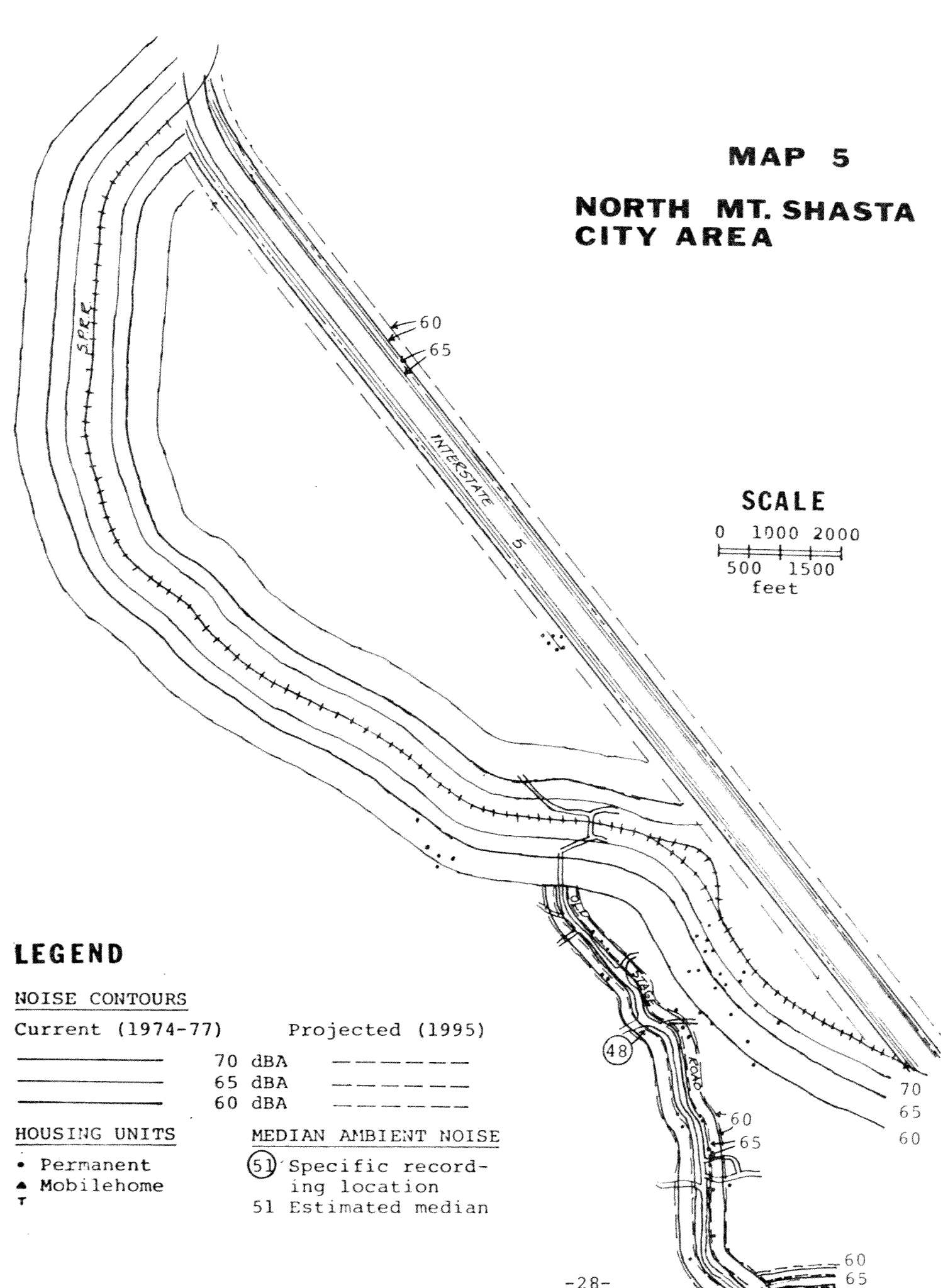
# MAP 2

## WEED (carrick's addition)

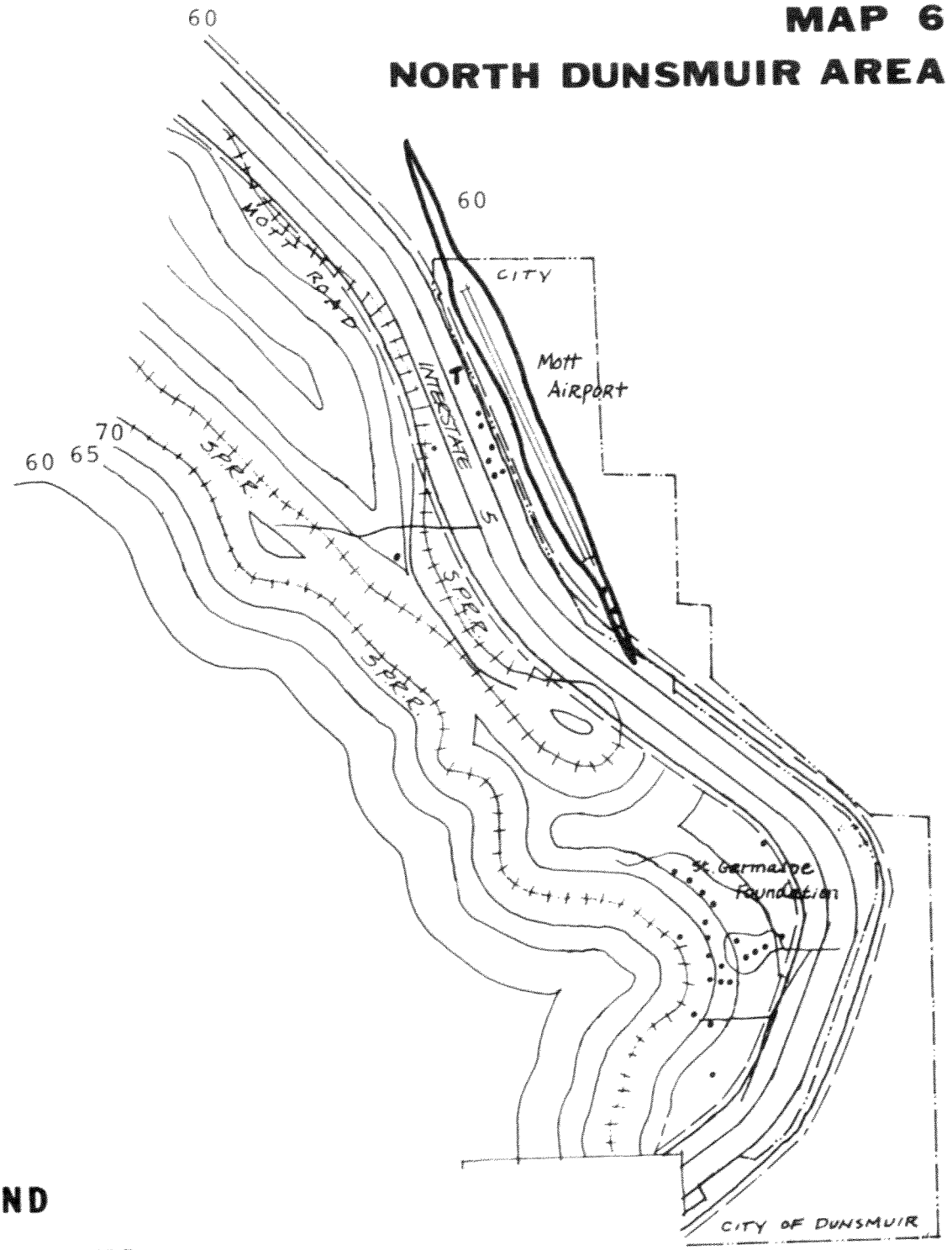

MAP 3
SOUTH YREKA
SCALE
0 500 1500
feet 1000
CITY
60
Fairlane Rd.
INTERSTATE 5
65
60
58
CITY OF YREKA
DeWitt Park Rd.
60
Fairlane Rd.
52
Walters Lane
55
65
60
Fruete Dr.
70
65
60
LEGEND
NOISE CONTOURS
Current (1974-77)
Projected (1995)
70 dBA
65 dBA
60 dBA
HOUSING UNITS
Permanent
Mobilehome
MEDIAN AMBIENT NOISE
(51) Specific recording location
51 Estimated median




# MAP 4
# MT. SHASTA CITY
# AREA


MAP 5
NORTH MT. SHASTA CITY AREA
SCALE
0 1000 2000
500 1500
feet
SPRR
INTERSTATE 5
60
65
OLD STAGE ROAD
48
70
65
60
60
65
60
65
LEGEND
NOISE CONTOURS
Current (1974-77)
Projected (1995)
70 dBA
65 dBA
60 dBA
HOUSING UNITS
• Permanent
▲ Mobilehome
T
MEDIAN AMBIENT NOISE
(51) Specific recording location
51 Estimated median

# MAP 6
# NORTH DUNSMUIR AREA




## LEGEND

NOISE CONTOURS

| Current (1974-77) | | Projected (1995) |
|---|---|---|
| ——— | 70 dBA | - - - - - - - |
| ——— | 65 dBA | - - - - - - - |
| ——— | 60 dBA | - - - - - - - |

HOUSING UNITS

- • Permanent
- ▲ Mobilehome
- T

MEDIAN AMBIENT NOISE

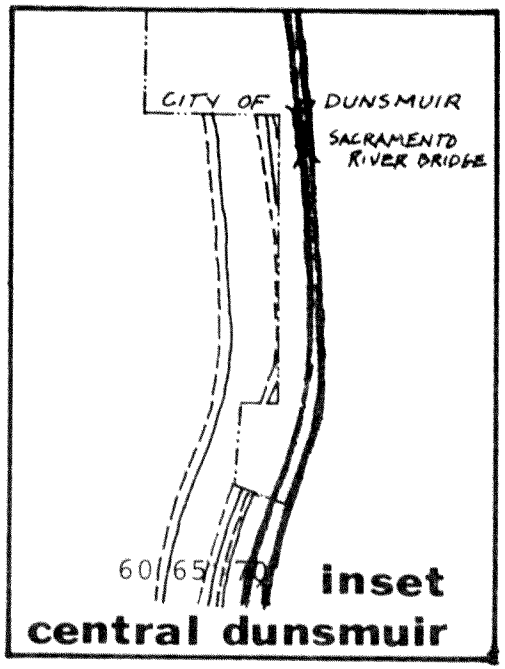
- (51) Specific recording location
- 51 Estimated median

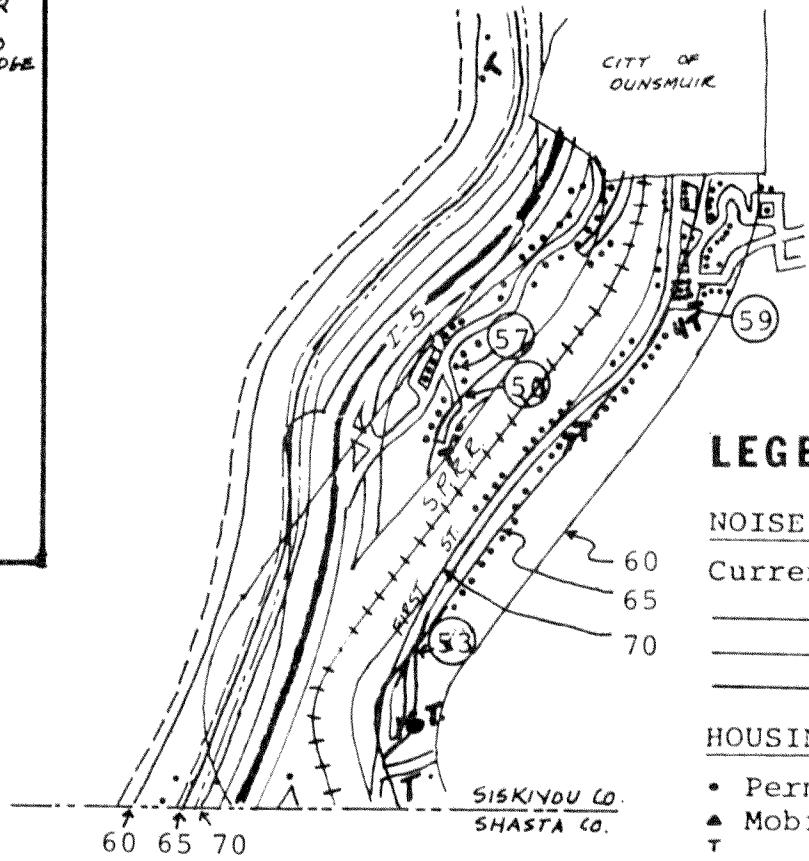
## SCALE

0 1000 2000

500 1500

feet




## SCALE

0 1000 2000

500 1500

feet

## LEGEND

NOISE CONTOURS

| Current (1974-77) | | Projected (1995) |
|---|---|---|
| ——— | 70 dBA | — — — — — |
| ——— | 65 dBA | — — — — — |
| ——— | 60 dBA | — — — — — |

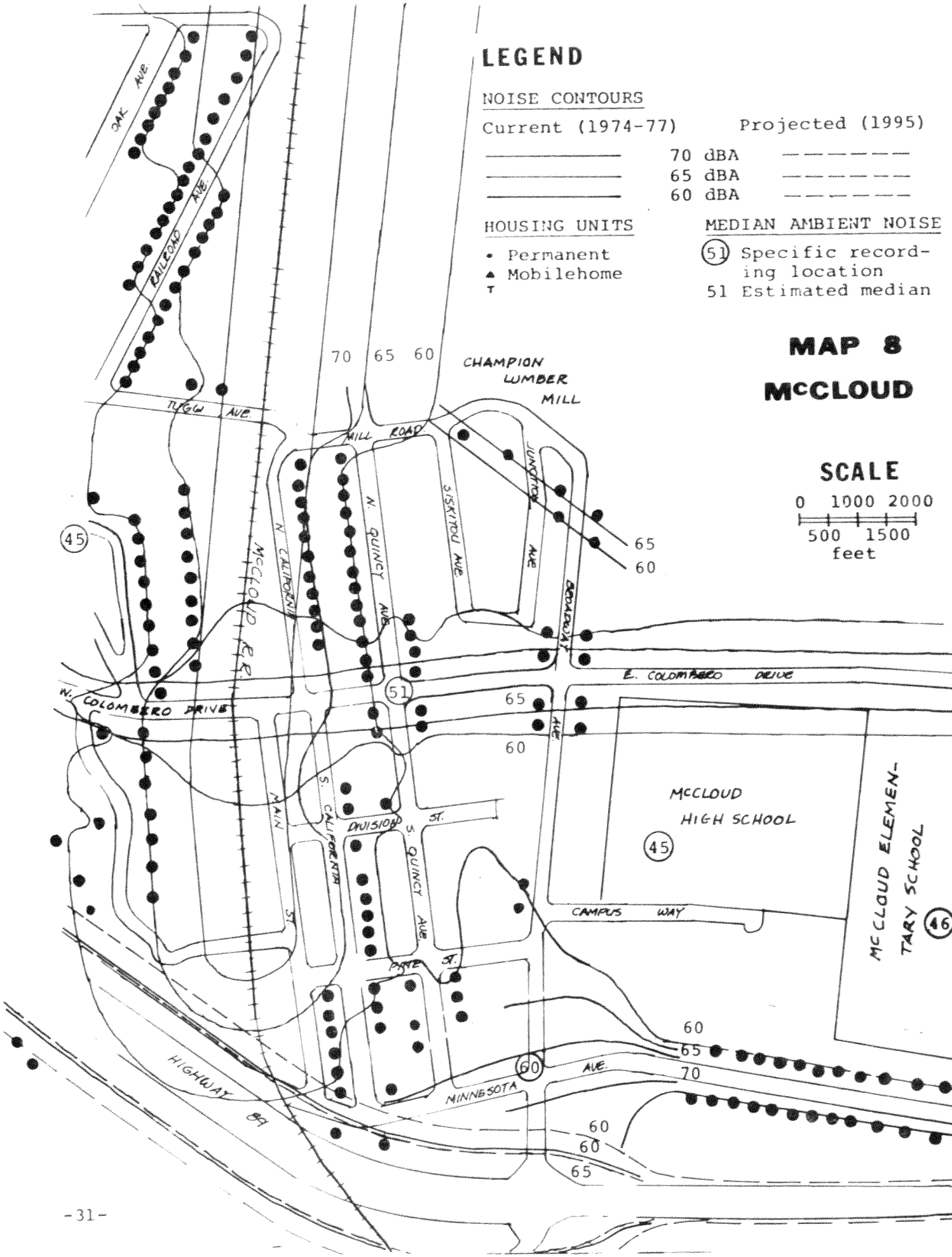
HOUSING UNITS

- • Permanent
- ▲ Mobilehome
- T

MEDIAN AMBIENT NOISE

- (51) Specific recording location
- 51 Estimated median

# MAP 7
# SOUTH DUNSMUIR AREA


LEGEND
NOISE CONTOURS
Current (1974-77)
Projected (1995)
70 dBA
65 dBA
60 dBA
HOUSING UNITS
• Permanent
▲ Mobilehome
MEDIAN AMBIENT NOISE
(51) Specific recording location
51 Estimated median
MAP 8
McCLOUD
SCALE
0 1000 2000
500 1500
feet
OAK AVE
RAILROAD AVE
TUTTLE AVE
MILL ROAD
CHAMPION LUMBER MILL
JUNCTION AVE
SISKIYOU AVE
N. QUINCY AVE
N. CALIFORNIA
McCLOUD R.R.
E. COLOMBERO DRIVE
N. COLOMBERO DRIVE
MAIN ST
S. CALIFORNIA
DIVISION ST
S. QUINCY AVE
PINE ST
CAMPUS WAY
McCLOUD HIGH SCHOOL
McCLOUD ELEMENTARY SCHOOL
MINNESOTA AVE.
HIGHWAY 89
70 65 60
65
60
45
51
46
60

## LEGEND

NOISE CONTOURS

Current (1974-77) Projected (1995)

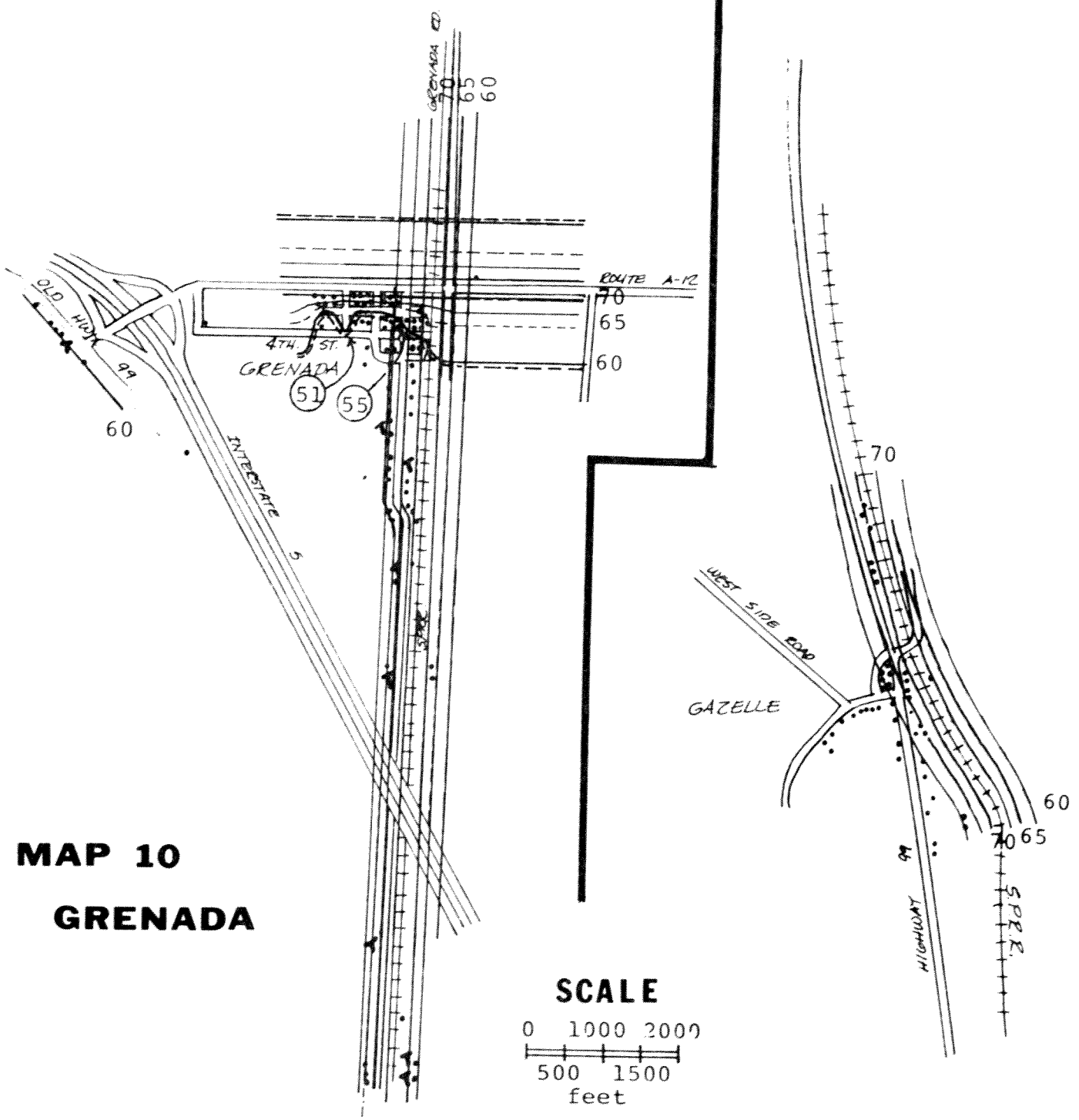
70 dBA
65 dBA
60 dBA

HOUSING UNITS

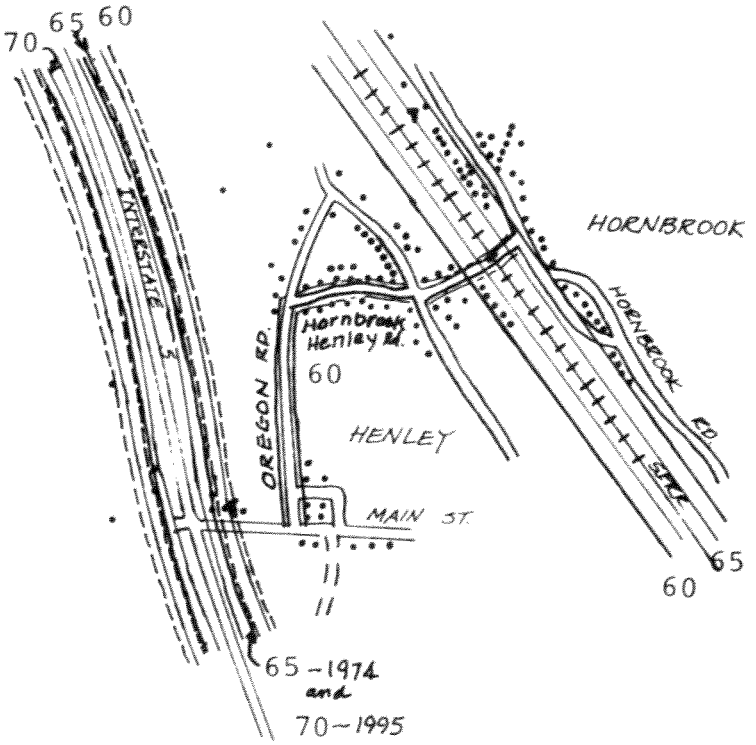
- Permanent
- Mobilehome

MEDIAN AMBIENT NOISE

(51) Specific recording location
51 Estimated median



# MAP 11
# HORNBROOK




## LEGEND

NOISE CONTOURS

| Current (1974-77) | | Projected (1995) |
|---|---|---|
| ———— | 70 dBA | — — — — — — — |
| ———— | 65 dBA | — — — — — — — |
| ———— | 60 dBA | — — — — — — — |

HOUSING UNITS

- • Permanent
- ▲ Mobilehome

MEDIAN AMBIENT NOISE

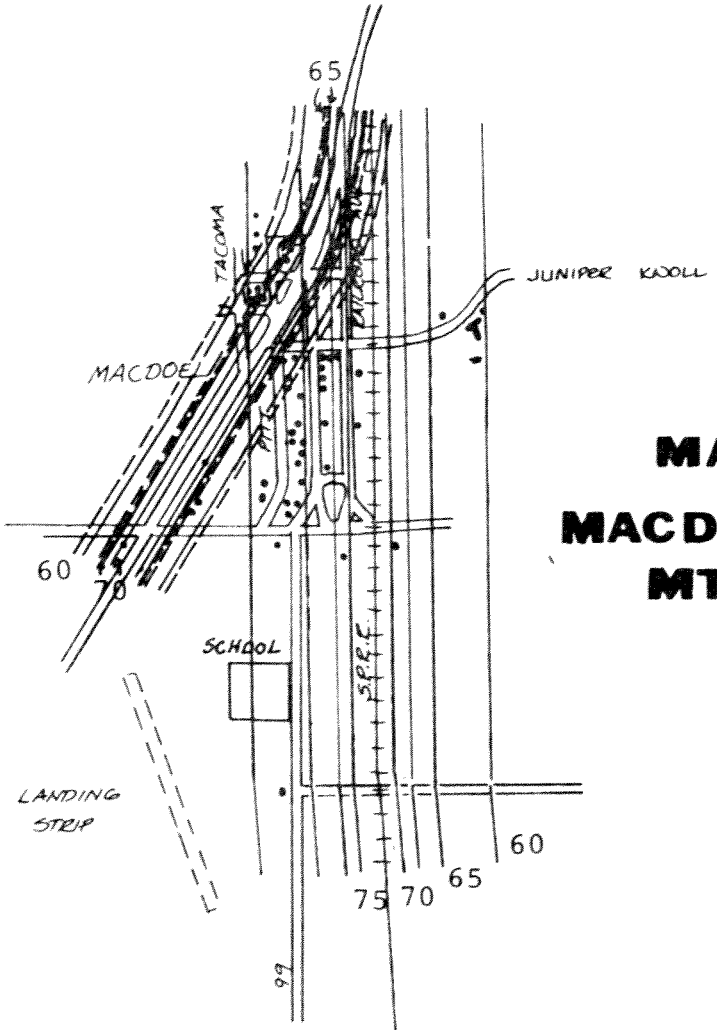
- (51) Specific recording location
- 51 Estimated median

## SCALE

0 1000 2000

500 1500

feet




# MAP 12

# MACDOEL/ MT. HEBRON

## LEGEND

NOISE CONTOURS

| Current (1974-77) | | Projected (1995) |
|---|---|---|
| ——— | 70 dBA | — — — — — |
| ——— | 65 dBA | — — — — — |
| ——— | 60 dBA | — — — — — |

HOUSING UNITS

- • Permanent
- ▲ Mobilehome
- T

MEDIAN AMBIENT NOISE

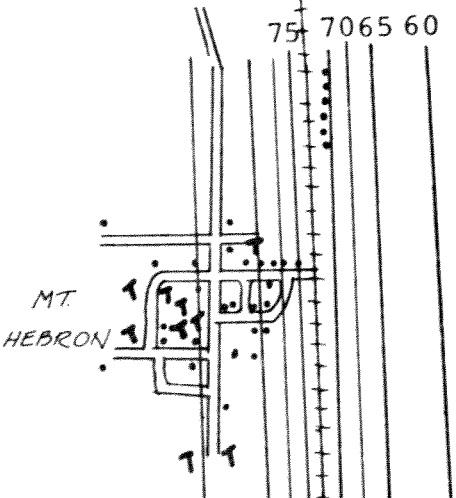
- (51) Specific recording location
- 51 Estimated median

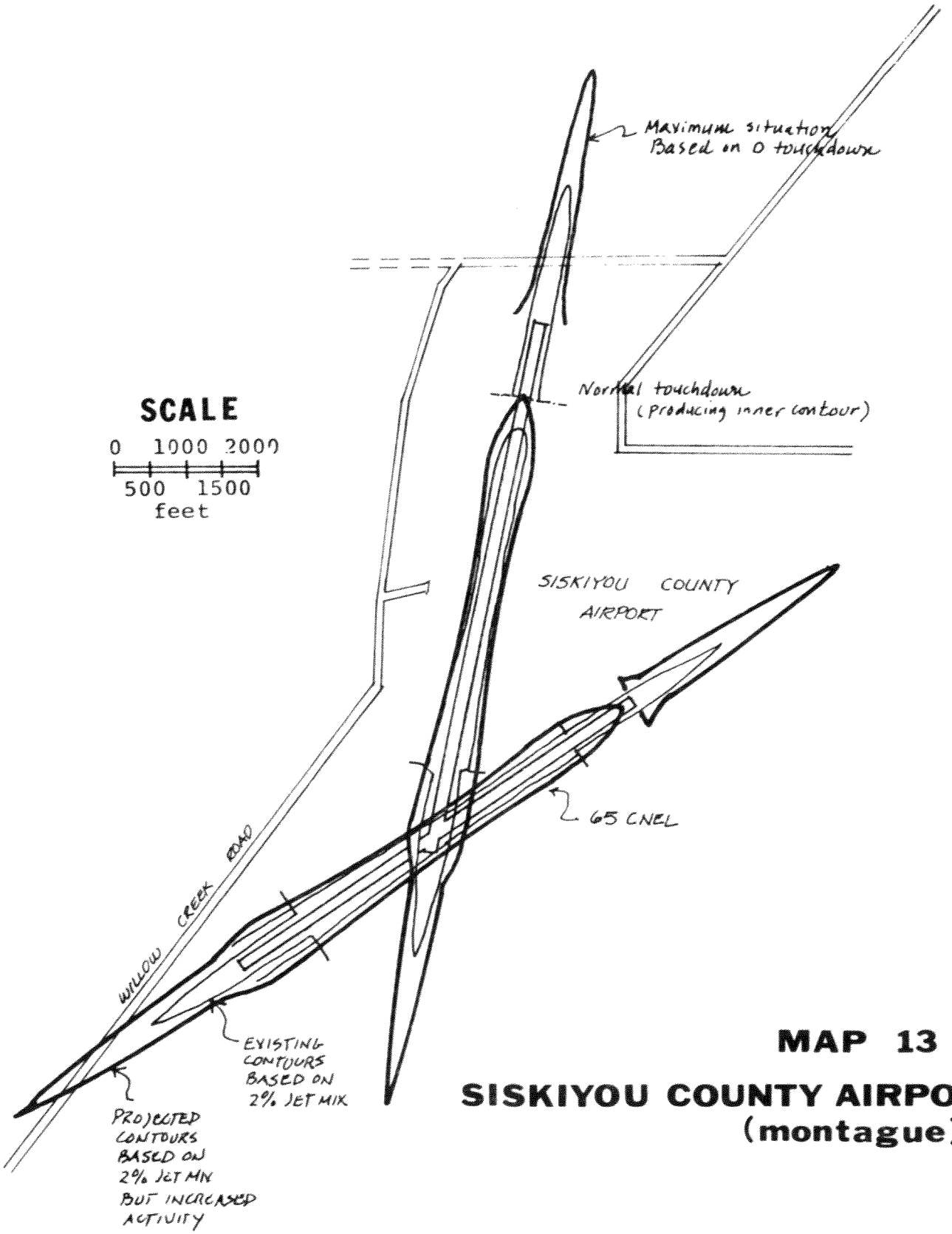
## SCALE

0 1000 2000

500 1500

feet

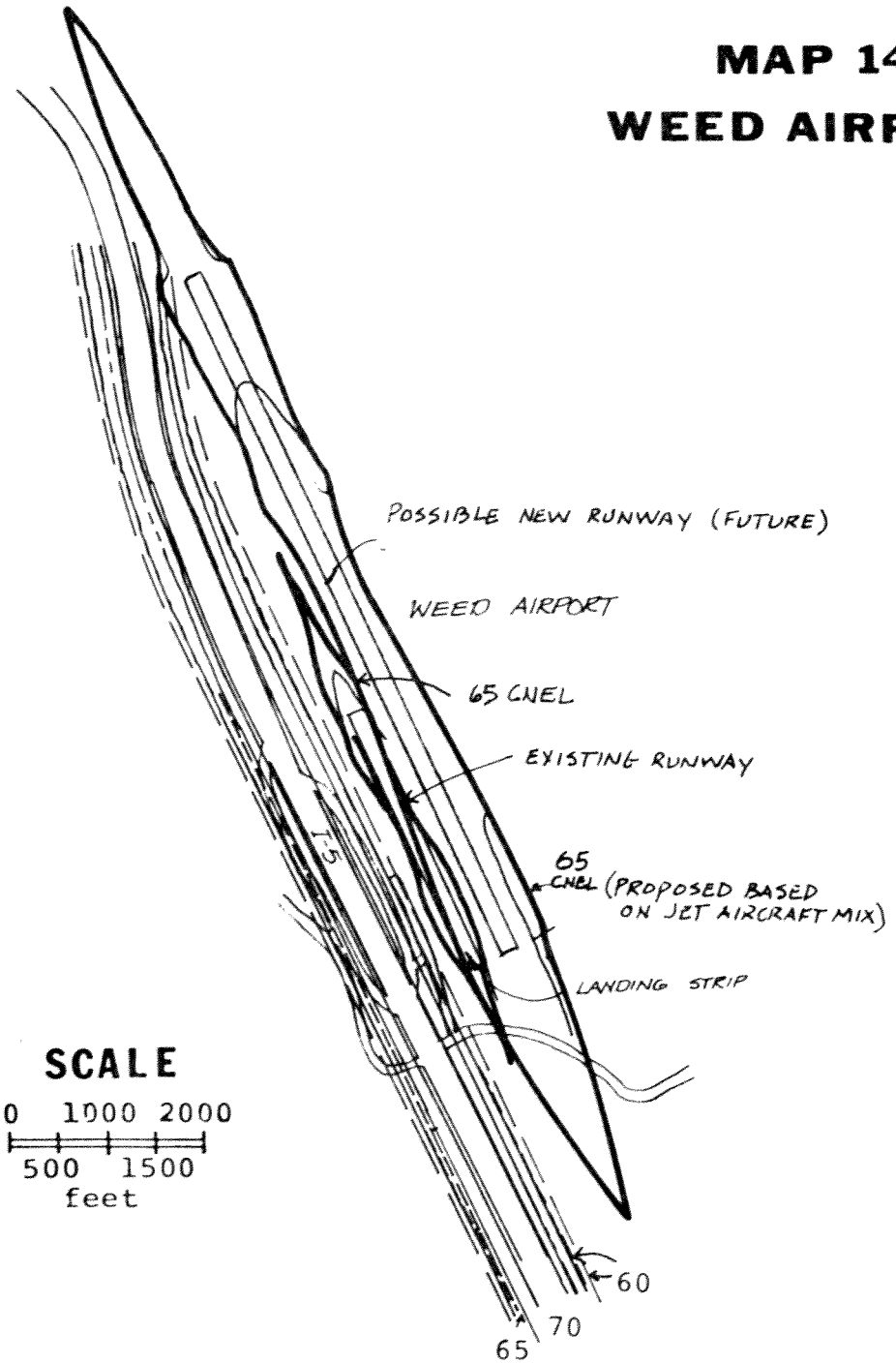





**MAP 13**

**SISKIYOU COUNTY AIRPORT**
**(montague)**

# MAP 14
# WEED AIRPORT




## LEGEND

NOISE CONTOURS

| Current (1974-77) | | Projected (1995) |
|---|---|---|
| ———— | 70 dBA | — — — — — |
| ———— | 65 dBA | — — — — — |
| ———— | 60 dBA | — — — — — |

HOUSING UNITS

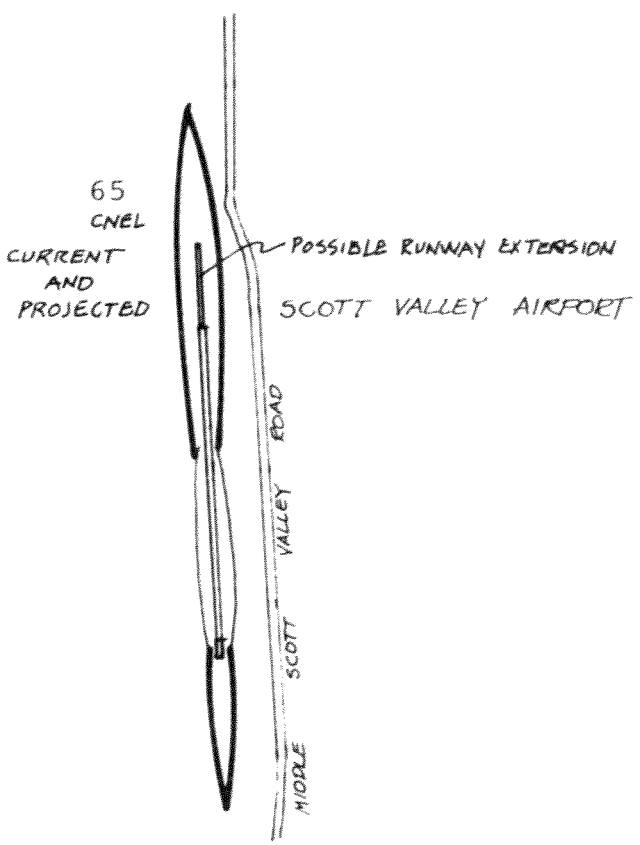
- • Permanent
- ▲ Mobilehome

MEDIAN AMBIENT NOISE

- (51) Specific recording location

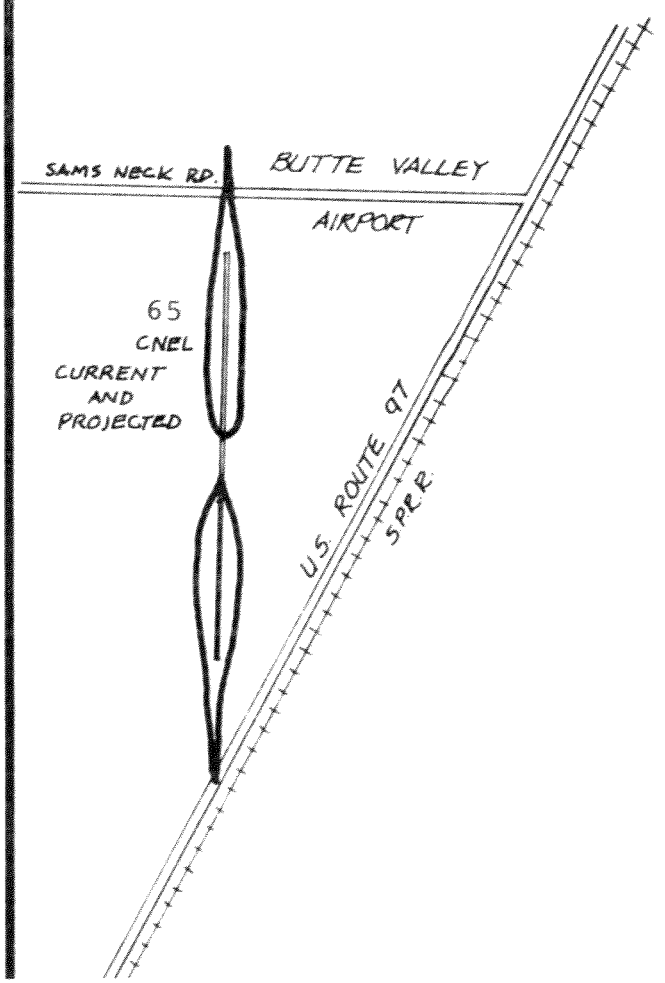
## MAP 15

## SCOTT VALLEY AIRPORT




## MAP 16

## BUTTE VALLEY AIRPORT




## LEGEND

NOISE CONTOURS

| Current (1974-77) | | Projected (1995) |
|---|---|---|
| ———— | 70 dBA | — — — — — |
| ———— | 65 dBA | — — — — — |
| ———— | 60 dBA | — — — — — |

HOUSING UNITS

- • Permanent
- ▲ Mobilehome
- T

MEDIAN AMBIENT NOISE

- (51) Specific recording location
- 51 Estimated median

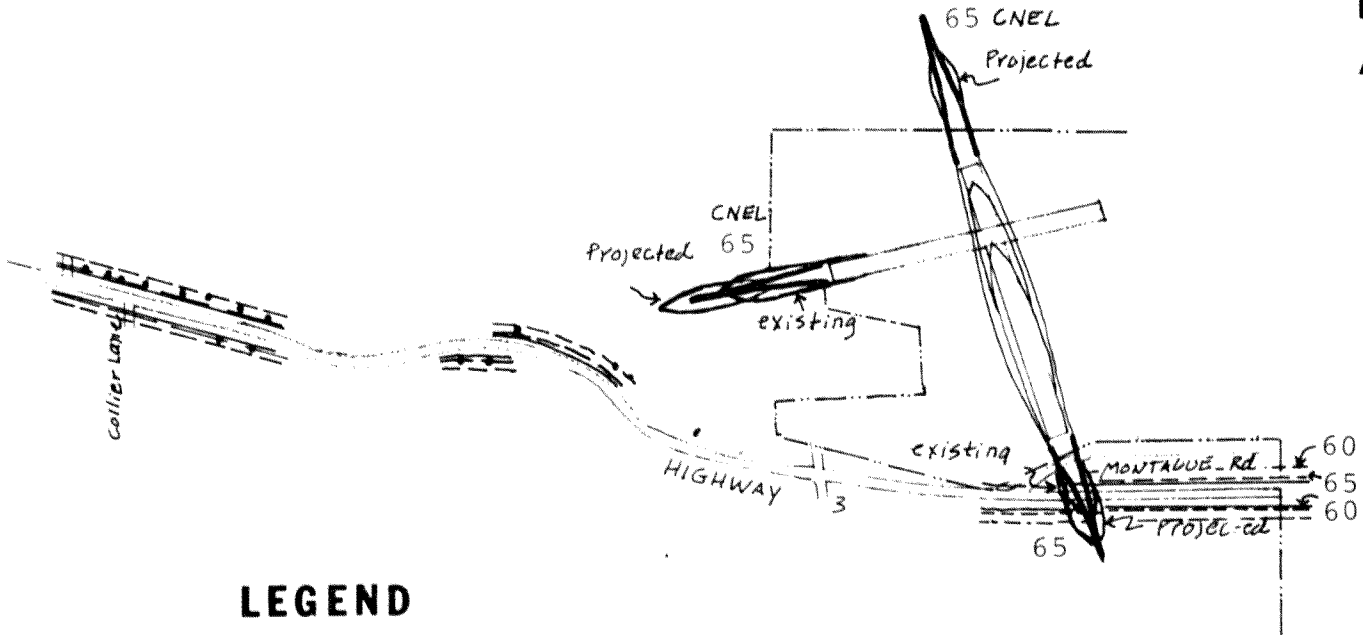
## SCALE

0 1000 2000

500 1500

feet

# MAP 17
# MONTAGUE-YREKA AIRPORT




## LEGEND

NOISE CONTOURS

| Current (1974-77) | | Projected (1995) |
|---|---|---|
| ——— | 70 dBA | - - - - - |
| ——— | 65 dBA | - - - - - |
| ——— | 60 dBA | - - - - - |

HOUSING UNITS

- • Permanent
- ▲ Mobilehome
- T

MEDIAN AMBIENT NOISE

- (51) Specific recording location
- 51 Estimated median

## SCALE

0 1000 2000

500 1500

feet