

Chapter 13. Noise Element

13.1 Purpose

This Element identifies the County’s approach to managing noise levels to minimize the exposure of community residents to excessive noise. The analysis follows the guidelines adopted by the Office of Noise Control of the California Department of Health Services.

13.2 Relationship to Other Elements

Noise levels are considered in the Land Use Element to avoid direct conflicts between neighboring uses and to establish patterns of land uses that minimize noise exposure. Policies in the Circulation Element related to road location, design, and non-motorized transportation can affect traffic noise levels. Policies of the Housing Element and Open Space Element also reflect noise considerations.

13.3 Background

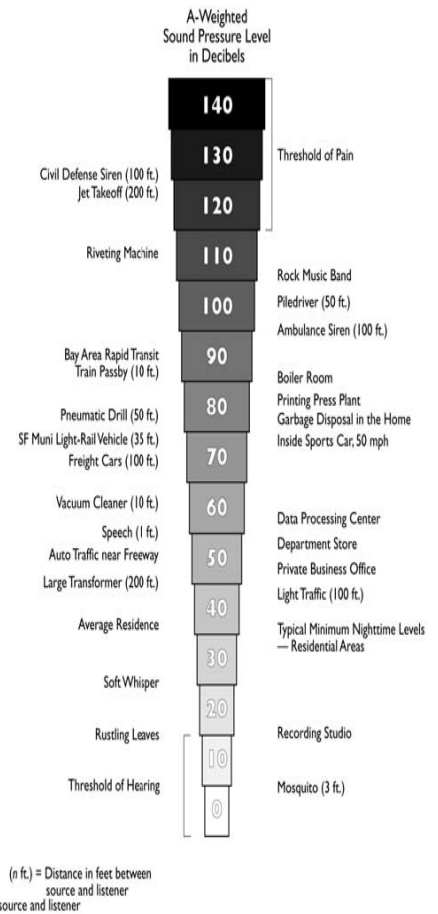
Measuring and Characterizing Noise

Assessing the community noise environment involves measuring three aspects of sound: level, frequency, and variation. Sound level is the magnitude or loudness of a sound, expressed in decibels (see Figure 13-1 and the glossary). Frequency is a measure of the pitch of the sound, and variation is the change in noise exposure over time. When sound is disagreeable or unwanted, it is considered noise.

Most community noise is produced by many distant sources, which rise and fall gradually throughout the day creating a relatively steady background sound having no identifiable source. The Community Noise Equivalent Level (CNEL) is a measure that describes average noise exposure over a period of time.

Because communities are more sensitive to impacts from nighttime noise, noise descriptors must specifically take this time period into account. Common measures include the CNEL and the Day-Night Average Level (Ldn). Both reflect noise exposure over an average day, with greater weight given to noise occurring during the evening and night. The two descriptors are roughly equivalent but CNEL is used in this Plan for regulating cumulative noise exposure over a 24-hour period.

Figure 13.1: Sound Level Comparison Chart



Noise levels of short duration, such as aircraft flyovers or concerts, are not well characterized by average noise level measurements yet are often the source of complaints. Maximum Noise Level (Lmax) is used in this Plan for the purposes of regulating short-term noise levels.

Principal Noise Sources

Table 13-A lists prominent noise sources within unincorporated areas of the county. Table 13-B provides results of community noise surveys by Charles Salter Associates conducted in April 2002 for selected areas, and Table 13-C is a survey of noise measurements along U.S. 101 from existing General Plans for Arcata, Eureka and McKinleyville.

The Map Book Appendix contains noise level contours for state highways, selected county roads, county airports, and other prominent sources. Other noise sources not included in the inventory, but at times significant sources of short-term noise, are from persons, pets and livestock, industrial equipment, and construction sites.

COMMUNITY	SOURCE OF NOISE			
	ROADS	AIRPORTS	RAILROAD*	STATIONARY SOURCES
ALTON	U.S. 101, State Highway 36	Rohnerville	Northwestern Pacific	NONE
ARCATA	U.S. 101, State Highways 299 & 255	NONE	Northwestern Pacific	NONE
BLOCKSBURG	NONE	NONE	NONE	Gravel operations
BLUE LAKE	State Highway 299	NONE	NONE	Gravel operations
BRIDGEVILLE	NONE	NONE	NONE	Gravel operations
CAPETOWN	NONE	NONE	NONE	Gravel operations
CARLOTTA	State Highway 36	NONE	NONE	Gravel operations
DINSMORE	State Highway 36	Dinsmore Airport	NONE	NONE
DYERVILLE	NONE	NONE	NONE	Gravel operations
EUREKA	U.S. 101, Myrtle Ave. Harris, Henderson & "H" St	Murray Field	Northwestern Pacific	Redwood Acres
FAIRHAVEN	New Navy Base Rd.	City of Eureka Airport	NONE	Racetrack
FERNDALE	State Highway 211	NONE	NONE	Fairgrounds, Gravel operations
FLDDBROOK	NONE	NONE	NONE	NONE

Table 13-A. Inventory of Prominent Sources of Noise within Communities of Humboldt County (Continued)				
	SOURCE OF NOISE			
COMMUNITY	ROADS	AIRPORTS	RAILROAD*	STATIONARY SOURCES
FIELDS LANDING	U.S. 101	NONE	Northwestern Pacific	Shipping operations
FORTUNA	U.S. 101, Main St.	Rohnerville Airport	Northwestern Pacific	Gravel operations
FRESHWATER	Freshwater Rd.	NONE	NONE	NONE
GARBERVILLE	U.S. 101	Airport	NONE	Gravel operations
HOOPA	State Highway 96	Former County Airport	NONE	Gravel operations
HYDESVILLE	State Highway 36, Rohnerville Rd.	Rohnerville	NONE	NONE
KNEELAND	NONE	Kneeland Airport	NONE	NONE
LOLETA	NONE	NONE	Northwestern Pacific	NONE
MANILA	State Highway 255 (New Navy Base Rd.)	NONE	NONE	NONE
MAPLE CREEK	NONE	NONE	NONE	Gravel operations
MARTIN'S FERRY/ WEITCHPEC	NONE	NONE	NONE	Gravel operations
McKINLEYVILLE	U.S. 101, Central Ave.	Eureka/Arcata Airport	NONE	Gun Club
MOONSTONE/ WESTHAVEN	U.S. 101	NONE	NONE	NONE
ORLEANS	NONE	NONE	NONE	Gravel operations
ORICK	U.S. 101	NONE	NONE	NONE
PETROLIA	NONE	NONE	NONE	Gravel operations
REDWAY	Redwood Dr.	NONE	NONE	NONE
RIO DELL	U.S. 101, Wildwood Ave.	NONE	Northwestern Pacific	NONE
ROHNERVILLE (See Fortuna)				
SAMOA	New Navy Base Rd.	NONE	NONE	Pulp mill, cogeneration plant, shipping operations

Table 13-A. Inventory of Prominent Sources of Noise within Communities of Humboldt County (Continued)				
COMMUNITY	SOURCE OF NOISE			
	ROADS	AIRPORTS	RAILROAD*	STATIONARY SOURCES
SCOTIA	U.S. 101	NONE	Northwestern Pacific	Mill, gravel operations
TRINIDAD	U.S. 101	NONE	NONE	NONE
WEOTT	U.S. 101	NONE	NONE	NONE
WILLOW CREEK	State Highways 299 & 96	NONE	NONE	Gravel operations

* Note: The former Northwestern Pacific Railroad is now under the direction of the North Coast Railroad Authority. While local rail lines have not operated on a regular basis for several years, future rail usage should continue to be considered in land use planning decisions, unless the railroad right-of-ways are abandoned.

Traffic Noise

Traffic noise depends primarily on the speed of traffic and the percentage of truck traffic. The primary source of noise from automobiles is high-frequency tire noise, which increases with vehicle speed. In addition, trucks and older automobiles produce engine and exhaust noise, and trucks generate wind noise.

As illustrated in Table 13-B, Humboldt County is subject to noise impacts primarily from U.S. Highway 101 (U.S. 101), which creates noise in areas up to 500 feet away. Differences in elevation can amplify or dampen noise levels; for example, noise from a thoroughfare in a trough or valley between residential areas will be reflected upward and focused while noise from an elevated thoroughfare may dissipate. On flat ground, a buffer (such as a sound wall or dense vegetation) will greatly reduce noise escaping to surrounding areas. The California Department of Transportation (Caltrans) sometimes installs sound walls along state roads when new construction or widening is proposed. In Humboldt County, CalTrans has not pursued sound wall construction along existing highways.

Table 13-B. Traffic Noise Levels in Humboldt County on U.S. Highway 101, April 10-11, 2002					
Location	Post Mile	Measurement Distance (ft.)	CNEL	Distance to 65 CNEL (ft.)	Distance to 60 CNEL (ft.)
Richardson Grove	1.6	11	76	56	121
North of Rio Dell	55.0	23	79	186	400
Singley Rd.	64.4	30	78	323	500
Indianola cutoff	82.6	19	80	179	385
School Rd.	91.4	23	77	147	318
Westhaven Dr.	98.7	20	78	149	322
North of Orick city limits	122.0	20	73	69	149

Source: Charles Salter Associates, 2002.

Noise surveys were conducted at various locations along U.S. 101 over a 24-hour period in April, 2002. Monitored sites included urban and rural areas of the county. The study shows distances from the center of the highway's outer lane to the 60-dB CNEL contour ranged from 121 feet at Richardson Grove (near the county's southern border) to 500 feet at Singley Road (south of the Eureka Community Planning Area).

Table 13-C lists the three sections of roadway in Arcata, McKinleyville, and Eureka with the widest 65-dB and 60-dB CNEL contours. All of these areas represent segments of U.S. 101. It is notable that in Arcata the highway is separated from surface roads in a designated right-of-way, while in Eureka the highway is part of the city's street grid.

Table 13-C. Highest-Noise Roadways in Humboldt County Communities			
Community	Roadway	Distance to 65 dB CNEL (ft.)	Distance to 60 dB CNEL (ft.)
Arcata	U.S. 101, Sunset Ave. to SH 299	382	823
	U.S. 101, Samoa Blvd. to Sunset Ave.	379	816
	U.S. 101, Bayside Rd. to Samoa Blvd.	361	778
McKinleyville	U.S. 101, SR 200 to School Rd.	185	400
	U.S. 101, School Rd. to Murray Rd.	185	400
	U.S. 101, Murray Rd. to Airport Rd.	150	350
Eureka	U.S. 101, end of 5th St. to Murray Field	141	305
	U.S. 101, Sunset Ave. to SH 299	137	295
	U.S. 101, Harris St. to Wabash St.	125	270

Sources: City of Arcata General Plan EIR, 1998; City of Eureka General Plan Background Report, 1997; McKinleyville CPA EIR, 1999.

Airport Noise

Airport noise caused by aircraft depends primarily on the type of aircraft and the frequency and direction of flights. Noise from aircraft warming up early in the morning can also be a significant source of noise from airports. Diagrams showing existing and projected noise levels associated with airport noise are contained in the County's Airport Land Use Compatibility Plans. The most current diagrams are shown in the Map Book Appendix.

Noise Compatibility

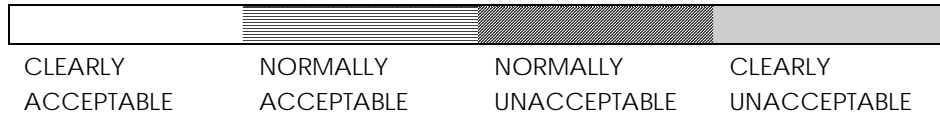
Evaluating new development projects for noise impacts should be based on a comparison of the noise compatibility standards in Table 13-D with noise contours and other available information. Fences, landscaping, and noise insulation can be used to mitigate the hazards of excessive noise levels.

A standard construction wood frame house reduces noise transmission by 15dBA. Since interior noise levels for residences are not to exceed 45dBA, the maximum acceptable exterior noise level for residences is 60dBA without any additional insulation being required. In areas where CNEL noise levels exceed 60dBA, the need for additional noise insulation will vary depending on the land use designation; adjacent uses; distance-to-noise source; and intervening topography, vegetation, and other buffers. The building code provides standards for meeting noise insulation requirements.

Appropriate standards for short-term noise levels measured by Lmax varies with the type of land use and time of day. Acceptable daytime levels in industrial and commercial areas are typically based on a combination of health and nuisance considerations and typically do not exceed 85 dBA. In residential areas, standards are typically set to avoid the perception of nuisance, such as noise levels that block normal conversation. Noise level above 66 dBA requires raised voices to be heard at a distance of three feet. Indoor noise levels between 50 and 60 dBA can disturb sleep.

The perception of nuisance will vary with the sound level, frequency, and fluctuation. It also depends upon the character of the sound, number of noise events, familiarity and predictability, and the attitude of the listener. CNEL and Lmax are typically the basis for making nuisance determinations but other factors may be considered. For example, an annual high school parade may exceed residential noise levels but might not be deemed a nuisance.

Table 13-D Land Use / Noise Compatibility Standards



LAND USE CATEGORY	Maximum Interior Noise Levels*	LAND USE INTERPRETATION FOR CNEL (or Ldn) VALUE					
		50 – 60	61 - 70	71 - 80	81 - 90	91+	
Residential Single Family, Duplex, Mobile Homes	45						
Residential Multiple Family, Dormitories, etc.	45						
Transient Lodging	45						
School Classrooms, Libraries, Churches	45						
Hospitals, Nursing Homes	45						
Auditoriums, Concert Halls, Music Shells	35						
Sports Arenas, Outdoor Spectator Sports							
Playgrounds, Neighborhood Parks							
Golf Courses, Riding Stables, Water Rec., Cemeteries							
Office Buildings, Personal, Business & Professional	50						
Commercial: Retail, Movie Theaters, Restaurants	50						
Commercial: Wholesale, Some Retail, Ind., Mfg., Util.							
Manufacturing, Communications(Noise Sensitive)							
Livestock Farming, Animal Breeding							
Agriculture (except Livestock), Mining, Fishing							
Public Right-of-Way							
Extensive Natural Recreation Areas							

*Due to exterior sources
(Source: Bolt, Beranek, and Newman, Inc., 1974)

CLEARLY ACCEPTABLE: The noise exposure is such that the activities associated with the land use may be carried out with essentially no interference. (Residential areas: both indoor and outdoor noise environments are pleasant.)

NORMALLY ACCEPTABLE: The noise exposure is great enough to be of some concern, but common constructions will make the indoor environment acceptable, even for sleeping quarters. (Residential areas: the outdoor environment will be reasonably pleasant for recreation and play at the quiet end and will be tolerable at the noisy end.)

NORMALLY UNACCEPTABLE: The noise exposure is significantly more severe so that unusual and costly building constructions are necessary to ensure adequate performance of activities. (Residential areas: barriers must be erected between the site and prominent noise sources to make the outdoor environment tolerable.)

CLEARLY UNACCEPTABLE: The noise exposure at the site is so severe that construction costs to make the indoor environment acceptable for performance of activities would be prohibitive. (Residential areas: the outdoor environment would be intolerable for normal residential use.)

13.4 Goals and Policies

Goals

- N-G1. Excessive Noise.** A quiet and healthful environment with limited disagreeable noise.
- N-G2. Incompatible Land Uses.** Land uses arranged and managed to reduce annoyance and complaints and minimize the exposure of community residents to excessive noise

Policies

- N-P1. Minimize Noise from Stationary and Mobile Sources.** Minimize stationary noise sources and noise emanating from temporary activities by applying appropriate standards for average and short-term noise levels during permit review and subsequent monitoring.
- N-P2. Guide to Land Use Planning.** Evaluate current noise levels and mitigate projected noise levels when making community planning and zoning decisions to minimize the exposure of community residents to nuisance noise levels. Minimize vehicular and aircraft noise exposure by planning land uses compatible with transportation corridors and airports, and applying noise attenuation designs and construction standards. Avoid zoning patterns that permit people to “move to the nuisance” unless mitigated through project conditions or recorded notice.
- N-P3. Noise from U.S. Highway 101 (U.S. 101) and State Highway 299.** The County shall support efforts to reduce noise levels on U.S. 101 and State Highway 299 along sections in proximity to concentrated residential development through prioritized roadway surface maintenance, use of noise-reducing surface treatments, traffic-safe tree or shrub plantings, or, in cases of significant noise exposure, use of lower speed limits and construction of sound walls.

13.5 Standards

- N-S1. Land Use/Noise Compatibility Matrix.** The Land Use/Noise Compatibility Standards (Table 13-D) shall be used as a guide to ensure compatibility of land uses. Development may occur in areas identified as “normally unacceptable” if mitigation measures can reduce indoor noise levels to “Maximum Interior Noise Levels” and outdoor noise levels to the maximum “Normally Acceptable” value for the given Land Use Category.
- N-S2. Noise Impact Combining Zones.** The 20-year projected noise contours in the Map Book Appendix and the most current Airport Land Use Compatibility Plans shall be used to identify noise impact combining zone areas to indicate where special sound insulation measures may apply.
- N-S3. Environmental Review Process.** For noise sensitive locations where noise contours do not exist, the environmental review process required by the California Environmental Quality Act shall be utilized to generate the required

analysis and determine the appropriate mitigation per Plan and state standards. Future noise levels shall be predicted for a period of at least 10 years from the time of building permit application.

- N-S4. Noise Study Requirements.** When a discretionary project has the potential to generate noise levels in excess of Plan standards, a noise study together with acceptable plans to assure compliance with the standards shall be required. The noise study shall measure or model as appropriate, Community Noise Equivalent Level (CNEL) and Maximum Noise Level (Lmax) levels at property lines and, if feasible, receptor locations. Noise studies shall be prepared by qualified individuals using calibrated equipment under currently accepted professional standards and include an analysis of the characteristics of the project in relation to noise levels, all feasible mitigations, and projected noise impacts. *The Noise Guidebook* published by the U.S. Department of Housing and Urban Development, or its equivalent, shall be used to guide analysis and mitigation recommendations.
- N-S5. Uniform Building Code.** Use the Uniform Building Code as adopted for California (California Code of Regulations, Title 24, Appendix Chapter 12) for determining required noise separation requirements for buildings.
- N-S6. Noise Standards for Habitable Rooms.** Noise reduction shall be required as necessary to achieve a maximum of 45 CNEL (Community Noise Equivalent Level) interior noise levels in all habitable rooms per California building standards.
- N-S7. Noise Reduction Requirements for Exterior Areas in Residential Zones.** On new single family residential lots of 5,000 square feet or more, a usable outdoor living area at least 200 square feet in size per dwelling unit that meets the 60 CNEL (Community Noise Equivalent Level) standard shall be maintained somewhere on the property.
- N-S8. Short-term Noise Performance Standards Maximum Noise Level (Lmax).** The following noise standards, unless otherwise specifically indicated, shall apply to all property within their assigned noise zones and such standards shall constitute the maximum permissible noise level within the respective zones.

SHORT-TERM NOISE STANDARDS (Lmax)

<u>Zoning Designation</u>	Day (maximum)	Night (maximum)
	6:00 a.m. to 10:00 p.m.	10:00 p.m. to 6:00 a.m.
	<u>dBA</u>	<u>dBA</u>
CG, MG, MC, AE, TPZ,TC	85	75
CN, MB, ML	80	70
RM	70	60
RS, R2, RA	65	60

Decibel measurement made shall be based on a reference sound pressure of 0.0002 microbars as measured with a sound level meter using the "A" weighted network. Ambient noise without the noise source in operation shall be observed at 15 second intervals for a period of 15 minutes. The lowest reading is interpreted as the ambient noise level of that sampling point. If this reading is above the standard set for the noise zone, steps must be taken to determine the source or sources of the intruding high-level noise followed by appropriate control action before continuing the survey. If the reading is equal to or below the standard, the survey can proceed. With the noise source in operation, record the instantaneous response at 15 second intervals for a 15 minute period. Or, for a noise source of less than 15 minutes, record the instantaneous response at 15 second intervals for the time the noise source is in operation. The lowest response level recorded while the noise source is in operation is interpreted as the intruding noise level. Compare the intruding noise levels with the standard. If the noise level generated from the noise source exceeds the standard, the noise source is generating noise levels in excess of the allowable standards set for the noise zone.

13.6 Implementation Measures

- N-IM1. Noise Impact Combining Zone.** Utilize Noise Impact Combining Zone designations to identify areas where noise impact mitigations are required.
- N-IM2. Periodic Review of Combining Zones.** Periodically identify and evaluate potential noise problem areas for mitigation or as candidates for noise impact combining zones, particularly during Airport Land Use Compatibility Plan updates.
- N-IM3. Compliance Program.** The County shall investigate complaints of excessive noise and control noise sources consistent with the standards established by the Plan. Nuisance determinations shall be based on noise levels, duration, and number of noise events.
- N-IM4. Noise from U.S. Highway 101 (U.S. 101) and State Highway 299.** Working through its representation on Humboldt County Association of Governments (HCAOG), the County shall work with other affected jurisdictions and request California Department of Transportation (Caltrans) to consider implementing noise reduction measures on U.S. 101 and State Highway 299 along sections in proximity to concentrated residential development.