

IX. NOISE ELEMENT

Purpose

The purpose of the Noise Element is to protect the health and welfare of the community by promoting development which is compatible with established noise standards. This section has been prepared in conformance with Government Code § 65302(f) and the guidelines adopted by the State Office of Noise Control, pursuant to Health and Safety Code § 46050.1. Existing and future noise problems in Lakeport and its Sphere of Influence have been identified. The Noise Element will provide policies and implementation programs designed to reduce the community's exposure to excessive noise levels. Accomplishing this task requires an evaluation of the noise from sources such as roads, highways, recreation areas, aviation and from stationary sources such as factories.

Noise Characteristics

Noise is defined as unwanted sound. Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. Sound levels are usually measured and expressed in decibels (dB) with 0 dB corresponding roughly to the threshold of hearing.

Most of the sounds which we hear in the environment do not consist of a single frequency, but rather a broad band of frequencies, with each frequency differing in sound level. The intensities of each frequency add together to generate a sound. The method commonly used to quantify environmental sounds consists of evaluating all of the frequencies of a sound in accordance with a weighting that reflect the fact that human hearing is less sensitive at low frequencies and extreme high frequencies than in the mid-range frequency. This is called "A" weighting, and the decibel level so measured is called the A-weighted sound level (dBA). In practice, the level of a sound source is conveniently measured using a sound level meter that includes an electrical filter corresponding to the A-weighting curve.

Although the A-weighted noise level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of noise from distant sources which create a relatively steady background noise in which no particular source is identifiable. To describe the time-varying character of environmental noise, the statistical noise descriptors, L_{10} , L_{50} , and L_{90} , are commonly used. They are the A-weighted noise levels equaled or exceeded during 10%, 50%, and 90% of a stated time period. A single number descriptor called the L_{eq} is now also widely used. The L_{eq} is the average A-weighted noise level during a stated period of time.

In determining the daily level of environmental noise, it is important to account for the difference in response of people to daytime and nighttime noises. During the nighttime, exterior background noises are generally lower than the daytime levels. However, most household noise also decreases at night and exterior noise becomes very noticeable. Further, most people sleep at night and are very sensitive to noise intrusion. To account for human sensitivity to nighttime noise levels, a descriptor, the L_{dn} (day/night average sound level), was developed. The L_{dn}

divides the 24-hour day into the daytime of 7:00 AM to 10:00 PM and the nighttime of 10:00 PM to 7:00 AM. The nighttime noise level is weighted 10 dB higher than the daytime noise level. The Community Noise Equivalent Level (CNEL) is another similar 24 hour average which includes both an evening and nighttime weighting.

Human Response to Noise

The effects of noise on people can be categorized as follows:

- subjective effects of annoyance, nuisance, dissatisfaction;
- interference with activities such as speech, sleep, learning; and
- physiological effects such as startling, hearing loss.

The levels associated with environmental noise, in almost every case, produce effects only in the first two categories. Workers in industrial plants can experience noise in the last category. Unfortunately, there is as yet no completely satisfactory way to measure the subjective effects of noise, or of the corresponding reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance, and habituation to noise over differing individual past experiences with noise. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by the hearers.

The following relationships will be helpful in understanding the significance of increases in the A-weighted noise level:

- Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived.
- Outside of the laboratory, a 3 dB change is considered a just-perceivable difference.
- A change in level of at least 5 dB is required before any noticeable change in community response would be expected.
- A 10 dB change is subjectively heard as approximately a doubling in loudness, and would almost certainly cause an adverse change in community response.

In any typical noise environment about 10 percent of the population will object to any noise not of their own making and 25 percent will not react or complain at all, regardless of the level of noise being generated. Consequently, noise control measures are most beneficial to the remaining 65 percent of the population who are neither ultra-sensitive nor insensitive to noise. Negative reaction to noise generally increases with the increase in difference between background (or ambient) noise and the noise generated from a particular source such as traffic operations. In most situations, noise control measures need to reduce noise by 5 to 10 dB(A) in order to effectively reduce complaints.

People generally have the ability to distinguish one sound from a background of sounds, such as a telephone ringing over music. However, certain noise levels can render a sound inaudible. For example, heavy trucks can interfere with a conversation. Face-to-face conversation usually can proceed where the noise level is up to 66 dB(A), group conversations up to 50 to 60 dB(A), and public meetings, up to 45 or 55 dB(A), without interruption.

Sleep interference is more difficult to quantify, although studies have shown that progressively deeper levels of sleep require louder noise levels to cause a disturbance. The California Office of Noise Control (ONC) recommends that individual events within sleeping areas should not exceed 50 dB(A) in residential areas exposed to noise levels of 60 Ldn, or greater. Interior noise standards of 45 Ldn will protect against sleep interference.

Environmental noise, in almost every case, produces effects which are subjective in nature or involve interference with human activity. However, brief sounds at levels exceeding 70 dB(A) can produce temporary physiological effects such as constriction of blood vessels, changes in breathing and dilation of the pupils. Steady noises of 90 dB(A) have been shown to increase muscle tension and adversely affect simple decision making. Long-term exposure to levels exceeding 70 dB(A) can cause hearing loss.

Existing Noise Sources in Lakeport

The primary noise generators in Lakeport are vehicular traffic (including automobiles, trucks, buses, and motorcycles), boaters on Clear Lake, and during events at the race track at the County Fairgrounds.

The level of vehicular noise varies with the volume of traffic on a given roadway, the percentage of trucks, buses and motorcycles, the speed of the traffic, and the distance from the roadway. The major traffic noise generators are Highway 29, Main Street, Lakeport Boulevard, 11th Street, and High Street. Along most streets, the presence of densely-packed buildings will reduce the noise exposure significantly for subsequent rows of buildings. A row of buildings will generally reduce the noise level by about 5 decibels, significantly reducing the influence of local traffic noise beyond the street itself.

While the noise generated by the roadway system is most pervasive in the City of Lakeport, noise generated at the Lake County Fairgrounds and by activity on Clear Lake is also occasionally significant. Automobile races are frequently held at the Lake County Fairgrounds in the evenings, when nearby residents are most sensitive to intrusive noises. Noise sources at the races include the stock cars, the public address system, the crowd noise, and spectator traffic.

Noise generated by power boats on the lake is another major noise source in Lakeport. Large powerboats equipped with inboard engines without mufflers generate noise levels as high as 110 dBA at a distance of 50 feet. Larger outboard engines also generate noise levels of 65 to 95 dBA at a distance of 50 feet. When many boats are starting up together, for example early in the morning during a bass tournament, significant noise levels can be generated. Noise generated from boaters on Clear Lake has the potential to affect residents living well beyond the lake shore.

Other noise sources which occasionally represent problems in the City include: barking dogs; the use of power tools; seaplanes; helicopters; and machinery. The noise generated by these sources is most effectively controlled through the enforcement of the local noise ordinance.

At present, no significant amount of noise is produced by Lampson Field, a general aviation airport located outside of the City's Sphere of Influence. The City will continue to work with the County Airport Land Use Commission (ALUC) to monitor airport noise and implement suitable mitigation measures if they become necessary.

Future Noise Levels

Future noise levels will be largely attributable to vehicular traffic. Portions of several of the principal streets and highways listed below are projected to experience a significant increase in noise over 60 dBA.

- 6th Street
- 11th Street
- 20th Street
- Hartley Street
- Hill Road
- Lakeport Boulevard
- Main Street
- Martin Street
- Scotts Valley Road
- Parallel Drive
- Highways 29 and 175

It is anticipated that residences adjacent to the above streets will be exposed to excessive noise levels, defined as those over 60 dBA. The appropriate response contained in this section is to implement a variety of noise-mitigating measures and, where possible, condition future residential development to limit noise exposure.

Noise and Land Use Compatibility Standards

The most effective means of controlling noise is to prevent the development of incompatible land uses, rather than implementing after-the-fact techniques such as sound walls, earth berms or additional residential sound proofing. The objective of the Noise and Land Use Compatibility Standards is to provide an acceptable community noise environment and to minimize noise-related complaints from residents.

The Standards listed in [Table 15](#) should be used to evaluate the compatibility between land uses and future noise levels in Lakeport.

**Table 15
Noise and Land Use Compatibility Standards**

Land Use	Maximum Exterior Noise Level
Residential Development	Up to 60db
Transient Lodging: Motel and Hotel	Up to 60db
School, Library, Church, Hospital and Nursing Home	Up to 60db
Auditorium, Concert Hall, Amphitheater, Sports Arena	Up to 70db
Sports Arena, Outdoor Spectator Sports	Up to 75db
Playgrounds, Neighborhood Parks, Open Space	Up to 70db
Golf Course, cemetery	Up to 70db
Office Building, Business, Commercial & Professional	Up to 65db
Industrial, Manufacturing, Utilities	Up to 70db

The following considerations should be taken into account when using the Noise and Land Use Compatibility Standards:

1. The standard for maximum outdoor noise levels in residential areas is a Ldn of 60 dB. This standard is applied where outdoor use is a major consideration, such as backyards in single family housing developments and recreation areas in multifamily developments. This standard should not be applied to outdoor areas such as small decks and balconies typically associated with multifamily residential developments, which can have a higher standard of 65 Ldn;
2. The maximum acceptable interior noise level in new residential development required by the State of California Noise Insulation Standards is an Ldn of 45. This standard continues to be applied to single family and all other residential development in Lakeport. In addition, the interior noise level for offices shall be Ldn 45 dB or less;
3. These standards are not intended to be applied reciprocally. In other words, if an area is currently below the desired noise standard, an increase in noise up to the maximum should not be permitted. The impact of a proposed project on an existing use should be evaluated in terms of the potential for adverse community response based on existing community noise levels, regardless of the compatibility standards; and
4. The Land Use and Noise Compatibility Standards should be reviewed in relation to the specific source of noise. These standards are based on measurement systems which average noise over a 24-hour period and do not take into account single-event noise sources. For example, aircraft noise normally consists of a higher single-noise event than vehicular traffic and has been linked to sleep interference and other significant problems, but occurs infrequently in Lakeport. Different noise sources yielding the same composite noise exposure do not necessarily create the same environment. Additional standards may be applied on a case-by-case basis where supported by acoustical analysis to mitigate the effects of single-event noise sources.

OBJECTIVES, POLICIES & PROGRAMS

OBJECTIVE N 1: TO ENSURE COMPATIBILITY OF NEW DEVELOPMENT WITH THE EXISTING AND FUTURE NOISE ENVIRONMENT.

Policy N 1.1: Maintain Noise and Land Use Compatibility Standards. Attempt to maintain the noise and land use compatibility standards indicated in Table 15.

Program N 1.1-a: Review all land use and development proposals for compliance with the Noise and Land Use Compatibility Standards.

Responsibility: Community Development Department

Program N 1.1-b: Require a standard of Ldn 45 dB for indoor noise for all new residential development, including hotels and motels.

Responsibility: Community Development Department

Program N 1.1-c: Use the standards in Table 15 to determine the need for noise studies and require new developments to provide noise attenuation features as a condition of approving new projects.

Responsibility: Community Development Department

Program N 1.1-d: Require an acoustical study for all new residential projects with a future Ldn noise exposure of 60 dB or greater. The study shall describe how the project will comply with the Noise and Land Use Compatibility Standards.

Responsibility: Community Development Department

Program N 1.1-e: Require post-construction testing and sign-off by an acoustical engineer for residential and office projects exposed to an Ldn in excess of 65 dB to ensure compliance with the Noise and Land Use Compatibility Standards.

Responsibility: Community Development and Building Departments

OBJECTIVE N 2: TO REDUCE NOISE TO ACCEPTABLE LEVELS WHERE IT NOW EXCEEDS THOSE STANDARDS.

Policy N 2.1: Outdoor Noise in Residential Areas. Reduce outdoor noise in existing residential areas where economically and aesthetically feasible.

Program N 2.1-a: Verify projected noise levels with noise monitors at locations adjacent to residential and other noise sensitive areas where traffic volumes increase by over 50% from baseline noise data.

Responsibility: Community Development and Public Works Departments

Program N 2.1-b: Consider and carefully evaluate the noise impacts of all street, highway and other transportation projects.

Responsibility: Community Development and Public Works Departments

Program N 2.1-c: Continue to seek State and Federal funding to construct noise barriers where impact of noise can be significantly reduced.

Responsibility: Community Development Department

Program N 2.1-d: Establish a standard for new commercial development adjacent to residential areas which does not permit an increase in noise levels in residential areas of more than 3 dB Ldn, or create noise impacts which would increase noise levels to more than 60 dB Ldn at the boundary of a residential area, whichever is the more restrictive standard.

Responsibility: Community Development Department

Policy N 2.2: Noise Reduction in Existing Residential Areas. Reduce noise levels in existing residential areas.

Program N 2.2-a: Restrict truck traffic to designated routes.

Responsibility: Community Development and Public Works Departments

Program N 2.2-b: Enforce California Vehicle Code § 23130, 23130.5, 27150, 27151 and 38275. These sections pertain to the allowable noise emission of vehicles operated on public streets.

Responsibility: Police Department

Program N 2.2-c: Facilitate City review of all activities that take place at the County Fairgrounds. This would allow the City to institute additional noise control measures, if it deems them necessary, and to assure that any new events brought to the fairgrounds not generate noise exceeding the Noise and Land Use Compatibility Standards contained in Table 15.

Responsibility: Community Development Department

Program N 2.2-d: The City should work in a cooperative manner with the County and State to explore options for mitigating noise impacts from the Fairgrounds.

Responsibility: City Council

Program N 2.2-e: Consult with the State and the County regarding activity on the lake. The City's concerns regarding early morning starts for events such as bass tournaments should be stated to the agency in charge of permits for the activities, so that adequate controls on hours of operation (muffler use, etc.) can be instituted to reduce noise.

Responsibility: Community Development Department

Policy N 2.3: Interagency Cooperation. Continue to encourage other agencies to reduce noise levels generated by airports, heliports, roadways and other facilities.

Program N 2.3-a: Continue to work with the County and the Airport Land Use Commission to reduce noise generated from Lampson Field.

Responsibility: Community Development Department and the County Public Works Department

Policy N 2.4: Discourage Sound Walls. As an alternative to the construction of sound walls to mitigate noise levels, encourage developers to utilize site design techniques, vegetative landscaping, berms, building setbacks, and alternative architectural layouts as a means of meeting noise reduction requirements. Where sound walls are deemed appropriate, design standards shall be applied to reduce visual and aesthetic impacts.

Program N 2.4-a: Amend the zoning ordinance to include standards for construction of sound walls and alternative forms of noise mitigation.

OBJECTIVE N 3: TO PREVENT LAND USES WHICH INCREASE THE EXISTING NOISE LEVEL ABOVE ESTABLISHED ACCEPTABLE STANDARDS.

Policy N 3.1: Remodel Projects. Noise standards shall be applied to residential remodel projects, where the remodeling is substantial.

Program N 3.1-a: Review all building permit applications for compliance with the applicable noise standards, and require as necessary, the appropriate noise mitigating features.

Responsibility: Community Development and Building Departments

Policy N 3.2: Noise Protection in Residential Areas. Protect existing noise environment in residential areas.

Program N 3.2-a: Require mitigation measures for projects that would cause the following criteria to be exceeded or would generate noise which could cause significant adverse community response:

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- Cause the Ldn in existing residential areas to increase by 3 dB or more and exceed an Ldn of 55 dB.
 - Cause the Ldn in existing residential areas to increase by 3 dB or more if the Ldn currently exceeds 55 dB.

[Note: a 3 dB increase would result if traffic increased by 100% over existing levels. It is recognized that there are locations where the outdoor criteria of an Ldn of 55 dB cannot be reasonably and feasibly achieved. These situations will be evaluated on a case-by-case basis to determine the appropriate level of mitigation.]

Responsibility: Community Development and Building Departments

Program N 3.2-b: Continue to enforce the existing Lakeport Noise Ordinance.

Responsibility: Community Development and Police Departments

Program N 3.2-c: Stay abreast of changing noise issues in Lakeport and periodically review the existing Lakeport Noise Ordinance and update it as needed.