Appendix E Noise Data

Appendix

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Fundamentals of Noise

NOISE

Noise is most often defined as unwanted sound; whether it is loud, unpleasant, unexpected, or otherwise undesirable. Although sound can be easily measured, the perception of noise and the physical response to sound complicate the analysis of its impact on people. People judge the relative magnitude of sound sensation in subjective terms such as "noisiness" or "loudness."

Noise Descriptors

The following are brief definitions of terminology used in this chapter:

- **Sound.** A disturbance created by a vibrating object, which, when transmitted by pressure waves through a medium such as air, is capable of being detected by a receiving mechanism, such as the human ear or a microphone.

- **Noise.** Sound that is loud, unpleasant, unexpected, or otherwise undesirable.

- **Decibel (dB).** A unitless measure of sound, expressed on a logarithmic scale and with respect to a defined reference sound pressure. The standard reference pressure is 20 micropascals (20 μPa).

- **Vibration Decibel (VdB).** A unitless measure of vibration, expressed on a logarithmic scale and with respect to a defined reference vibration velocity. In the U.S., the standard reference velocity is 1 micro-inch per second ($1x10^{-6}$ in/sec).

- **A-Weighted Decibel (dBA).** An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.

- **Equivalent Continuous Noise Level (L_{eq}); also called the Energy-Equivalent Noise Level.** The value of an equivalent, steady sound level which, in a stated time period (often over an hour) and at a stated location, has the same A-weighted sound energy as the time-varying sound. Thus, the L_{eq} metric is a single numerical value that represents the equivalent amount of variable sound energy received by a receptor over the specified duration.

- **Statistical Sound Level (L_n).** The sound level that is exceeded "n" percent of time during a given sample period. For example, the L_{50} level is the statistical indicator of the time-varying noise signal that is exceeded 50 percent of the time (during each sampling period); that is, half of the sampling time, the changing noise levels are above this value and half of the time they are below it. This is called the "median sound level." The L_{10} level, likewise, is the value that is exceeded 10 percent of the time (i.e., near the maximum) and this is often known as the "intrusive sound level." The L_{90} is the sound level exceeded 90 percent of the time and is often considered the "effective background level" or "residual noise level."

- **Day-Night Sound Level (L_{dn} or DNL).** The energy-average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the sound levels occurring during the period from 10:00 PM to 7:00 AM.

- **Community Noise Equivalent Level (CNEL).** The energy average of the A-weighted sound levels occurring during a 24-hour period, with 5 dB added from 7:00 PM to 10:00 PM and 10 dB from 10:00 PM to 7:00 AM. NOTE: For general community/environmental noise, CNEL and L_{dn} values rarely differ by more than 1 dB (with the CNEL being only slightly more restrictive – that is, higher than the L_{dn} value). As a matter of practice, L_{dn} and CNEL values are interchangeable and are treated as equivalent in this assessment.

- **Sensitive Receptor.** Noise- and vibration-sensitive receptors include land uses where quiet environments are necessary for enjoyment and public health and safety. Residences, schools, motels and hotels, libraries, religious institutions, hospitals, and nursing homes are examples.

Characteristics of Sound

When an object vibrates, it radiates part of its energy in the form of a pressure wave. Sound is that pressure wave transmitted through the air. Technically, airborne sound is a rapid fluctuation or oscillation of air pressure above and below atmospheric pressure that creates sound waves.

Sound can be described in terms of amplitude (loudness), frequency (pitch), or duration (time). Loudness or amplitude is measured in dB, frequency or pitch is measured in Hertz [Hz] or cycles per second, and duration or time variations is measured in seconds or minutes.

Amplitude

Unlike linear units such as inches or pounds, decibels are measured on a logarithmic scale. Because of the physical characteristics of noise transmission and perception, the relative loudness of sound does not closely match the actual amounts of sound energy. Table 1 presents the subjective effect of changes in sound pressure levels. Ambient sounds generally range from 30 dBA (very quiet) to 100 dBA (very loud). Changes of 1 to 3 dB are detectable under quiet, controlled conditions, and changes of less than 1 dB are usually not discernible (even under ideal conditions). A 3 dB change in noise levels is considered the minimum change that is detectable with human hearing in outside environments. A change of 5 dB is readily discernible to most people in an exterior environment, and a 10 dB change is perceived as a doubling (or halving) of the sound.

Table 1 Noise Perceptibility

Change in dB	Noise Level
± 3 dB	Threshold of human perceptibility
± 5 dB	Clearly noticeable change in noise level
± 10 dB	Half or twice as loud
± 20 dB	Much quieter or louder

Source: Bies, David A. and Colin H. Hansen. 2009. *Engineering Noise Control: Theory and Practice*. 4th ed. New York: Spon Press.

Frequency

The human ear is not equally sensitive to all frequencies. Sound waves below 16 Hz are not heard at all, but are "felt" more as a vibration. Similarly, though people with extremely sensitive hearing can hear sounds as high as 20,000 Hz, most people cannot hear above 15,000 Hz. In all cases, hearing acuity falls off rapidly above about 10,000 Hz and below about 200 Hz.

When describing sound and its effect on a human population, A-weighted (dBA) sound levels are typically used to approximate the response of the human ear. The A-weighted noise level has been found to correlate well with people's judgments of the "noisiness" of different sounds and has been used for many years as a measure of community and industrial noise. Although the A-weighted scale and the energy-equivalent metric are commonly used to quantify the range of human response to individual events or general community sound levels, the degree of annoyance or other response also depends on several other perceptibility factors, including:

- Ambient (background) sound level
- General nature of the existing conditions (e.g., quiet rural or busy urban)
- Difference between the magnitude of the sound event level and the ambient condition
- Duration of the sound event
- Number of event occurrences and their repetitiveness
- Time of day that the event occurs

Duration

Time variation in noise exposure is typically expressed in terms of a steady-state energy level equal to the energy content of the time varying period (called L_{eq}), or alternately, as a statistical description of the sound level that is exceeded over some fraction of a given observation period. For example, the L_{50} noise level represents the noise level that is exceeded 50 percent of the time; half the time the noise level exceeds this level and half the time the noise level is less than this level. This level is also representative of the level that is exceeded 30 minutes in an hour. Similarly, the L_2, L_8 and L_{25} values represent the noise levels that are exceeded 2, 8, and 25 percent of the time or 1, 5, and 15 minutes per hour, respectively. These "n" values are typically used to demonstrate compliance for stationary noise sources with many cities' noise ordinances. Other values typically noted during a noise survey are the L_{min} and L_{max}. These values represent the minimum and maximum root-mean-square noise levels obtained over the measurement period, respectively.

Because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, state law and many local jurisdictions use an adjusted 24-hour noise descriptor called the Community Noise Equivalent Level (CNEL) or Day-Night Noise Level (L_{dn}). The CNEL descriptor requires that an artificial increment (or "penalty") of 5 dBA be added to the actual noise level for the hours from 7:00 PM to 10:00 PM and 10 dBA for the hours from 10:00 PM to 7:00 AM. The L_{dn} descriptor uses the same methodology except that there is no artificial increment added to the hours between 7:00 PM and 10:00 PM. Both descriptors give roughly the same 24-hour level, with the CNEL being only slightly more restrictive (i.e., higher). The CNEL or L_{dn} metrics are commonly applied to the assessment of roadway and airport-related noise sources.

Sound Propagation

Sound dissipates exponentially with distance from the noise source. This phenomenon is known as "spreading loss." For a single-point source, sound levels decrease by approximately 6 dB for each doubling of distance from the source (conservatively neglecting ground attenuation effects, air absorption factors, and barrier shielding). For example, if a backhoe at 50 feet generates 84 dBA, at 100 feet the noise level would be 79 dBA, and at 200 feet it would be 73 dBA. This drop-off rate is appropriate for noise generated by on-site operations from stationary equipment or activity at a project site. If noise is produced by a line source, such as highway traffic, the sound decreases by 3 dB for each doubling of distance over a reflective ("hard site") surface such as concrete or asphalt. Line source noise in a relatively flat environment with ground-level absorptive vegetation decreases by an additional 1.5 dB for each doubling of distance.

Psychological and Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects the entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions, thereby affecting blood pressure and functions of the heart and the nervous system. Extended periods of noise exposure above 90 dBA results in permanent cell damage, which is the main driver for employee hearing protection regulations in the workplace. For community environments, the ambient or background noise problem is widespread, through generally worse in urban areas than in outlying, less-developed areas. Elevated ambient noise levels can result in noise interference (e.g., speech interruption/masking, sleep disturbance, disturbance of concentration) and cause annoyance. Since most people do not routinely work with decibels or A-weighted sound levels, it is often difficult to appreciate what a given sound pressure level number means. To help relate noise level values to common experience, Table 2 shows typical noise levels from familiar sources.

Table 2 Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Onset of physical discomfort	120+	
	110	Rock Band (near amplification system)
Jet Flyover at 1,000 feet		
	100	
Gas Lawn Mower at three feet		
	90	
Diesel Truck at 50 feet, at 50 mph		Food Blender at 3 feet
	80	Garbage Disposal at 3 feet
Noisy Urban Area, Daytime		
	70	Vacuum Cleaner at 10 feet
Commercial Area		Normal speech at 3 feet
Heavy Traffic at 300 feet	60	
		Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (background)
Quiet Suburban Nighttime		
	30	Library
Quiet Rural Nighttime		Bedroom at Night, Concert Hall (background)
	20	
		Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: California Department of Transportation (Caltrans). 2009, November. Technical Noise Supplement ("TeNS"). Prepared by ICF International.

Vibration Fundamentals

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration is normally associated with activities stemming from operations of railroads or vibration-intensive stationary sources, but can also be associated with construction equipment such as jackhammers, pile drivers, and hydraulic hammers. As with noise, vibration can be described by both its amplitude and frequency. Vibration displacement is the distance that a point on a surface moves away from its original static position; velocity is the instantaneous speed that a point on a surface moves; and acceleration is the rate of change of the speed. Each of these descriptors can be used to correlate vibration to human response, building damage, and acceptable equipment vibration levels. During construction, the operation of construction equipment can cause groundborne vibration. During the operational phase of a project, receptors may be subject to levels of vibration that can cause annoyance due to noise generated from vibration of a structure or items within a structure.

Vibration amplitudes are usually described in terms of either the peak particle velocity (PPV) or the root mean square (RMS) velocity. PPV is the maximum instantaneous peak of the vibration signal and RMS is the

square root of the average of the squared amplitude of the signal. PPV is more appropriate for evaluating potential building damage and RMS is typically more suitable for evaluating human response.

As with airborne sound, annoyance with vibrational energy is a subjective measure, depending on the level of activity and the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Persons accustomed to elevated ambient vibration levels, such as in an urban environment, may tolerate higher vibration levels. Table 3 displays the human response and the effects on buildings resulting from continuous vibration (in terms of various levels of PPV).

Table 3 Human Reaction to Typical Vibration Levels

Vibration Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.006–0.019	Threshold of perception, possibility of intrusion	Vibrations unlikely to cause damage of any type
0.08	Vibrations readily perceptible	Recommended upper level of vibration to which ruins and ancient monuments should be subjected
0.10	Level at which continuous vibration begins to annoy people	Virtually no risk of "architectural" (i.e. not structural) damage to normal buildings
0.20	Vibrations annoying to people in buildings	Threshold at which there is a risk to "architectural" damage to normal dwelling – houses with plastered walls and ceilings
0.4–0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage

Source: California Department of Transportation (Caltrans). 2004, June. Transportation- and Construction-Induced Vibration Guidance Manual. Prepared by ICF International.

LOCAL REGULATIONS

NOISE ELEMENT

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INTRODUCTION TO THE ELEMENT

The control of noise is an essential part of preserving the quality of a community. The development of effective strategies to reduce excessive noise in the community resulting from mobile sources such as traffic, aircraft, rail, and stationary sources, such as construction activity, music and air conditioners is essential to creating a safe and compatible living and working environment. Since 1971, the noise element has been mandatory in a California general plan. Due to California's rapid growth, a noise element is required by the state to enable communities to limit exposure to excessive noise levels. The Noise Element Technical Memorandum provides the necessary background information and supporting documentation for this element.

PURPOSE OF THE NOISE ELEMENT

The Noise Element of a General Plan is a comprehensive approach for including noise control in the planning process. It is a tool for achieving and maintaining environmental noise levels compatible with land use. The Noise Element identifies noise sensitive land uses and noise sources, and defines areas of noise impact. The element establishes goals, policies, and programs to ensure that Tustin residents will be protected from excessive noise.

RELATED PLANS AND PROGRAMS

There are several existing plans and programs that are directly applicable to the aims and objectives of this Element. These plans and programs have been enacted through State and local legislation and are administered by agencies that are delegated with powers to enforce State and local laws.

California Environmental Quality Act Law and Guidelines

The State legislature adopted the California Environmental Quality Act (CEQA) in response to a public mandate that called for a thorough environmental analysis of those projects that might adversely affect the environment. The CEQA law and guidelines describe the provisions of the law, the review procedure, and any subsequent analysis that is required. CEQA recognizes that excessive noise

associated with certain types of public and private projects represents an environmental impact that must be avoided or reduced. CEQA will continue to be instrumental in ensuring that City officials and the general public assess the potentially significant noise impacts of development projects.

California Noise Insulation Standards (Title 24)

The California Commission of Housing and Community Development officially adopted the noise insulation standards in 1974 and they became effective on August 22, 1974. On November 14, 1988, the Building Standards Commission approved revisions to these standards (Title 24, Part 2, California Code of Regulations). The revisions state that "Interior noise levels attributable to exterior sources shall not exceed 45 dB in any habitable room. The noise metric shall be either . . . Ldn or . . . CNEL, consistent with the noise element of the local general plan." Additionally, the commission specifies that residential buildings or structures to be located within exterior CNEL (or Ldn) contours of 60 dB or greater of an existing or adopted freeway, expressway, parkway, major street, thoroughfare, rail line, rapid transit line, or industrial noise source shall require an acoustical analysis showing that the building has been designed to limit intruding noise to an interior CNEL (or Ldn) of 45 dB.

City of Tustin Noise Ordinance/Conditions of Approval

The City's noise ordinance, permitted by the State of California Health and Safety Code, provides a basis for controlling excessive and annoying noise from stationary sources such as construction activity, industrial plants, pumps, compressors, refrigeration units, etc. The ordinance provides specific noise standards to be applied for various land uses for both daytime and nighttime hours, prohibits certain noise sources, and describes the manner in which the noise standards are to be enforced.

Where applicable, the City routinely applies several noise-related conditions of approval to a development before issuing building permits. These conditions identify the proposed project as located in a noise impact area and require that mitigation be provided as necessary to ensure compliance with the City's noise exposure standards.

SCOPE AND CONTENT OF THE ELEMENT

The Noise Element follows the State guidelines prepared by the Office of Noise Control, State Department of Health as a result of Senate Bill 860(A) (effective January 1, 1976). The element quantifies the community noise environment in terms of noise exposure contours for both near- and long-term levels of growth and noise-generating activity. The information is a guideline for the development of goals and policies to achieve noise compatible land uses. In addition to the Introduction, the Element is divided into four sections: Summary of Issues, Needs, Opportunities, and Constraints; Goals and Policies; the Noise Plan, and the Implementation Program.

RELATIONSHIP TO OTHER GENERAL PLAN ELEMENTS

The Tustin General Plan consists of seven different elements. All of the elements – Land Use, Circulation, Housing, Conservation/Open – are related to the Noise Element.

When integrated with the Noise Element, the Land Use Element will show land uses in relation to existing and projected noise contours. In this way, compatible and incompatible land uses may be identified. The Noise Element relates to the Circulation Element since the circulation system is the primary source of noise throughout the planning area. Noise exposure will be a factor in the location and design of new arterials, and the mitigation of noise from existing arterials in relation to existing and planned land uses.

Since residential land use is noise sensitive, the information provided in the Noise Element will need to be considered in the planning of future housing developments, as discussed in the Housing Element. The Noise Element also relates to the Open Space/Conservation/ Recreation Element since excessive noise can have a detrimental impact on the enjoyment of open spaces. Therefore, the information provided in the Noise Element needs to be considered in planning for this type of land use. In addition, open space areas can be used as a buffer to mitigate noise levels at more noise-sensitive residential areas.

Excessive noise can also be detrimental to a person's health or cause hearing loss over long periods of time. Therefore, the Noise Element

will need to be considered in the Public Safety Element when assessing occupational environments, and the noise exposure levels at noise-sensitive areas (residential, parks, schools, libraries, and hospitals).

Finally, growth within the planning area will result in increased housing, increased use of the circulation system and increased noise levels. The Noise Element will need to be considered in the Growth Management Element when planning future developments.

SUMMARY OF ISSUES, NEEDS, OPPORTUNITIES AND CONSTRAINTS

This section summarizes the noise-related issues, needs, opportunities, and constraints for the Tustin Planning Area. These will form the basis for the Noise Element goals and policies.

TRANSPORTATION NOISE CONTROL

- The City of Tustin can exercise little control over flight operations at John Wayne Airport.
- Noise from John Wayne Airport, while generally below accepted CNEL guidelines for residential uses, produces annoyance among Tustin residents due to repetitive occurrence.
- The activities and opportunities at John Wayne Airport should be monitored as needed to protect the planning area from unwanted aircraft noise.
- Citizen involvement in committees that will influence future aircraft operations at John Wayne Airport needs to be encouraged.
- Outside agencies exercise responsibility for noise associated with the freeways and railroads.
- Many residential neighborhoods are located next to heavily traveled arterials, some of which are exposed to "unacceptable" ambient noise levels as defined by the State Office of Noise Control.
- The Tustin Planning Area is bisected by two major freeway corridors - the I-5 and SR-55 - resulting in significant traffic noise levels.
- Increases in traffic volumes will increase noise levels throughout Tustin.

- Noise from train movements and whistles on the Southern California Rail Authority (SCRRA) rail line significantly affects nearby residences.

NOISE AND LAND USE PLANNING INTEGRATION

- Availability of manpower and expertise needed to perform noise measurements and to identify noise control measures in the enforcement of city, state and federal laws is limited.

- Noise control measures and noise-related compatibility considerations need to be included in all new land use developments.

- Enforcement of city, state and federal requirements regarding noise control is necessary, specifically: The City's noise ordinance regarding intrusive noise, the state vehicle code and provisions regarding mufflers and excessively loud radios, the state noise insulation standards for multifamily developments, and the federal and state requirements regarding noise control in work places.

- Many commercial and residential uses in Tustin are located near one another, creating potential noise conflicts between these uses.

- Trucking operations and mechanical equipment associated with commercial/industrial activities impact nearby residences.

- The introduction of mixed-use zones that integrate residences above ground floor commercial uses presents potential noise conflicts from both traffic noise generated from the frontage street and noise generated from ground floor commercial activity.

- The noise impact of construction activity adversely affects residences when carried on for long periods of time, and on the weekends and in the evenings.

- As in most urban settings, Tustin's residents are subject to noise from nuisances such as lawn mowers, leaf blowers, radios, parties and sporting events.

NOISE ELEMENT GOALS AND POLICIES

A substantial portion of the City is affected by various sources of noise. The following goals and policies are intended to address identified noise issues in the community.

TRANSPORTATION NOISE CONTROL

Transportation-related activities are primary sources of noise affecting the quality of life in Tustin. Effective reduction of noise associated with transportation is necessary to ensure protection from the detrimental effects of excessive noise.

GOAL 1: Use noise control measures to reduce the impact from transportation noise sources.

Policy 1.1: Pursue construction of new barriers, or the augmentation of existing barriers, to reduce noise impacts along the Route 5 and Route 55 freeways along segments directly next to residential areas.

Policy 1.2: Intentionally omitted

Policy 1.3: Encourage John Wayne Airport to set up noise control procedures and to consider methods to reduce and minimize noise exposure due to aircraft flyovers within the Tustin Planning Area.

Policy 1.4: Continue to monitor all John Wayne Airport activities to minimize noise impacts within the Tustin Planning Area resulting from airport operations, and oppose legislation promulgated by the FAA that could eliminate local flight restrictions.

Policy 1.5: Work to reduce risks and noise impacts resulting from aircraft operations by (a) participating in and monitoring the planning process for John Wayne Airport and (b)continuing to discourage commercial or general aviation activities which increase noise exposure.

Policy 1.6: Encourage Tustin citizen participation and City involvement on committees that would influence future aircraft operations in Orange County.

Policy 1.7: Encourage construction of noise barriers by the Public Utilities Commission, Southern California Regional Rail Authority, Amtrak, and Orange County Transportation Authority along the Atchison, Topeka and Santa Fe rail line where residences exist next to the tracks.

Policy 1.8: Encourage the Public Utilities Commission, Southern California Regional Rail Authority, Amtrak, and the Orange County Transportation Authority to minimize the level of noise produced by train movements and whistle noise within the Planning Area by reducing speeds, improving vehicle system technology and developing improved procedures for train engineer whistle blowing.

Policy 1.9: Encourage, where feasible, noise mitigation measures, such as noise barriers and realignments, in the design and construction of new roadway projects in the Tustin Planning Area.

Policy 1.10: Enforce the State's Vehicle Code noise standards within the City.

Policy 1.11: Consider noise impacts to residential neighborhoods when designating truck routes and major circulation corridors.

Policy 1.12: Work with the Orange County Transportation Agency to establish bus routes that meet public transportation needs and minimize noise impacts in residential areas.

NOISE AND LAND USE PLANNING INTEGRATION

Consideration of the effects of noise early in the land use planning process can minimize or avoid detrimental impacts.

GOAL 2: Incorporate noise considerations into land use planning decisions.

Policy 2.1: Adopt planning guidelines that establish acceptable noise standards for various land uses throughout the Tustin Planning Area.

Policy 2.2: Apply the state's noise insulation standards to the conversion of existing apartments into condominiums wherever feasible.

Policy 2.3: Use noise/land use compatibility standards as a guide for future planning and development.

Policy 2.4: Review proposed projects in terms of compatibility with nearby noise-sensitive land uses with the intent of reducing noise impacts.

Policy 2.5: Require new residential developments located in proximity to existing commercial/industrial operations to control residential interior noise levels as a condition of approval.

Policy 2.6: Require that commercial uses developed as part of a mixed-use project (with residential) not be noise intensive. Design mixed-use structures to prevent transfer of noise from the commercial to the residential use.

Policy 2.7: Require new commercial/industrial operations located in proximity to existing or proposed residential areas to incorporate noise mitigation into project design.

Policy 2.8: Replace a significant noise source with non-noise generating land uses when plans for future use of areas are developed.

NON-TRANSPORTATION NOISE CONTROL

Sources of noise that are not related to transportation can be controlled to avoid exposure to excessive noise levels.

GOAL 3: Develop measures to control non-transportation noise impacts.

Policy 3.1: Implement a review process of Tustin's noise ordinance, and City policies and regulations affecting noise.

Policy 3.2: Minimize the impacts of construction noise on adjacent land uses through limiting the permitted hours of activity.

Policy 3.3: Require City departments to observe state and federal occupational safety and health noise standards.

Policy 3.4: Require new equipment and vehicles purchased by the City to comply with noise performance standards consistent with available noise reduction technology.

RELATED GOALS AND POLICIES

Goals and policies of the other General Plan Elements also relate to issues addressed in the Noise Element. To ensure internal consistency, Table N-1 lists each element, noise issues, and the goals and policies that relate to both.

TABLE N-1
NOISE RELATED GOALS AND POLICIES BY ELEMENT

Noise Issue Area	Land Use	Housing	Circulation	Noise	Conservation/ Open Space/ Recreation	Public Safety	Growth Manage-ment
Transportation Noise Control			3.2				
Noise and Land Use Planning Integration	13.1		1.13				
Non-Transportation Noise Control							

THE NOISE PLAN

To achieve the goals and objectives of the Noise Element, an effective Noise Plan implementation program developed within the constraints of the City's financial and staffing capabilities is necessary. The purpose is to reduce the number of people exposed to excessive noise and to minimize the future effect of noise in the City.

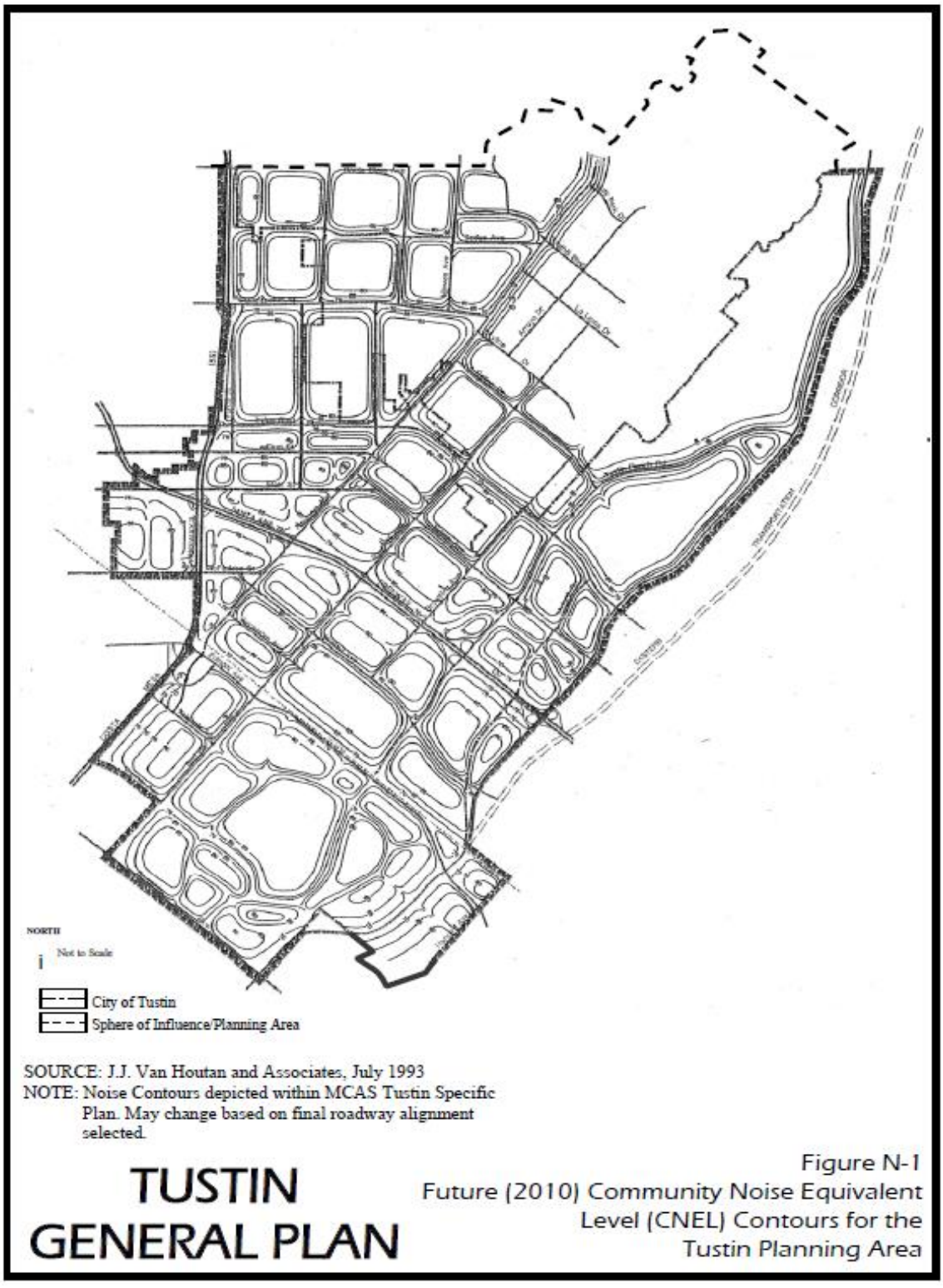
COMMUNITY NOISE CONTOURS

The noise environment for the Tustin Planning Area can be described using noise contours developed for the major noise sources within the area. Noise contours represent lines of equal noise exposure. Figure N-1 presents the noise contours for the Tustin Planning Area for Land Use Policy Map buildout conditions. The contours shown on the maps range from a CNEL of 60 dB to 80 dB for aircraft, train, and traffic noise. Full size exhibits (scale: 1"=800') are available for inspection at the Community Development Department.

The noise contours for the Tustin Planning Area were developed based upon existing and future traffic conditions, train operations and environmental conditions. The assumptions and methods used to develop the contours are explained in detail in the Technical Memorandum.

Noise Impact Areas

The noise contours are used as a guide for planning. The 60 dB CNEL contour defines the noise impact area. Any proposed new noise sensitive land use (i.e., residential, hospitals, schools and churches) within this area shall be evaluated on a project specific basis to meet City or State (Title 24) standards. An acoustical analysis prepared by a qualified acoustical engineer, should be required in these Noise Impact Areas for all noise sensitive land uses verifying that the structure has been designed or mitigation measures proposed to limit intruding noise to the prescribed allowable levels.



SOURCE: J.J. Van Houtan and Associates, July 1993
NOTE: Noise Contours depicted within MCAS Tustin Specific Plan. May change based on final roadway alignment selected.

TUSTIN GENERAL PLAN

Figure N-1
Future (2010) Community Noise Equivalent Level (CNEL) Contours for the Tustin Planning Area

Areas of Special Concern

Areas of special concern within the Noise Impact Area are near the I-5 and SR-55 freeways. At these locations the existing CNEL ranges from 70 to 80dB. Caltrans constructed sound walls along these freeways as part of the freeway widening projects. These walls reduce the CNEL at the adjacent residences.

Residences next to a number of major and secondary arterials in the Tustin Planning Area are also exposed to a CNEL over 65 dB. These arterials include:

- Bryan Avenue
- Fairhaven Avenue
- Newport Avenue
- Yorba Street
- Browning Avenue
- El Camino Real
- Walnut Avenue
- Edinger Street
- Irvine Boulevard
- Red Hill Avenue
- Prospect Avenue
- 17th Street
- McFadden Street
- Sycamore Avenue

Measurements have shown that residences located next to the Southern California Regional Rail Authority (SCRRA) rail line are were exposed to a CNEL of about 70 dB and maximum noise levels of 78 dB(A). By the year 2010, the CNEL at the adjacent residences will increase by as much as 6 dB due to increased rail activity related to commuter rail activities along the SCRRA/OCTA railway (Metrolink). The primary source of annoyance at these locations will be afternoon and early morning peak hour train passes.

LAND USE COMPATIBILITY GUIDELINES AND STANDARDS

Table N-2 provides guidance for the acceptability of certain development projects within specific CNEL contours and will act as a set of criteria for assessing the compatibility of proposed land uses within the noise environment.

Land Use Compatibility Guidelines are the basis for development of the specific noise standards presented in table N-3 which should be utilized as city policy related to new land uses and acceptable noise levels development.

For the City to achieve noise and land use compatibility it is imperative that mitigation measures be imposed during site planning to mitigate anticipated noise impacts on affected noise sensitive land uses. The submittal of an acoustical analysis report in noise impact levels is one mechanism to evaluate proposed projects. The incorporation of mitigation measures as described in this Noise Plan and other action may enable a project to comply with exterior and interior noise compatibility guidelines and standards.

Construction Standards

The provisions of the State of California Noise Insulation Standards (California Administrative Code, Title 24) specifying that the indoor noise levels for multifamily residential living spaces shall not exceed 45 dB CNEL (or Ldn) due to the combined effect of all noise sources will be enforced. The State requires implementation of this standard when the outdoor noise levels exceed 60 dB CNEL (or Ldn). The noise contour maps can be used to decide when this standard needs to be addressed. The code requires that this standard be applied to all new hotels, motels, apartment houses and dwellings, other than detached single family dwellings. The City will also, as a matter of policy, apply this standard to new single family developments and condominium conversion projects where feasible.

The noise levels presented in Table N-2 represent exterior noise levels. The primary purpose of the noise compatibility matrix is to identify potential conflicts between proposed land uses and the noise environment. The matrix is usually used at the General Plan or zoning level of approvals. If a project falls within Zone A or Zone B the project is considered compatible with the noise environment. Zone A implies that no mitigation will be needed. Zone B implies that minor soundproofing of the structure may be needed and should be engineered before issuance of building permits. Zone C shows that substantial noise mitigation will be necessary, such as construction of noise barriers and substantial building sound insulation. However, projects in Zone C can be successfully mitigated. The project may be approved for land use and then is mitigated as necessary to achieve City standards (Table N-3) before issuance of building permits or other appropriate milestones.

TRANSPORTATION NOISE CONTROL

The most efficient and effective means of controlling noise from transportation systems is to reduce noise at the source.

However, since the City has little direct control over source noise levels because of state and federal preemption (i.e., State motor vehicle noise standards and Federal air regulations), programs should be focused on reducing the impact of the noise on the community. Cooperative efforts with state and federal offices are essential.

Within the Tustin Planning Area are several transportation related noise sources including train tracks, two freeways, major arterials, collector roadways, and a commercial airport. Although MCAS Tustin closed in 1999, blimp flight operations may occur as an interim use. These sources are the major contributors of noise in Tustin. Cost effective strategies to reduce their influence on the community noise environment are an essential part of the Noise Element.

TABLE N-2
LAND USE NOISE COMPATIBILITY MATRIX

LAND USE CATEGORIES		COMMUNITY NOISE EQUIVALENT LEVEL CNEL						
CATEGORIES	USES	<55	60	65	70	75	80>	
RESIDENTIAL	Single Family, Duplex, Multiple Family	A	A	B	C	C	D	D
RESIDENTIAL	Mobile Home	A	A	B	C	C	D	D
COMMERCIAL Regional, District	Hotel, Motel, Transient Lodging	A	A	B	B	C	C	D
COMMERCIAL Regional, Village District, Special	Commercial Retail, Bank, Restaurant, Movie Theater	A	A	A	A	B	B	C
COMMERCIAL INDUSTRIAL INSTITUTIONAL	Office Building, Research and Development, Professional Offices, City Office Building	A	A	A	B	B	C	D
COMMERCIAL Recreation INSTITUTIONAL Civic Center	Amphitheater, Concert Hall Auditorium, Meeting Hall	B	B	C	C	D	D	D
COMMERCIAL Recreation	Children's Amusement Park, Miniature Golf Course, Go-cart Track, Equestrian Center, Sports Club	A	A	A	B	B	D	D
COMMERCIAL General, Special INDUSTRIAL, INSTITUTIONAL	Automobile Service Station, Auto Dealership, Manufacturing, Warehousing, Wholesale, Utilities	A	A	A	A	B	B	B
INSTITUTIONAL General	Hospital, Church, Library, Schools' Classroom	A	A	B	C	C	D	D
OPEN SPACE	Parks	A	A	A	B	C	D	D
OPEN SPACE	Golf Course, Cemeteries, Nature Centers Wildlife Reserves, Wildlife Habitat	A	A	A	A	B	C	C
AGRICULTURE	Agriculture	A	A	A	A	A	A	A

INTERPRETATION	
ZONE A CLEARLY COMPATIBLE	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.
ZONE B NORMALLY COMPATIBLE	New construction or development should be undertaken only after detailed analysis of the noise reduction requirements are made and needed noise insulation features in the design are determined. Conventional construction, with closed windows and fresh air supply systems or air conditioning, will normally suffice.
ZONE C NORMALLY INCOMPATIBLE	New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design
ZONE D CLEARLY INCOMPATIBLE	New construction or development should generally not be undertaken.

Source: J.J. Van Houten & Associates

TABLE N-3
INTERIOR AND EXTERIOR NOISE STANDARDS

Land Use	Noise Standards[1]	
	Interior[2,3]	Exterior
Residential - Single family, multifamily, duplex, mobile home	CNEL 45 dB	CNEL 65 dB[4]
Residential - Transient lodging, hotels, motels, nursing homes, hospitals	CNEL 45 dB	CNEL 65 dB[4]
Private offices, church sanctuaries, libraries, board rooms, conference rooms, theaters, auditoriums, concert halls, meeting halls, etc.	Leq(12) 45 dB(A)	-
Schools	Leq(12) 45 dB(A)	Leq(12) 67 dB(A)[5]
General offices, reception, clerical, etc.	Leq(12) 50 dB(A)	-
Bank lobby, retail store, restaurant, typing pool, etc.	Leq(12) 55 dB(A)	-
Manufacturing, kitchen, warehousing, etc.	Leq(12) 65 dB(A)	-
Parks, playgrounds	-	CNEL 65 dB[5]
Golf courses, outdoor spectator sports, amusement parks	-	CNEL 70 dB[5]

NOTES

1. CNEL: Community Noise Equivalent Level.
   Leq(12): The A-weighted equivalent sound level averaged over a 12-hour period (usually the hours of operation).
2. Noise standard with windows closed. Mechanical ventilation shall be provided per UBC requirements to provide a habitable environment.
3. Indoor environment excluding bathrooms, toilets, closets and corridors.
4. Outdoor environment limited to rear yard of single family homes, multifamily patios and balconies (with a depth of 6' or more) and common recreation areas.
5. Outdoor environment limited to playground areas, picnic areas, and other areas of frequent human use.

Noise Barriers

The most effective method for mitigating transportation noise is through reducing the impact of the noise onto the community by utilizing the site design review process and the California Environmental Quality Act. Mitigation through site planning, landscaping, as well as topography, and the design and construction of a noise barrier (wall, berms, or combination wall/berms) are the most common ways of alleviating traffic noise impacts in existing urban environments. Setbacks can also be used to provide partial mitigation or full mitigation where a small noise reduction is needed.

Noise attenuating barriers are commonly incorporated into projects and can be extremely effective in reducing noise levels. The effectiveness of the barrier depends on the relative height and materials of the barrier, the noise source, the affected area, the horizontal distance between the source and the barrier, and between the barrier and the affected area. Although noise barriers can be extremely effective, their aesthetic effect on a neighborhood should be considered.

Noise mitigation measures should be included in the design of roadway improvement projects consistent with funding capability. Efforts by the California Department of Transportation, the Orange County Transportation Agency and others to provide for acoustical protection of existing noise sensitive land uses affected by these projects will be supported by the City, and consideration of soundwalls will be requested to mitigate significant adverse impacts as part of any Caltrans and OCTA roadway projects. The Route 5 and 55 freeways, and the proposed Eastern Transportation Corridor are primary candidate projects for the inclusion of barriers to reduce noise impact.

The use of walls and berms in the design of new residential and other noise sensitive land uses that are next to major roads, rail lines, commercial, or industrial areas may be extremely helpful in mitigating noise impacts. The City will also encourage the reduction of train noise by requesting that the Southern California Regional Rail Authority, OCTA and Amtrak reduce speed and use welded track in good repair throughout the Planning Area.

Noise Control At The Source

The California Vehicle Code contains noise limits applicable to new vehicles at the time of manufacture and noise regulations pertaining to the operation of all vehicles on public roads.

The City will provide for continued evaluation and enforcement of truck and bus movements and routes to minimize noise at the source for sensitive land uses. Regulation of traffic flow can also significantly minimize noise impacts. The State Motor Vehicle noise standards for cars, trucks, and motorcycles will be enforced through coordination with the California Highway Patrol and the Tustin Police.

The City and its citizens will also participate in the planning process for John Wayne Airport. Any changes in operations or land uses within the facility that will increase noise exposures in the Planning Area will be opposed. The City will encourage implementation of procedures that will reduce noise levels in the area and will minimize the number of aircraft overflights.

NON-TRANSPORTATOIN NOISE CONTROL

People, and noise sensitive areas, must be protected from excessive noise generated by non-transportation sources including commercial and industrial centers. These impacts are most effectively controlled through the environmental and site plan review process by imposition of mitigation measures and the application of a City Noise Ordinance.

Typical Mitigation for Industrial and Commercial Uses

Consideration should be given to the control of noise in new commercial and industrial developments when noise levels would otherwise be generated that would exceed the noise level for the district in which they are located and that would adversely affect nearby projects. The following mitigation measures could be applied when reviewing these new projects:

- **Furnaces** - Acoustically treat natural draft and/or forced draft units and combustion air intake plena. Insulation of firing walls and damped and lined ducting are but a few of the treatments that could be considered.

- **Fans** - Air cooled heat exchangers can be provided with silencers where effective (i.e., primarily on small, high-speed

air fans). For larger coolers, quieter equipment can be installed.

- **Motors** - Quiet-design motors can be employed and located to minimize impacts on nearby properties.

- **Centrifugal Compressors** - Centrifugal compressors can be equipped with inlet and discharge silencers. Acoustical enclosures may also be considered.

- **Centrifugal Pumps** - Centrifugal pumps may be equipped with suction and discharge piping that has been acoustically treated. Acoustical enclosures may be considered.

- **Steam and Gas Generators** - Acoustical enclosures for turbines may be effective in reducing noise. Inlet and discharge piping may be acoustically treated and expansion joints added or comparable attenuative modifications made to minimize structure-borne vibrations.

- **Control Valves** - Quiet valves should be used whenever available. In other circumstances, in-line silencers can be employed.

- **Atmospheric Vents, Exhaust and Intakes** - Noisy vents should be equipped with silencers. Where safety is not an overriding concern, vents should be positioned close to the ground or below grade.

- **Paging Systems** - Loudspeaker paging systems shall be regulated pursuant to the City's noise ordinance. Whenever possible suitable alternatives such as radio or visual paging systems should be utilized.

- **Delivery/Loading Areas** - Limit delivery hours for stores with loading areas or docks fronting, bordering, or gaining access in driveways next to noise sensitive uses.

Noise Ordinance

The City's noise ordinance will be reviewed periodically for adequacy and changes implemented as needed to address the City's current needs. The noise ordinance will continue to be enforced to ensure that adjacent properties are not exposed to excessive noise levels from stationary sources. The ordinance protects people from non-transportation related noise sources such as music, construction activity, machinery and pumps, air conditioners, and truck traffic on private property. The Community Development Department will act as noise control coordinator. This will ensure the continued operation of noise enforcement efforts of the City.

Application of the provisions of the Noise Ordinance will include: (a) requiring that any proposed development projects show compliance with the City's Noise Element and Ordinance; (b) requiring construction activity to comply with limits established in the City's Noise Ordinance; and (c) requiring all City departments to comply with the state and federal OSHA noise standards, and any new equipment or vehicle purchases to comply with city, state, and federal noise standards.

NOISE ELEMENT IMPLEMENTATION PROGRAM

The City's Noise Element provides information that is important for maintaining environmental noise levels that area compatible with existing and planned land uses. The Element addresses three primary areas: noise from transportation services, such as aircraft, freeways and major roadways; integration of information about the existing and forecasted noise environment into land use planning decisions; and noise from non-transportation sources such as commercial, industrial, and construction activities.

The City Council, by incorporating the Implementation Program into the General Plan, recognizes the importance of long-range planning considerations in day-to-day decision-making, subject to funding constraints.

TRANSPORTATION NOISE CONTROL

1. Roadway Improvement Projects: The principal method of protecting sensitive land uses from traffic noise is the construction of noise barriers in concert with road improvement projects. The City will request, where necessary to mitigate identified adverse significant noise impacts, the inclusion of soundwalls, earthern berms, or other acoustical barriers as part of any Caltrans or OCTA roadway project.

Responsible Agency/Department: Community Development, Public Works/Engineering Division

Funding Source: Various Proposition 111, Measure M, Santa Ana/Tustin TSIA, Redevelopment Agency

Time Frame: Ongoing

Related Noise Element Policies: 1.1, 1.2, 1.9, 1.12

2. Rail Line Noise Control: The principal methods of protecting sensitive land uses from rail vehicle noise are the construction of noise barriers, reduction of vehicle speed, the use of well-maintained welded track, rubberized crossings and whistle blowing procedures. The City will seek assistance from the Public Utilities Commission, Southern California Regional Rail Authority, OCTA, and Amtrak in

achieving these methods of noise protection for residential and other sensitive uses.

Responsible Agency/Department: Community Development, Public Works/Engineering

Funding Source: Public Utilities Commission, Southern California Regional Rail Authority, OCTA, Amtrak, Redevelopment Agency

Time Frame: Ongoing

Related Noise Element Policies: 1.7, 1.8

3. Vehicle Noise Control: To minimize or reduce noise impacts on residential and other sensitive land uses, the City will: 1) enforce and periodically evaluate truck and bus movements and routes to reduce impacts on sensitive areas; and 2) promote coordination between City Police and the California Highway Patrol to enforce the State Motor Vehicle noise standards.

Responsible Agency/Department: Community Development, Public Works/Engineering, Police Dept., CHP

Funding Source: City General Fund

Time Frame: Ongoing

Related Noise Element Policies: 1.1, 1.2, 1.9-1.12

4. Aviation Noise: Work to reduce noise impacts resulting from aircraft operations at John Wayne Airport by: (a) participating and monitoring the planning process for John Wayne Airport; (b) continuing to discourage general and commercial aviation activities which increase noise exposure to sensitive land uses.

Responsible Agency/Department: Community Development

Funding Source: City General Fund

Time Frame: Ongoing

Related Noise Element Policies: 1.3-1.6

5. Aviation Monitoring: The City shall continue to review and report on the noise reports received concerning John Wayne Airport to identify any of the areas of the City where negative impacts exist in order to implement mitigation efforts, which could include lobbying of the FAA and related agencies for tighter restrictions on aircraft types.

Responsible Agency/Department: Community Development

Funding Source: City General Fund

Time Frame: Ongoing

Related Noise Element Policies: 1.3-1.6

NOISE AND LAND USE PLANNING INTEGRATION

6. Compatibility Standards Application: Through the Design Review process Noise Element Standards of compatibility described in Tables N-2 and N-3 of the Element will be applied to new development proposals and methods to mitigate anticipated impacts, such as building orientation and acoustical barriers, shall be applied to meet the standards.

Responsible Agency/Department: Community Development

Funding Source: Development fees

Time Frame: Ongoing

Related Noise Element Policies: 2.1, 2.3-2.8

7. Noise Insulation: Interior and exterior noise levels for proposed new development shall be required to meet the California Noise Insulation Standards (Title 24 of the California Administrative Code). These standards shall also be applied to all single family developments and condominium conversion projects where feasible.

Responsible Agency/Department: Community Development

Funding Source: Development fees

Time Frame: Ongoing

Related Noise Element Policies: 2.1, 2.2, 2.5, 2.6

8. Acoustical Analysis: Acoustical analysis reports prepared by a qualified acoustical engineer will be required for new sensitive land uses within Noise Impact Areas identified in the Noise Plan.

Responsible Agency/Department: Community Development

Funding Source: Developer

Time Frame: Ongoing

Related Noise Element Policies: 2.4, 2.7

NON-TRANSPORTATION NOISE CONTROL

9. Noise Ordinance Enforcement: The City will enforce its Noise Ordinance to reduce excessive noise from site-specific sources, such as construction activity mechanical equipment, landscaping maintenance, loud music, truck traffic, loading and unloading activities, and other sources.

Responsible Agency/Department: Community Development, Police Department

Funding Source: City General Fund

Time Frame: Ongoing

Related Noise Element Policies: 3.1, 3.2, 3.3

10. Noise Ordinance Review: The City shall periodically review its Noise Ordinance, policies and regulations affecting noise sources in order to conform with changes in legislation and/or technologies.

Responsible Agency/Department: Community Development

Funding Source: City General Funds

Time Frame: At least once every five years

Related Noise Element Policies: 3.1

11. Occupational Safety and Health Noise Standards: City departments will comply with all state and federal OSHA noise standards and all new equipment purchases shall comply with state and federal noise standards.

Responsible Agency/Department: City Manager

Funding Source: City General Fund

Time Frame: Ongoing

Related Noise Element Policies: 3.3, 3.4

CHAPTER 6 - NOISE CONTROL

EDITOR'S NOTE: Ord. No. 828, Sec. 1, adopted July 21, 1980, amended Ch. 6 of Art. 4 to read as herein set out. Prior to amendment, Ch. 6 pertained to similar subject matter, consisted of Section 4611, derived from Ord. No. 9; Ord. No. 239; Ord. No. 450, Secs. 1—3; and Ord. No. 469.

4611 - DECLARATION OF POLICY

In order to control unnecessary, excessive and annoying sounds emanating from incorporated areas of the city, it is hereby declared to be the policy of the City to prohibit such sounds generated from all sources as specified in this chapter.

It is determined that certain noise levels are detrimental to the public health, welfare and safety and contrary to public interest, therefore, the City Council does ordain and declare that creating, maintaining, causing or allowing to create, maintain or cause any noise in a manner prohibited by or not in conformity with the provisions of this chapter, is a public nuisance and shall be punishable as such.

(Ord. No. 828, Sec. 1, 7-21-80)

4612 - DEFINITIONS

The following words, phrases and terms as used in this chapter shall have the meaning as indicated below:

(1) "Ambient noise level." The all-encompassing noise level associated with a given environment, being a composite of sounds from all sources, excluding the alleged offensive noise, at the location and approximate time at which a comparison with the alleged offensive noise is to be made.

(2) "A-weighted sound level" (dB(A)). A quantity in decibels, read from a standard sound-level meter that is switched to the weighting network labeled "A." The A-weighted network discriminates against the lower frequencies according to a relationship approximating the auditory sensitivity of the human ear at moderate sound levels.

(3) "Commercial property." A parcel of real property which is developed and zoned either in part or in whole for commercial purposes, including, but not limited to retail and wholesale businesses, and professional offices, but excluding home occupation uses as authorized by Ordinance No. 330.

(4) "CNEL" (community noise equivalent level). A cumulative measure of community noise exposure for a twenty-four-hour day, using the A-weighting sound level and expressed in logarithmic units. This CNEL scale takes into account the single event sound level, single event duration, single event occurrence frequency, and the time of the

occurrence of the noise source. Additionally, it applies weighting factors which place greater significance on noise events occurring in the nighttime (10:00 p.m. to 7:00 a.m.) than on those during the evening (7:00 p.m. to 10:00 p.m.) or daytime (7:00 a.m. to 7:00 p.m.), respectively.

(5) "Cumulative period." An additive period of time composed of individual time segments which may be continuous or interrupted.

(6) "Decibel" (dB). A unit which denotes the ratio between two (2) quantities which are proportional to power: The number of decibels corresponding to the ratio of two (2) amounts of power is ten (10) times the logarithm to the base ten (10) of this ratio.

(7) "Dwelling unit." A single unit providing complete, independent living facilities for one (1) or more persons including permanent provisions for living, sleeping, eating, cooking and sanitation.

(8) "Emergency machinery," "vehicle," or "work." Any machinery, vehicle or work used, employed or performed in an effort to protect, provide or restore safe conditions in the community or for the citizenry, or work by private or public utilities when restoring utility service.

(9) "Fixed noise source." A stationary device which creates sounds while fixed or motionless including, but not limited to, industrial and commercial machinery and equipment, pumps, fans, compressors, generators, air conditioners and refrigeration equipment.

(10) "Grading." Any excavating or filling of earth material, or any combination thereof, conducted at a site to prepare said site for construction or other improvements thereon.

(11) "Impact noise." The noise produced by the collision of one (1) mass in motion with a second mass which may be either in motion or at rest.

(12) "Industrial property." A parcel of real property which is developed and zoned either in part or in whole for manufacturing purposes, including research and development uses, but excluding home occupation cases as authorized by Ordinance No. 330.

(13) "Mixed use property." A parcel of real property which is developed or used for residential purposes and/or commercial purposes (including retail and wholesale businesses and professional offices) and/or manufacturing purposes (including research and development uses).

(14) "Mobile noise source." Any noise source other than a fixed noise source.

(15) "Noise level." The "A" weighted sound pressure level in decibels obtained by using a sound level meter at slow response with a reference pressure of twenty (20) micropascals per square meter. The unit of measurement shall be designated as dB(A).

(16) "Noise variance board." An administrative board of five (5) members appointed by the Board of Supervisors of the County of Orange, per Title 4, Division 6, Article 1 of the

Codified Ordinances of the County of Orange.

(17) "Person." A person, firm, association, copartnership, joint venture, corporation or any entity, public or private in nature.

(18) "Property maintenance equipment." A mechanical blower, leafblower, lawn vacuum or parking lot sweeper which produces a current of air by mechanical, electrical, or other means to push, propel, or blow dirt, dust, leaves, grass clippings, trimmings, cuttings, refuse, and/or debris or any other appliance intended for the maintenance of landscaping on private property.

(19) "Residential property." A parcel of real property which is developed and zoned either in part or in whole for residential purposes, other than transient uses such as hotels and motels.

(20) "Simple tone noise." A noise characterized by a predominant frequency or frequencies so that other frequencies cannot be readily distinguished.

(21) "Sound level meter." An instrument meeting American National Standard Institute's Standard S1.4-1971 for Type 1 or Type 2 sound level meters or an instrument and the associated recording and analyzing equipment which will provide equivalent data.

(22) "Sound pressure level" of a sound, in decibels, shall mean twenty (20) times the logarithm to the base ten (10) of the ratio of the pressure of the sound to a reference pressure, which reference pressure shall be explicitly stated.

(Ord. No. 828, Sec. 1, 7-21-80; Ord. No. 845, Secs. 1—3, 5-18-81; Ord. No. 1156, Sec. 1, 10-16-95; Ord. No. 1277, Sec. 2, 7-7-03)

4613 - DESIGNATED NOISE ZONES

The properties hereinafter described are hereby assigned the following noise zones:

(a) Noise Zone 1: All residential properties.

(b) Noise Zone 2: All commercial properties.

(c) Noise Zone 3: All industrial properties.

(d) Noise Zone 4: All special properties such as hospitals, convalescent homes, public and institutional schools, libraries and churches.

(e) Noise Zone 5: All mixed use properties.

(Ord. No. 828, Sec. 1, 7-21-80; Ord. No. 1277, Sec. 3, 7-7-03)

4614 - EXTERIOR NOISE STANDARDS

(a) The following noise standards, unless otherwise specifically indicated, shall apply to all

property within a designated noise zone:

EXTERIOR NOISE STANDARDS

Noise Zone	Noise Level	Time period
1	55 dB(A)	7:00 a.m.—10:00 p.m.
	50 dB(A)	10:00 p.m.— 7:00 a.m.
2	60 dB(A)	any time
3	70 dB(A)	any time
4	55 dB(A)	any time
5	60 dB(A)	any time

In the event the alleged offensive noise consists of impact noise, simple tone noise, speech, music, or any combination thereof, each of the above noise levels shall be reduced by five (5) dB(A).

(b) It shall be unlawful for any person at any location within the incorporated area of the City to create any noise, or to allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person, when the foregoing causes the noise level, when measured on any other property to exceed:

(1) The noise standard for a cumulative period of more than thirty (30) minutes in any hour; or

(2) The noise standard plus five (5) db(A) for a cumulative period of more than fifteen (15) minutes in any hour; or

(3) The noise standard plus ten (10) dB(A) for a cumulative period of more than five (5) minutes in any hour; or

(4) The noise standard plus fifteen (15) dB(A) for a cumulative period of more than one (1) minute in any hour; or

(5) The noise standard plus twenty (20) dB(A) for any period of time.

(c) In the event the ambient noise level exceeds any of the first four (4) noise limit categories above, the cumulative period applicable to said category shall be increased to reflect said

ambient noise level. In the event the ambient noise level exceeds the fifth noise limit category, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level.

(Ord. No. 828, Sec. 1, 7-21-80; Ord. No. 845, Secs. 4, 5, 5-18-81; Ord. No. 1277, Sec. 4, 7-7-03)

4615 - INTERIOR NOISE STANDARDS

(a) The following interior noise standards, unless otherwise specifically indicated, shall apply to all property within a designated noise zone:

INTERIOR NOISE STANDARDS

Noise Zone	Noise Level	Time Period
1	55 dB(A)	7:00 a.m.—10:00 p.m.
	45 dB(A)	10:00 p.m.— 7:00 a.m.
5 (residential uses only)	55 dB(A)	7:00 a.m.—10:00 p.m.
	45 dB(A)	10:00 p.m.—7:00 a.m.

In the event the alleged offensive noise consists of impact noise, simple tone noise, speech, music, or any combination thereof, each of the above noise levels shall be reduced by five (5) dB(A).

(b) It shall be unlawful for any person at any location within the incorporated area of the city to create any noise, or to allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person, when the foregoing causes the noise level, when measured within any other dwelling unit on any residential property or mixed use property, to exceed:

(1) The interior noise standard for a cumulative period of more than five (5) minutes in any hour; or

(2) The interior noise plus five (5) dB(A) for a cumulative period of more than one (1) minute in any hour; or

(3) The interior noise standard plus ten (10) dB(A) for any period of time.

(c) In the event the ambient noise level exceeds either of the first two (2) noise limit categories above, the cumulative period applicable to said category shall be increased to reflect said

ambient noise level. In the event the ambient noise level exceeds the third noise limit category, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level.

(Ord. No. 828, Sec. 1, 7-21-80; Ord. No. 845, Sec. 6, 5-18-81; Ord. No. 1277, Sec. 5, 7-7-03)

4616 - SPECIFIC DISTURBING NOISES PROHIBITED

It shall be unlawful for any person to make, continue, cause to allow to be made or continued for any amount of time the following acts and things which are hereby declared to be unnecessary, excessive and annoying in violation of this article:

(1) Loudspeakers, amplifiers used for advertising. The using, operating or permitting to be played, used, or operated of any radio receiving set, musical instrument, phonograph, loudspeaker, sound amplifier, or other machine or device for the producing or reproducing of sound in excess of the levels described in sections 4614 and 4615 which sound is cast upon the public streets for the purpose of commercial advertising or attracting the attention of the public to any commercial building or structure.

(2) Construction, repairing, remodeling or demolition and grading. The erection, demolition, alteration, repair, excavation, grading, paving or construction of any building or site is prohibited between the hours of 6:00 p.m. and 7:00 a.m., Monday through Friday and 5:00 p.m. and 9:00 a.m. on Saturdays and during all hours Sundays and city observed federal holidays. Trucks, vehicles and equipment that are making or are involved with material deliveries, loading or transfer of materials, equipment service, maintenance of any devices or appurtenances to any construction project in the City shall not be operated on or adjacent to said sites outside of the approved hours for construction activity.

Exception: Construction activities may be permitted outside of those limitations identified in this subsection in the case of urgent necessity or upon a finding that such approval will not adversely impact adjacent properties and the health, safety and welfare of the community if a temporary exception is granted in writing by the Building Official for private property or by the Director of Public Works for public properties or their authorized representatives. All temporary waiver requests shall be made in writing and shall include the specific times, dates and locations requested and a description of the type of activity that is proposed. In granting a temporary exception, conditions may be imposed on construction activities to protect the health, safety and welfare of the community. Any approval granted may be summarily revoked by the Building Official or Director of Public Works at the sole discretion of each official. Notice of such revocation shall be provided to the requestor, Police Department and project file.

(3) Pile drivers, hammers, etc., the operation of a pile driver, power shovel, pneumatic

hammer, grading and excavating machinery, paving equipment, or other appliance, the use of which is attended by loud or unusual noise is prohibited between any and all hours on Sundays and city observed federal holidays, between the hours of 6:00 p.m. and 7:00 a.m., Monday through Friday, and between 5:00 p.m. and 9:00 a.m. on Saturdays.

Exception: In the case of urgent necessity and upon a finding that such approval will not adversely impact adjacent properties and the public health, safety and welfare of the community, the above regulations may be modified in writing by the Public Works Director for public property and by the Building Official for private property or their respective authorized representatives. All temporary waiver requests shall be made in writing and shall include the specific times, dates and locations requested and a description of the type of activity that is proposed. In granting a temporary exception, conditions may be imposed on construction activities to protect the health, safety and welfare of the community. Any approval granted may be summarily revoked by the Building Official or Director of Public Works at the sole discretion of each official. Notice of such revocation shall be provided to the requestor, Police Department and project file.

(4) Property maintenance equipment. The use and operation of property maintenance equipment, the use of which is attended by loud or unusual noise, is prohibited in residentially zoned areas any and all hours on Sundays and city observed federal holidays, before 7:00 a.m. and after 6:00 p.m. Monday through Friday, and before 9:00 a.m. and after 5:00 p.m. on Saturdays. In commercial and industrially zoned areas, the use of property maintenance equipment is prohibited any and all hours on Sundays and city observed federal holidays, before 7:00 a.m. and after 10:00 p.m. Monday through Friday, and before 9:00 a.m. and after 10:00 p.m. on Saturdays. No property owner, lessee, gardener, property maintenance service, contractor, subcontractor, or employer shall permit or allow any person working at their direction to operate property maintenance equipment in violation of the provisions of this section. All debris generated by the use of property maintenance equipment shall be cleaned up and disposed of in accordance with section 4421 of this Code.

Exceptions:

a. Public property maintenance is exempt from the provisions of this subsection (4).

b. The use of property maintenance equipment may be permitted outside of those limitations identified in subsection 4616 (4) in the case of necessity or upon a finding that such approval will not adversely impact adjacent properties and the health, safety, and welfare of the community if a temporary exception is granted in writing by the Building Official or the Building Official's authorized representatives.

All temporary exception requests shall be made in writing and shall include the specific times and dates and locations requested and a description of the activity that is proposed. In granting a temporary exception, conditions may be imposed on the use of property maintenance equipment to protect the public health and safety. Any approval granted may be summarily revoked by the Building Official at the sole discretion of the Building Official. Notice of such revocation shall be provided to the requestor, Police Department and project file.

(Ord. No. 828, Sec. 1, 7-21-80; Ord. No. 845, Sec. 7, 5-18-81; Ord. No. 1083, Sec. 1, 4-21-92; Ord. No. 1143, Sec. 1, 2-21-95; Ord. No. 1156, Sec. 2, 10-16-95; Ord. No. 1197, Sec. 3, 3-16-98)

4617 - EXEMPTIONS

The following activities shall be exempted from the provisions of this chapter:

(a) Activities conducted on the grounds of any public or private nursery, elementary, intermediate or secondary school or college, public agency, and public utility.

(b) Outdoor gatherings, public dances, shows and sporting and entertainment events provided said events are conducted pursuant to a permit (license/permit) issued by the City pursuant to Article 3, Chapter 2 of the Tustin City Code relative to the staging of said events.

(c) Activities conducted on any park or playground provided such park or playground is owned and operated by a public entity.

(d) Any mechanical device, apparatus or equipment used, related to or connected with emergency machinery, vehicle or work.

(e) Noise sources associated with construction, repair, remodeling, or grading of any real property between the hours of 7:00 a.m. and 6:00 p.m. Monday through Friday and the hours of 9:00 a.m. and 5:00 p.m. on Saturdays, excluding city observed federal holidays.

(f) All mechanical devices, apparatus or equipment which are utilized for the protection or salvage of agricultural crops during periods of potential or actual frost damage or other adverse weather conditions.

(g) Mobile noise sources associated with agricultural operations provided such operations do not take place between the hours of 6:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or any time on Sunday or a city observed federal holiday.

(h) Mobile noise sources associated with agricultural pest control through pesticide application provided that the application is made in accordance with restricted material permits issued by or regulations enforced by the Agricultural Commissioner.

(i) Noise sources associated with maintenance of real property provided said activities take place between the hours of 7:00 a.m. and 6:00 p.m. on any day except Sunday or city

observed federal holidays, or between the hours of 9:00 a.m. and 6:00 p.m. on Sunday or city observed federal holidays.

(j) Any activity to the extent regulation thereof has been preempted by state or federal law.

(k) Noise sources associated with the maintenance, repair, remodeling, grading and landscaping of residential real property performed by the owner, provided such activity does take place between the hours of 7:00 a.m. and 9:00 p.m. This section does not authorize noise sources performed by independent building trades contractors.

(l) Noise sources associated with the maintenance and repair of personal property performed by the owner on the owner's residential property, provided such activity takes place between the hours of 7:00 a.m. and 9:00 p.m. This section does not authorize noise sources by independent repairmen or technicians.

(Ord. No. 828, Sec. 1, 7-21-80; Ord. No. 1143, Sec. 2, 2-21-95; Ord. No. 1156, Sec. 3, 10-16-95; Ord. No. 1197, Sec. 4, 3-16-98)

4618 - SCHOOLS, HOSPITALS, COURTS AND CHURCHES

It shall be unlawful for any person to create any noise which causes the noise level at any school, hospital, court, or church while the same is in use, to exceed the noise limits as specified in section 4614 prescribed for the assigned noise zone in which the school, hospital, or church is located, or which noise level unreasonably interferes with the use of such institutions or which unreasonably disturbs or annoys patients in the hospital, provided conspicuous signs are displayed in three (3) separate locations within one-tenth of a mile of the institution indicating the presence of a school, church, court, or hospital.

(Ord. No. 828, Sec. 1, 7-21-80)

4619 - AIR CONDITIONING AND REFRIGERATION

During a one-year period following the effective date of Ordinance No. 828 the noise level standards as specified in Sections 4614 and 4615 shall be increased by eight (8) dB(A) where the alleged noise source is an air-conditioning apparatus or refrigeration system, which was installed prior to the effective date of said Ordinance.

(Ord. No. 828, Sec. 1, 7-21-80)

4620 - NOISE LEVEL MEASUREMENT CRITERIA

Any noise level measurements made pursuant to the provisions of this Chapter shall be performed using a sound level meter as defined in Section 4612. The location selected for measuring exterior noise levels shall be at any point on the affected property. Interior noise measurements shall be made within the

dwelling unit affected by exterior noise. The measurement shall be made at a point at least four (4) feet from the wall, ceiling, or floor nearest the alleged offensive noise source and may be made with the windows of the affected unit open.

(Ord. No. 828, Sec. 1, 7-21-80)

4621 - RESERVED

Editor's note— Section 11 of Ord. No. 1366, adopted Nov. 11, 2009, repealed Section 4621, which pertained to the manner of enforcement; adoption of Title 4, Division 6, Codified Ordinances of Orange County, and derived from Ord. No. 828, adopted July 21, 1980; and Ord. No. 845, adopted May 18, 1981.

4622 - RESERVED

Editor's note— Section 11 of Ord. No. 1366, adopted Nov. 11, 2009, repealed Section 4622, which pertained to variance procedure, and derived from Ord. No. 828, adopted July 21, 1980.

4623 - RESERVED

Editor's note— Section 11 of Ord. No. 1366, adopted Nov. 11, 2009, repealed Section 4623, which pertained to the noise variance board, and derived from Ord. No. 828, adopted July 21, 1980.

4624 - RESERVED

Editor's note— Section 11 of Ord. No. 1366, adopted Nov. 11, 2009, repealed Section 4624, which pertained to appeals and derived from Ord. No. 828, adopted July 21, 1980.

4625 - VIOLATIONS; MISDEMEANORS

Any person violating any of the provisions of this Chapter shall be deemed guilty of a misdemeanor. Each day such violation is committed or permitted to continue shall constitute a separate offense and shall be punishable as such. The provisions of this Chapter shall not be construed as permitting conduct not prescribed herein and shall not affect the enforceability of any other applicable provisions of law.

(Ord. No. 828, Sec. 1, 7-21-80; Ord. No. 845, Sec. 9, 5-18-81)

ARTICLE VI. - NOISE CONTROL

Footnotes:
*--- (**6**) ---*
***Editor's note—** Ord. No. NS-1441, § 1, enacted Aug. 21, 1978, amended Art. VI to read as set out in §§ 18-308—18-321. Formerly Art. VI, pertaining to noise, was derived from Code 1952, §§ 4270, 4270.1, 6390.9, and Ord. No. 1334, adopted Jan. 19, 1953.*

Sec. 18-308. - Declaration of policy.

In order to control unnecessary, excessive and annoying sounds emanating from areas of the city, it is hereby declared to be the policy of the city to prohibit such sounds generated from all sources as specified in this article.

It is determined that certain sound levels are detrimental to the public health, welfare and safety, and contrary to public interest.

(Ord. No. NS-1441, 1, 8-21-78)

Sec. 18-309. - Definitions.

The following words, phrases and terms as used in this article shall have the meaning as indicated below:

Ambient noise level shall mean the all-encompassing noise level associated with a given environment, being a composite of sounds from all sources, excluding the alleged offensive noise, at the location and approximate time at which a comparison with the alleged offensive noise is to be made.

Cumulative period shall mean an additive period of time composed of individual time segments which may be continuous or interrupted.

Decibel (dB) shall mean a unit which denotes the ratio between two (2) quantities which are proportional to power: The number of decibels corresponding to the ratio of two (2) amounts of power is ten (10) times the logarithm to the base ten (10) of this ratio.

Dwelling unit shall mean a single unit providing complete, independent living facilities for one or more persons including permanent provisions for living, sleeping, eating, cooking and sanitation.

Emergency machinery, vehicle or work shall mean any machinery, vehicle or work used, employed or performed in an effort to protect, provide or restore safe conditions in the community or for the citizenry, or work by private or public utilities when restoring utility service.

Fixed noise source shall mean a stationary device which creates sounds while fixed or motionless, including, but not limited to, industrial and commercial machinery and equipment, pumps, fans, compressors, generators, air conditioners and refrigeration equipment.

Grading shall mean any excavating or filling of earth material, or any combination thereof, conducted at a site to prepare said site for construction or other improvements thereon.

Impact noise shall mean the noise produced by the collision of one mass which may be either in motion or at rest.

Mobile noise source shall mean any noise source other than a fixed noise source.

Noise level shall mean the "A" weighted sound pressure level in decibels obtained by using a sound level meter at slow response with a reference pressure of twenty (20) micronewtons per square meter. The unit of measurement shall be designated as dB (A).

Person shall mean a person, firm, association, copartnership, joint venture, corporation or any entity, public or private in nature.

Residential property shall mean a parcel of real property which is developed and used either in part or in whole for residential purposes, other than transient uses such as hotels and motels.

Simple tone noise shall mean a noise characterized by a predominant frequency or frequencies so that other frequencies cannot be readily distinguished.

Sound level meter shall mean an instrument meeting American National Standard Institute's Standard S1.4-1971 for Type 1 or Type 2 sound level meters or an instrument and the associated recording and analyzing equipment which will provide equivalent data.

Sound pressure level of a sound, in decibels, shall mean twenty (20) times the logarithm to the base ten (10) of the ratio of the pressure of the sound to a reference pressure, which reference pressure shall be explicitly stated.

(Ord. No. NS-1441, § 1, 8-21-78)

Sec. 18-310. - Noise level measurement criteria.

Any noise level measurements made pursuant to the provisions of this article shall be performed using a sound level meter as defined in section 18-309.

(Ord. No. NS-1441, § 1, 8-21-78)

Sec. 18-311. - Designated noise zone.

The entire City of Santa Ana is hereby designated as "Noise Zone 1."

(Ord. No. NS-1441, § 1, 8-21-78)

Sec. 18-312. - Exterior noise standards.

(a) The following noise standards, unless otherwise specifically indicated, shall apply to all residential property within a designated noise zone:

NOISE STANDARDS

Noise Zone	Noise Level	Time Period
1	55 dB(A)	7:00 a.m.—10:00 p.m.
	50 dB(A)	10:00 p.m.— 7:00 a.m.

In the event the alleged offensive noise consists entirely of impact noise, simple tone noise, speech, music, or any combination thereof, each of the above noise levels shall be reduced by five (5) dB (A).

(b) It shall be unlawful for any person at any location within the City of Santa Ana to create any noise, or to allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person, when the foregoing causes the noise level, when measured on any other residential property, to exceed:

(1) The noise standard for a cumulative period of more than thirty (30) minutes in any hour; or

(2) The noise standard plus five (5) dB(A) for a cumulative period of more than fifteen (15) minutes in any hour; or

(3) The noise standard plus ten (10) dB(A) for a cumulative period of more than five (5) minutes in any hour; or

(4) The noise standard plus fifteen (15) dB(A) for a cumulative period of more than one minute in any hour; or

(5) The noise standard plus twenty (20) dB(A) for any period of time.

(c) In the event the ambient noise level exceeds any of the first four (4) noise limit categories above, the cumulative period applicable to said category shall be increased to reflect said ambient noise level. In the event the ambient noise level exceeds the fifth noise limit

category, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level.

(Ord. No. NS-1441, § 1, 8-21-78)

Sec. 18-313. - Interior noise standards.

(a) The following interior noise standards, unless otherwise specifically indicated, shall apply to all residential property within a designated noise zone:

INTERIOR NOISE STANDARDS

Noise Zone	Noise Level	Time Period
1	55 dB(A)	7:00 a.m.—10:00 p.m.
	45 dB(A)	10:00 p.m.—7:00 a.m.

In the event the alleged offensive noise consists entirely of impact noise, simple tone noise, speech, music, or any combination thereof, each of the above noise levels shall be reduced by five (5) dB(A).

(b) It shall be unlawful for any person at any location within the City of Santa Ana to create any noise, or to allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person, when the foregoing causes the noise level, when measured within any other dwelling unit on any residential property, to exceed:

(1) The interior noise standard for a cumulative period of more than five (5) minutes in any hour; or

(2) The interior noise standard plus five (5) dB(A) for a cumulative period of more than one minute in any hour; or

(3) The interior noise standard plus ten (10) dB(A) for any period of time.

(c) In the event the ambient noise level exceeds either of the first two (2) noise limit categories above, the cumulative period applicable to said category shall be increased to reflect said ambient noise level. In the event the ambient noise level exceeds the third noise limit category, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level.

(Ord. No. NS-1441, § 1, 8-21-78)

Sec. 18-314. - Special provisions.

The following activities shall be exempted from the provisions of this article:

(a) Activities conducted on the grounds of any public or private nursery, elementary, intermediate or secondary school or college.

(b) Outdoor gatherings, public dances and shows, provided said events are conducted pursuant to a license issued by the City of Santa Ana.

(c) Activities conducted on any park or playground, provided such park or playground is owned and operated by a public entity.

(d) Any mechanical device, apparatus or equipment used, related to or connected with emergency machinery, vehicle or work.

(e) Noise sources associated with construction, repair, remodeling, or grading of any real property, provided said activities do not take place between the hours of 8:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or any time on Sunday or a federal holiday.

(f) All mechanical devices, apparatus or equipment which are utilized for the protection or salvage of agricultural crops during periods of potential or actual frost damage or other adverse weather conditions.

(g) Mobile noise sources associated with agricultural operations, provided such operations do not take place between the hours of 8:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or at any time on Sunday or a federal holiday.

(h) Mobile noise sources associated with agricultural pest control through pesticide application, provided that the application is made in accordance with restricted material permits issued by or regulations enforced by the agricultural commissioner.

(i) Noise sources associated with the maintenance of real property, provided said activities take place between 7:00 a.m. and 8:00 p.m. on any day except Sunday or a federal holiday, or between the hours of 9:00 a.m. and 8:00 p.m. on Sunday or a federal holiday.

(j) Any activity to the extent regulation thereof has been preempted by state or federal law.

(Ord. No. NS-1441, § 1, 8-21-78)

Sec. 18-315. - Schools, hospitals and churches; special provisions.

It shall be unlawful for any person to create any noise which causes the noise level at any school, hospital or church while the same is in use to exceed the noise limits as specified in section 18-312 prescribed for the assigned noise zone in which the school, hospital or church is located, or which noise

level unreasonably interferes with the use of such institutions or which unreasonably disturbs or annoys patients in the hospital, provided conspicuous signs are displayed in three (3) separate locations within one-tenth (1/10) of a mile of the institution indicating the presence of a school, church or hospital.

(Ord. No. NS-1441, § 1, 8-21-78)

Sec. 18-316. - Air conditioning and refrigeration; special provisions.

During the five-year period following the effective date of this article, the noise standards enumerated in sections 18-312 and 18-313 shall be increased eight (8) dB(A) where the alleged offensive noise source is an air conditioning or refrigeration system or associated equipment which was installed prior to the effective date of this article.

(Ord. No. NS-1441, § 1, 8-21-78)

Sec. 18-317. - Noise level measurement.

The location selected for measuring exterior noise levels shall be at any point on the affected property. Interior noise measurements shall be made within the affected dwelling unit. The measurement shall be made at a point at least four (4) feet from the wall, ceiling, or floor nearest the alleged offensive noise source and may be made with the windows of the affected unit open.

(Ord. No. NS-1441, § 1, 8-21-78)

Sec. 18-318. - Manner of enforcement.

The chief of police, the Orange County health officer and their duly authorized representatives are directed to enforce the provisions of this article. The chief of police, the Orange County health officer and their duly authorized representatives are authorized, pursuant to Penal Code Section 836.5, to arrest any person without a warrant when they have reasonable cause to believe that such person has committed a misdemeanor in their presence.

No person shall interfere with, oppose or resist any authorized person charged with the enforcement of this article while such person is engaged in the performance of his duty.

(Ord. No. NS-1441, § 1, 8-21-78)

Sec. 18-319. - Variance procedure.

The owner or operator of a noise source which violates any of the provisions of this article may file an application with the Orange County health officer for a variance from the provisions thereof wherein said owner or operator shall set forth all actions taken to comply with said provisions, the reasons why immediate compliance cannot be achieved, a proposed method of achieving compliance, and a proposed

time schedule for its accomplishment. Said application shall be accompanied by a fee as established by resolution of the city council. A separate application shall be filed for each noise source; provided however, that several mobile sources under common ownership, or several fixed sources on a single property may be combined into one application. Upon receipt of said application and fee, the health officer shall refer it with his recommendation thereon within thirty (30) days to the Orange County Noise Variance Board for action thereon in accordance with the provisions of applicable law.

An applicant for a variance shall remain subject to prosecution under the terms of this article until a variance is granted.

(Ord. No. NS-1441, § 1, 8-21-78)

Sec. 18-320. - Appeals.

Within fifteen (15) days following the decision of the Orange County Variance Board on an application, the applicant, the health officer, or any member of the city council, may appeal the decision to the city council by filing a notice of appeal with the secretary of the Orange County Variance Board. In the case of an appeal by the applicant for a variance, the notice of appeal shall be accompanied by a fee to be computed by the secretary of the Orange County Variance Board on the basis of the estimated cost of preparing the materials required to be forwarded to the city council as discussed hereafter. If the actual cost of such preparation differs from the estimated cost appropriate payments shall be made either to or by the secretary of the Orange County Variance Board.

Within fifteen (15) days following receipt of a notice of appeal and the appeal fee, the secretary of the Variance Board shall forward to the city council copies of the application for variance; the recommendation of the health officer; the notice of appeal; all evidence concerning said application received by the variance board and its decision thereon. In addition, any person may file with the clerk of the city council written arguments supporting or attacking said decision and the city council may in its discretion hear oral arguments thereon. The clerk of the city council shall mail to the applicant a notice of the date set for hearing of the appeal. The notice shall be mailed at least ten (10) days prior to the hearing date.

Within sixty (60) days following its receipt of the notice of appeal, the city council shall either affirm, modify or reverse the decision, of the variance board. Such decision shall be based upon the city council's evaluation of the matters submitted to the city council in light of the powers conferred on the variance board and the factors to be considered, both as enumerated in section 18-319 and Orange County Ordinance section 4-6-13.

As part of its decision, the city council may direct the variance board to conduct further proceedings on said application. Failure of the city council to affirm, modify or reverse the decision of the variance board within said sixty-day period shall constitute an affirmance of the decision.

(Ord. No. NS-1441, § 1, 8-21-78)

Sec. 18-321. - Violations; misdemeanors.

Any person violating any or the provisions of this article shall be deemed guilty of a misdemeanor. Each day such violation is committed or permitted to continue shall constitute a separate offense and shall be punishable as such. The provisions of this article shall not be construed as permitting conduct not prescribed herein and shall not affect the enforceability of any other applicable provisions of law.

(Ord. No. NS-1441, § 1, 8-21-78)

Secs. 18-322—18-350. - Reserved.

CONSTRUCTION DATA

Architectural Coating
Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 01/31/2020
Case Description: TSD-17

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Architectural Coating	Residential	60.0	55.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	150.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Compressor (air)	68.1	64.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	68.1	64.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 01/29/2020
Case Description: TSD-17

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Building Construction	Residential	60.0	55.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	150.0	0.0
Generator	No	50		80.6	150.0	0.0
Tractor	No	40	84.0		150.0	0.0

Results

Equipment	Calculated (dBA) Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Noise Limit Exceedance (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq
Crane	71.0	63.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	71.1	68.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	74.5	70.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	74.5	72.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 01/29/2020
Case Description: TSD-17

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Demolition	Residential	60.0	55.0	50.0

Equipment

Description	Impact Device	Spec Usage (%)	Actual Lmax (dBA)	Receptor Lmax (dBA)	Estimated Distance (feet)	Shielding (dBA)
Concrete Saw	No	20	89.6	150.0		0.0
Excavator	No	40	80.7	150.0		0.0
Dozer	No	40	81.7	150.0		0.0

Results

Equipment	Calculated (dBA) Lmax	Calculated (dBA) Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Concrete Saw	80.0	73.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	71.2	67.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	72.1	68.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	80.0	75.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 01/29/2020
Case Description: TSD-17

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Grading	Residential	60.0	55.0	50.0

Equipment

Description	Impact Device	Spec Usage (%)	Actual Lmax (dBA)	Receptor Lmax (dBA)	Estimated Distance (feet)	Shielding (dBA)
Excavator	No	40	80.7	150.0		0.0
Dozer	No	40	81.7	150.0		0.0
Tractor	No	40	84.0	150.0		0.0

Results

	Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator	71.2	67.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	72.1	68.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	74.5	70.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	74.5	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 01/25/2020
Case Description: TSD-17

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Landscaping	Residential	60.0	55.0	50.0

Equipment

Description	Impact Device	Spec Usage (%)	Actual Lmax (dBA)	Receptor Lmax (dBA)	Estimated Distance (feet)	Shielding (dBA)
Excavator	No	40	80.7	150.0	0.0	

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator	71.2	67.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	71.2	67.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 01/29/2020
Case Description: TSD-17

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Site Prep	Residential	60.0	55.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	150.0	0.0
Tractor	No	40	84.0		150.0	0.0
Front End Loader	No	40		79.1	150.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)				Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer	72.1	68.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	74.5	70.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	69.6	65.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	74.5	73.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Attenuation Calculation				
	Residential Santa Ana		Residential Tustin	
Phase	dBA Leq	distance (ft)	dBA Leq	distance (ft)
Demolition	75	150	70.6	250
Site Preparation	73.3		68.9	
Grading	73.6		69.2	
Building Construction (pa	72.9		68.5	
Architectural Coating	64.1		59.7	
Landscaping	67.2		62.8	

Attenuation calculated through Inverse Square Law: Ln = 20Log(R2/R1)