Appendix J Noise Information and Calculations

Appendices

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LOCAL REGULATIONS

M. Noise and Vibration

The City relies on the questions included in Appendix G as the thresholds of significance for assessing impacts from noise and vibration, as augmented below[4]. Unless exempted, a noise technical report shall be prepared by a qualified acoustical engineer for inclusion in the environmental document.

Noise impacts can occur from construction operations and long-term operation of the project, both of which must be analyzed. The first step to assessing noise is to determine the ambient noise conditions. A qualified noise consultant/engineer shall conduct both short and long-term readings from the project site. A sufficient number of short-term readings shall be provided to capture ambient conditions from the project site, including within as close proximity as possible to adjoining properties and land uses. At least one (additional if warranted by the size of the project site) 24-hour noise readings shall be provided from the project site. If the project site is small, the one 24-hour measurement shall be taken from the center of the property. If the site is large, multiple measurements shall be taken closer to the project boundaries to capture a noise profile representative of all areas of the project site. All noise measurements shall be taken with calibrated equipment meeting ASTM standards. The following augments the thresholds of significance found in Appendix G.

Construction Noise: Typically, construction noise does not cause substantial noise at distances beyond 500 feet from construction activities or when construction is limited to allowed days and times[5]. Therefore, the following noise screening criteria may be used for a new project construction:

- Would construction activities occur within 500 feet of a noise sensitive use[6]?

- Would construction occur between the hours of 8:00 p.m. and 7:00 a.m. Monday through Saturday, or anytime on Sunday or federal holidays?

  A "yes" response to either of the preceding questions indicates further study is required.

Based on the above criteria, if a project requires further study of construction noise, the following significance thresholds apply:

- *Less than Significant Impact:* Construction activities lasting less than ten (10) days and conducted during permitted construction hours [Laguna Niguel Municipal Code Section 6-6-7(5)] are considered a small project and exempt from further construction noise analysis, because while construction noise is temporary, construction duration of less than ten (10) days represents a small project with limited ability for physical impacts to the environment resulting in a less than significant impact.

[4] The augmented thresholds of significance were prepared in consultation with Farshad Farhang of A/E Tech, LLC.

[5] The distance of 500 feet is applied as a screening threshold because noise naturally attenuates at 6 dB every doubling of distance of the reference noise source. Most construction equipment has a reference noise source of 50 feet. Therefore, at 500 feet noise will have naturally attenuated over 20 dB, which also does not account for other natural attenuation such as topography, vegetation, or other structures. A 20 dB reduction would substantially reduce noise emissions from the loudest construction equipment below a level that would regularly impair speech, resulting in a less than significant impact.

[6] Noise sensitive land uses are defined in Chapter VI of the Noise Element of the Laguna Niguel General Plan as "residential areas, school sites, childcare areas, library, parks and a senior center site." (LNGP Noise Element, Page 16).

- *Less than Significant Impact:* Construction activities that would not exceed the ambient exterior noise level by 5 dBA[7] at a noise-sensitive use between the hours of 8:00 p.m. and 7:00 a.m. Monday through Saturday, or anytime on Sunday are considered less than significant.

- *Significant Impact:* Construction activities lasting more than ten (10) days in a three (3)-month period would result in ambient exterior hourly noise level (Leq) to exceed baseline sound levels by:

  - 10 dBA or more at noise-sensitive areas exposed to baseline noise levels less than 60 dBA hourly Leq, or

  - 5 dBA or more at noise-sensitive locations exposed to a baseline noise level of 60 dBA hourly Leq or higher[8].

Operational Noise: Project operational impacts are generally due to the project including single or multiple noise sources within the project site, or causing increases in vehicular traffic on city streets, or both. Therefore, the following operational noise screening criteria may be used for a new project construction:

- Would the proposed project introduce a stationary noise source likely to be audible beyond the property line of the project site?

- Would the project include 75 or more dwelling units, 100,000 square feet or greater of nonresidential development, or have the potential to generate 1,000 or more average daily vehicle trips?[9]

  A "no" response to both preceding questions indicates no further study is required. A "yes" response to either of the preceding questions indicates further study is required.

If the above screening process for a project indicates that further study of operational noise effects is required, the following significance thresholds apply.

[7] Increases in noise levels of 5 dBA or more are proven to be clearly noticeable by individuals with normal hearing.

[8] The establishment of these thresholds includes three components that result in physical changes to the environment. First, the thresholds are based on noise levels that would begin to interfere with speech communication at normal voice volume. Second, in lower ambient conditions, noise increases may appear more dramatic to the receptor, therefore, 10 dBA was selected as threshold based on human perception of noise increase. Third, at higher ambient conditions more input of noise energy, which translates to intensity of construction activities, is necessary to cause noise increases, which is the reason for the 5 dB increase, which is proven to be clearly noticeable by individuals with normal hearing.

[9] Development projects of less intensity than these thresholds have been demonstrated through prior study to not result in noise level increase above 3 dBA in typical city settings. An increase of 3 dBA is the point where noise increases become barely perceptive to most individuals with normal hearing. A less than 3 dBA increase would therefore not be a noticeable increase and therefore, less than significant.

A project would have a significant noise impact on nearby noise-sensitive land uses if[10]:

- The project results in ambient exterior noise levels at nearby noise-sensitive uses to increase above the City standards in **Table 5** (i.e., 65 dB CNEL for residential land uses); or

Table 5. City of Laguna Niguel Land Use Noise Standards (CNEL, dBA)

Land Use	Interior Standard	Exterior Standard
Residential – Detached Residential – Attached	45	65
Neighborhood Commercial Community Commercial	--	70
Professional Office	50	70
Community Commercial/Professional Office	--	70
Industrial/ Business Park	55[1]	70
Professional Office/ Industrial/Business Park Industrial/Business Park/ Professional Office/ Community Commercial	--	75
Public/Institutional Public Institutional/ Professional Office	50	70
Schools	50[2]	65[2]
Parks and Recreation	--	70

Notes:
1. Where quiet is a basis for use.
2. In interior or exterior classroom areas during school operating hours.

Source: Laguna Niguel General Plan, Table N-9, 1992

- Baseline noise levels at nearest noise-sensitive land uses without the project are below 60 dBA CNEL and the project results in noise level increases of 5 dBA CNEL[11] or more in ambient noise levels; or

- Baseline noise levels at nearest noise-sensitive land uses without the project are in the range of 60-65 dBA CNEL and the project results in ambient noise levels that are 3dBA CNEL[12] or more above baseline noise levels; or

- Baseline noise levels at nearest noise-sensitive land uses without the project are above 65 dBA CNEL and the project results in a noise level increase of 1.5 dBA CNEL[13] or more above baseline noise levels.

[10] The thresholds established in this section pertain to land use and changes to the environment that are either significant or less than significant pursuant to CEQA. The Laguna Niguel Municipal Code Division 6, Noise Control, provides noise standards that regulate noise as a nuisance and are enforceable standards by the Sheriff. The standards in that section are not meant to be used to determine land use compatibility or changes to the environment analyzed under CEQA.
[11] Increases in noise levels of 5 dBA or more are proven to be clearly noticeable by individuals with normal hearing.
[12] A 3 dBA increase may be detectible by some people.
[13] A 1.5 dBA increase is generally not perceptible by most people.

The Laguna Niguel Municipal Code sets an interior noise standard of 45 dBA during the nighttime hours of 10:00 pm to 7:00 am. Projects located in noisy environments must include measures to meet this standard. However, case law has determined that CEQA analyzes the impacts of a project on the environment and not impacts of the environment on a project. Although sound land use planning may dictate otherwise, the CEQA document is not required to analyze how a project will meet the 45 dBA interior standard. The information is helpful to include in the CEQA document because it could affect the placement of exterior walls or construction materials, both of which are important details for other aspects of the entitlement process.

Vibration: The state CEQA Guidelines do not define the levels at which groundborne vibration or groundborne noise would be considered "excessive." However, the Federal Transit Administration (FTA) has published criteria for the analysis of vibration relating to transportation- and construction-induced vibration. The FTA has established thresholds that pertain to both building damage and human annoyance from groundborne vibration. Therefore, through adoption of this Manual the City has established the following standards from the FTA as the thresholds of significance for vibration impacts, as shown in Tables 6 and 7 below.

Table 6 lists the vibration damage criteria for four general categories of buildings. These criteria are expressed in terms of Peak Particle Velocity (PPV). PPV is the maximum instantaneous positive or negative peak of the vibration signal, often used in monitoring of construction vibration (such as blasting) since it is related to the stresses that are experienced by buildings and is not used to evaluate human response.

Criteria listed in **Table 7** are thresholds of vibration levels that would result in annoyance of occupants or interference with activities of various building categories. These levels are expressed in terms of the vibration velocity level in the decibel scale (VdB), which is used to evaluate human response.

It should be noted, projects using only equipment that generates little or no ground vibration, such as air compressors, light trucks, and hydraulic loaders, would only require qualitative descriptions. A quantitative construction vibration analysis is appropriate for projects where construction vibration may result in building damage or prolonged annoyance. For example, activities involving blasting, piledriving, vibratory compaction, demolition, drilling, or heavy grading or excavation near sensitive structures require a quantitative vibration analysis.

Table 6. Construction Vibration Damage Criteria

Building Category	PPV (in/sec)
I. Reinforced-concrete, steel, or timber (no plaster)	0.5
II. Engineered concrete and masonry (no plaster)	0.3
III. Non-engineered timber and masonry buildings	0.2
IV. Buildings extremely susceptible to vibration damage	0.12

Source: Federal Transit Administration, Noise and Vibration Impact Assessment Manual, 2018.

Table 7. Groundborne Vibration Sensitivity Criteria

Building Category	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1: High Sensitivity. Buildings where vibration would interfere with interior operations (e.g., vibration-sensitive research and manufacturing facilities, hospitals with vibration-sensitive equipment, and research operations).	65 VdB	65 VdB	65 VdB
Category 2: Residential uses and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB
Category 3: Institutional land uses, such as schools, churches, other institutions, and quiet offices that do not have vibration-sensitive equipment, but still have the potential for activity interference.	75 VdB	78 VdB	83 VdB

[1] More than 70 vibration events of the same source per day.
[2] Between 30 and 70 vibration events of the same source per day.
[3] Fewer than 30 vibration events of the same kind per day.

Source: Federal Transit Administration, Noise and Vibration Impact Assessment Manual, 2018.

N. Population and Housing

The City relies on the questions included in Appendix G as the thresholds of significance for assessing impacts on population and housing.

To determine population increase from a project, the City relies on demographic data prepared by the Department of Finance. One of the Department of Finance's data publications updated regularly is Table E-5, which shows population and housing data. For January 2020, the City had an average of 2.61 persons per dwelling unit. This number, adjusted annually, should be used to determine population increase from a project, as well as other requirements, such as parkland dedication.

O. Public Services

The City relies on the questions included in Appendix G as the thresholds of significance for assessing impacts on public services, as augmented below.

Orange County Fire Authority (OCFA) provides structural fire protection, emergency medical and rescue services, hazardous inspections and response, and public education activities within the City. OCFA has three stations located within the City and many areas of the City are served by OCFA stations in other communities, such as Dana Point, San Juan Capistrano, Mission Viejo, and Aliso Viejo. OCFA has a performance goal of arriving at a core emergency from receipt of the call at the dispatch center within 7 minutes and 30 seconds, 90% of the time (OCFA Standards of Coverage and Deployment Plan, 2014). Proposed projects should be evaluated to determine if the project would cause a negative change to OCFA's response time goals as amended from time to time, leading to the need for expanded or new fire facilities, the construction of which would result in an impact to the environment.

Orange County Sheriff Department (OCSD) is responsible for providing police protection within the City. All emergency calls are received and dispatched from Laguna Niguel City Hall. Unlike OCFA, Sheriff Deputy's response time varies because assigned patrols are usually in the field and do not have a fixed starting point. Currently the City provides approximately one officer per 2,000 residents. Proposed

Division 6 - NOISE CONTROL

Article 1.	General Provisions, §§ 6-6-1—6-6-15

ARTICLE 1. - GENERAL PROVISIONS

Sec. 6-6-1. - Declaration of policy.

In order to control unnecessary, excessive and annoying sounds emanating from 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. 90-11, § 4, 3-6-90)

Sec. 6-6-2. - Definitions.

The following words, terms and phrases, when used in this article, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

Ambient noise level means 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 means an additive period of time composed of individual time segments which may be continuous or interrupted.

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

Dwelling unit means 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 means 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 means 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 means any excavating or filling of earth material, or any combination thereof, conducted at a site to prepare the site for construction or other improvements thereon.

Impact noise means the noise produced by the collision of one mass in motion with a second mass which may be either in motion or at rest.

Mobile noise source means any noise source other than a fixed noise source.

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

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

Residential property means 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 means a noise characterized by a predominant frequency so that other frequencies cannot be readily distinguished.

Sound level meter means an instrument meeting American National Standard Institute 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, means 20 times the logarithm to the base 10 of the ratio of the pressure of the sound to a reference pressure, which reference pressure shall be explicitly stated.

(Ord. No. 90-11, § 4, 3-6-90)

Cross reference— Definitions generally, § 1-1-18.

Sec. 6-6-3. - Noise level measurement equipment.

Any noise level measurements made pursuant to the provisions of this article shall be performed using a sound level meter.

(Ord. No. 90-11, § 4, 3-6-90)

Sec. 6-6-4. - Designated noise zone.

The entire territory of the city is hereby designated as Noise Zone 1.

(Ord. No. 90-11, § 4, 3-6-90)

Sec. 6-6-5. - 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.

If the alleged offensive noise consists entirely of impact noise, simple tone noise, speech or music, or any combination thereof, each of the noise levels specified in the table in this subsection shall be reduced by five dB(A).

(b) It shall be unlawful for any person at any location within 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 such noise causes the noise level, when measured on any other residential property, to exceed:

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

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

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

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

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

(c) If the ambient noise level exceeds any of the first four noise limit categories in subsection (b) of this section, the cumulative period applicable to category shall be increased to reflect the ambient noise level. If the ambient noise level exceeds the fifth noise limit category, the maximum allo level under such category shall be increased to reflect the maximum ambient noise level.

(Ord. No. 90-11, § 4, 3-6-90)

Sec. 6-6-6. - 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.

If the alleged offensive noise consists entirely of impact noise, simple tone noise, speech or music, or any combination thereof, each of the noise levels specified in the table in this subsection shall be reduced by five dB(A).

(b) It shall be unlawful for any person at any location within 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 such noise 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 minutes in any hour;

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

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

(c) If the ambient noise level exceeds either of the first two noise limit categories in subsection (b) of this section, the cumulative period applicable to the category shall be increased to reflect such ambient noise level. If the ambient noise level exceeds the third noise limit

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

(Ord. No. 90-11, § 4, 3-6-90)

Sec. 6-6-7. - Exemptions from article.

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

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

(2) Outdoor gatherings, public dances and shows, provided such events are conducted pursuant to a license issued by the city pursuant to title 5.

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

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

(5) Noise sources associated with construction, repair, remodeling or grading of any real property, provided such activities 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.

(6) 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.

(7) 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.

(8) 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.

(9) Noise sources associated with the maintenance of real property, provided such 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.

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

(11) Noise sources associated with the construction, repair or maintenance of any public street, or the construction, installation, repair or maintenance of any facilities owned by or operated by the city or a utility, including, but not limited to, water, sewer, electricity, gas, storm drain, traffic control, telephone and cable television, provided the director of public works determines that an unusual or unique condition exists and that all other reasonable alternatives are not feasible for the construction, repair or maintenance to take place between 7:00 a.m. and 8:00 p.m. on weekdays, including Saturdays.

Unusual and unique conditions for which there are no reasonable feasible alternatives include, but are not limited to, the following:

a. Construction, repair or maintenance of a public street that would have an adverse impact on the flow of traffic on that street if

such construction, repair or maintenance took place between 7:00 a.m. and 8:00 p.m. on weekdays, including Saturdays.

b. Construction, installation, maintenance or repair of water, sewer, electricity, gas, storm drain, traffic control, telephone or cable television lines and appurtenant facilities when there would be less interference with the use of such utilities and facilities by members of the public at night than during normal working hours.

c. Sewer line repairs when there would be minimal flow in the line at night.

d. Construction, repair or maintenance of facilities over existing public streets, such as power lines and bridges.

e. Construction, repair or maintenance of a public street that requires that the street be closed in both directions.

f. Construction, repair or maintenance of a public street that is at or near a freeway, especially if the state department of transportation requires that such work be done at night.

(Ord. No. 90-11, § 4, 3-6-90; Ord. No. 2007-149, § 2, 10-16-07)

Sec. 6-6-8. - Creation of noise near schools, hospitals and churches.

It shall be unlawful for any person to create any noise which causes the noise level at any school, hospital or church while the school, hospital or church is in use to exceed the noise limits as specified in section 6-6-5 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 separate locations within one-tenth mile of the institution indicating the presence of a school, church or hospital.

(Ord. No. 90-11, § 4, 3-6-90)

Sec. 6-6-8.1. - Motor vehicle racing.

It shall be unlawful to conduct motor vehicle racing, testing, timing or similar noise-producing activities at raceways, speedways, offroad vehicle courses, drag strips or other similar places, including but not limited to the operation of midget race cars, drag cars, motorcycles, offroad vehicles and specialty automobiles, between the hours of 11:30 p.m. and 8:00 a.m.

(Ord. No. 90-11, § 4, 3-6-90)

Cross reference— Highways, right-of-way and vehicles, tit. 7; creating disturbance by vehicle, § 11-8-48.

Sec. 6-6-9. - Air conditioning and refrigeration equipment.

During the five-year period following the effective date of this article, the noise standards enumerated in sections 6-6-5 and 6-6-6 shall be increased eight 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. 90-11, § 4, 3-6-90)

Sec. 6-6-10. - Noise level measurement location.

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 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. 90-11, § 4, 3-6-90)

Sec. 6-6-11. - Enforcement of article.

(a) The chief of police and his duly authorized representatives are directed to enforce the provisions of this article. The chief of police and his duly authorized representatives are authorized, pursuant to penal code § 836.5, to arrest any person without a warrant where they have reasonable cause to believe that such person has committed a misdemeanor in their presence.

(b) 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. 90-11, § 4, 3-6-90; Ord. No. 96-92, § 5, 8-20-96)

Sec. 6-6-12. - Variance procedure.

(a) The owner or operator of a noise source which violates any of the provisions of this article may file an application with the chief of police for a variance from the provisions of this article, wherein the owner or operator shall set forth all actions taken to comply with such provisions, the reasons why immediate compliance cannot be achieved, and a proposed method of achieving compliance and a proposed time schedule for its accomplishment. The application shall be accompanied by a fee in the amount of $75.00. 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 the application and fee, the chief of police shall refer it, with his recommendation thereon, within 30 days, to the noise variance board for action thereon in accordance with the provisions of this article.

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

(Ord. No. 90-11, § 4, 3-6-90; Ord. No. 96-92, § 6, 8-20-96)

Sec. 6-6-13. - Noise variance board.

(a) There is hereby created a noise variance board consisting of five members. Two of the members shall be professional engineers, one of whom shall have demonstrated knowledge and experience in the field of acoustics, and one of whom shall be a registered mechanical engineer. One member shall be a physician licensed in this state, qualified in the field of physiological effects of noise. One member shall be a representative of business and industry. One member shall be a representative of the general public.

(b) The noise variance board shall evaluate all applications for variance from the requirements of this article and may grant such variances with respect to time for compliance, subject to such terms, conditions and requirements as it may deem reasonable to achieve maximum compliance with the provisions of article. Such terms, conditions and requirements may include but shall not be limited to limitations on noise levels and operating hours. Each such variance shall set forth in detail the approved method of achieving maximum compliance and a time schedule for its accomplishment. In its determinations, the board shall consider the magnitude of nuisance caused by the offensive noise; the uses of property within the area of impingement by the noise; the time factors related to study, design, financing and construction of remedial work; the economic factors related to age and useful life of equipment; and the general public interest and welfare. Any variance granted by the board shall be by resolution and shall be transmitted to the health officer for enforcement. Any violation of the terms of the variance shall be unlawful.

(c) Members of the variance board shall be appointed by and shall serve at the pleasure of the city council. The board shall adopt reasonable rules and regulations for its own procedures in carrying out its functions under the provisions of this article.

(d) Three members shall constitute a quorum and at least three affirmative votes shall be required in support of any action.

(e) The chief of police or his appointed representative shall be a nonvoting ex officio member of the variance board, and shall act as secretary of the board.

(f) Meetings of the noise variance board shall be held at the call of the secretary and at such times and locations as the board shall determine. All such meetings shall be open to the public.

(g) Traveling and other expenses incurred by each board member in the performance of his official duties shall be reimbursed at a rate determined by resolution of the city council.

(Ord. No. 90-11, § 4, 3-6-90; Ord. No. 96-92, § 7, 8-20-96)

Cross reference— Commissions, boards and committees, § 2-3-1 et seq.

Sec. 6-6-14. - Appeal of decisions of variance board.

(a) Within 15 days following the decision of the noise variance board on an application, the applicant, chief of police or any member of the city coun appeal the decision to the city council by filing a notice of appeal with the secretary of the variance board. In the case of an appeal by the applica variance, the notice of appeal shall be accompanied by a fee to be computed by the secretary on the basis of the estimated cost of preparing the required to be forwarded to the city council as discussed in this section. If the actual cost of such preparation differs from the estimated cost, ap payments shall be made either to or by the secretary.

(b) Within 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 chief of police, the notice of appeal, and all evidence concerning the application received by the variance board and its decision thereon. In addition, any person may file with the city council written arguments supporting or attacking the decision and the city council may in its discretion hear oral arguments thereon. The city clerk shall mail to the applicant a notice of the date set for hearing of the appeal. The notice shall be mailed at least ten days prior to the hearing date.

(c) Within 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 sections 6-6-12 and 6-6-13.

(Ord. No. 90-11, § 4, 3-6-90; Ord. No. 96-92, § 8, 8-20-96)

Sec. 6-6-15. - Violation of article.

Any person violating any of 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 in this article, and shall not affect the enforceability of any other applicable provisions of law.

(Ord. No. 90-11, § 4, 3-6-90)

General Plan for the City of Laguna Niguel

Chapter 6 - Noise

Table of Contents

Table of Contents - Continued

List of Figures

List of Tables

Chapter Six

NOISE

I. INTRODUCTION

Noise has long been an accepted part of modern civilization and the urbanization process. The general background level of noise, however, seems to be rising as modern transportation systems develop and human dependence upon machines rises. As society becomes highly mobile and mechanization continues to increase, so does the need for a better understanding of the effects of noise exposure in the environment.

The planning process has not traditionally been concerned with noise. In many instances, noise problems were identified only after the noise sources were allowed to establish in a community. It is now evident that these situations could have been avoided by considering noise generators and noise sensitive receptors as part of the comprehensive planning process.

II. CONSISTENCY WITH STATE PLANNING LAW

The Noise Element of the General Plan is a mandatory component pursuant to State law (California Planning and Zoning Law, Section 65302(f)). It must recognize the guidelines adopted by the California Office of Noise Control pursuant to Section 46050.1 of the Health and Safety Code. More importantly, the Noise Element should provide a systematic approach to: (1) the measurement and modeling of noise; (2) the establishment of noise standards; (3) the control of major noise sources; and (4) community planning for the regulation of noise. It is a guide used to identify and mitigate noise problems. The Noise Element establishes uniformity between City policy and programs undertaken to control and abate environmental noise. It also serves as a guideline for compliance with the State's noise insulation standards.

The Government Code and Office of Noise Control require that certain major noise sources and areas containing noise sensitive land uses be identified and quantified by preparing generalized noise exposure contours for current and projected levels of activity within the Community. Contours may be prepared in terms of either the Community Noise Equivalent (CNEL) or the Day-Night Average Level (Ldn) which are both descriptors of total noise exposure at a given location for an annual average day.

It is intended that the noise exposure information developed for the Noise Element be incorporated into the General Plan to serve as a basis for achieving land use compatibility with respect to noise through the long range planning and project review processes. It is also intended that noise exposure information be used to provide baseline information and noise source identification for use in formulating modifications to and enforcement of the local noise control ordinance.

III. RELATED PLANS AND PROGRAMS

There are a number of plans and programs related to the regulation of noise in Laguna Niguel. These programs are implemented at the federal, state and local levels of government.

At the federal level, three agencies have an effect on Laguna Niguel's noise environment. They are the Environmental Protection Agency (EPA), the Department of Defense and the Department of Transportation. In addition, the Department of Housing and Urban Development and the Federal Housing Administration establish standards for projects which receive their financial support.

The EPA has historically been a leader in national noise abatement efforts. They have been assisting other federal agencies, states, and local jurisdictions in the development of noise abatement programs.

The Department of Defense (DOD) operates two facilities in Orange County: the Marine Corps Air Station (MCAS) at El Toro and the one at Tustin. These bases, especially MCAS El Toro, have a significant noise impact on Laguna Niguel. In order to preserve the air station's mission as well as to protect surrounding communities, the Department of Defense established the Air Installations Compatible Use Zones (AICUZ) Program. The purpose of the AICUZ is to ensure compatible development in high-noise exposure areas, minimize public exposure to potential safety hazards associated with aircraft operations, and to protect the operational capability of the air installation. The Navy prepares a recommended AICUZ for each of its Naval or Marine Corps installations and submits its recommendations on zoning and land use to the local government for consideration. Presently, the 1981 AICUZ Study is implemented in Orange County. The 1981 AICUZ Study is expected to be updated in 1993.

The Department of Transportation is involved in noise setting standards and safety regulations for civil aviation, railroads, transit facilities and vehicles, and those freeways in the Interstate System. Other agencies under the Department of Transportation involved with the regulation of transportation related noise include: the Federal Aviation Administration, the Federal Railway Administration, the Urban Mass Transportation Administration and the Federal Highway Administration.

The State of California is responsible for establishing regulations for noise control where not preempted by the federal government. The State regulates noise emissions from motor vehicles, freeways and arterial roadways as it affects classrooms, and has set noise insulation standards for residential dwellings, hotels and motels. The State also has established noise impact boundaries around airports, and set noise planning standards for land use compatibility.

Local jurisdictions share responsibility of maintaining the health and welfare of their residents. This responsibility is largely implemented through land use planning and control. Since Laguna Niguel was primarily developed under the jurisdiction of the County of Orange, the County Noise Element, Land Use/Noise Compatibility Manual and the Noise Ordinance were used to determine land use compatibility with regards to noise sources. The City of Laguna Niguel has adopted its own Noise Ordinance to control local sources of noise. The Ordinance is largely based on the County Noise Ordinance.

IV. LAND USE COMPATIBILITY

The State Office of Noise Control has developed a Noise/Land Use Compatibility Matrix showing noise standards for various land use categories. The compatibility matrix is intended to provide guidelines for the development of municipal noise elements. Depending on the ambient environment of a particular community, these basic guidelines may be tailored to reflect existing noise and land use characteristics. The Noise Compatibility Matrix defines noise in terms of a community noise equivalent level (CNEL) expressed in decibel units (dB or dBA) that measure sound intensity. The CNEL measurement accounts for various noise levels which occur over a 24-hour period. Noise levels occurring during evening and nighttime hours are weighted more heavily than daytime noise in recognition of increased sensitivity to sound during these hours. A complete glossary of technical terms used in this Element is provided in Appendix A.

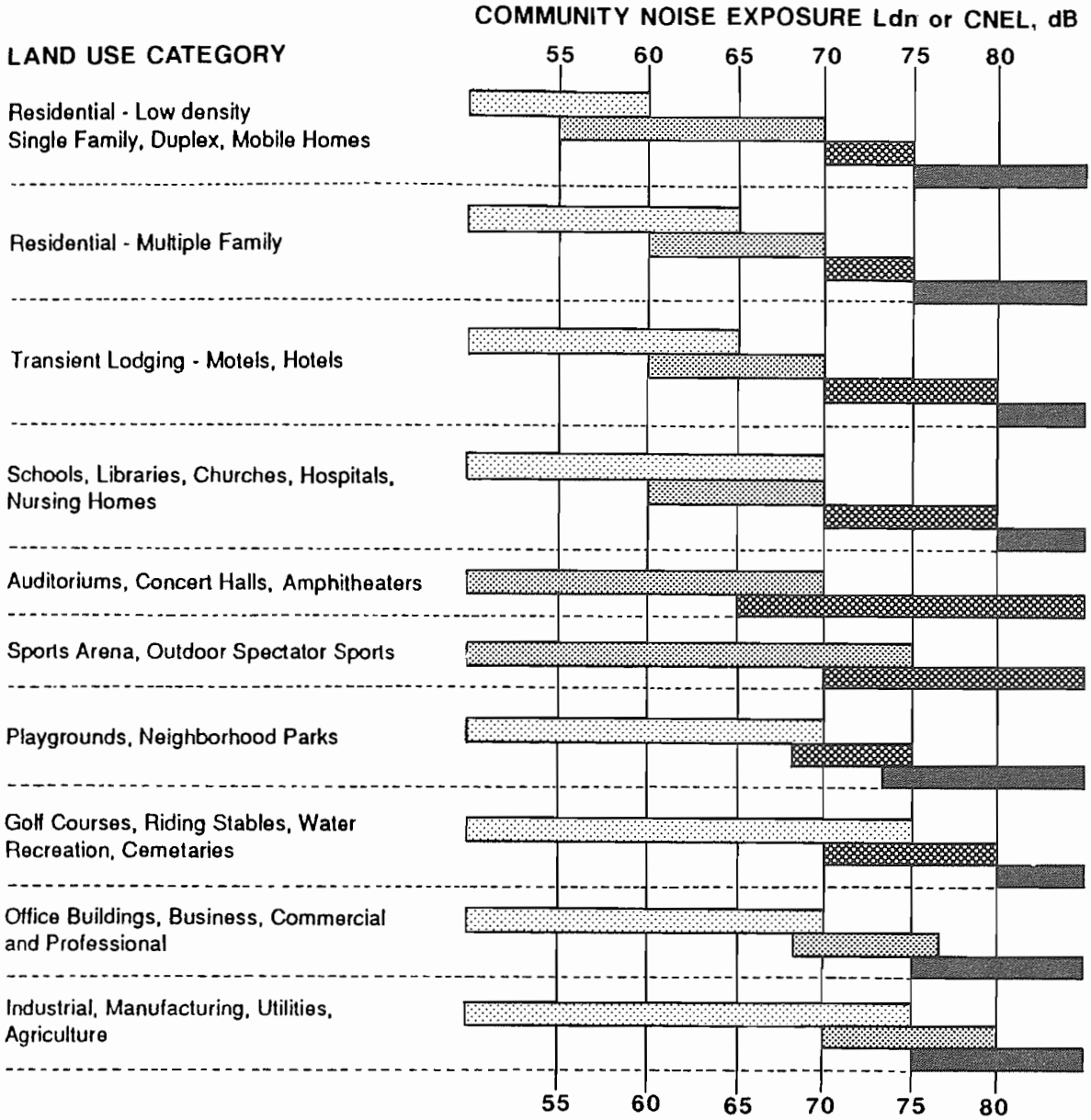
The Land Use Compatibility shown on Figure N-1 reflects the compatibility and the acceptable limits of noise for various existing and proposed land uses in Laguna Niguel. The matrix will be used as a guideline by the City to determine the compatibility of land uses within a certain noise environment. Standards for both sensitive and non-sensitive land uses are provided.

Land uses deemed noise sensitive by the State include schools, hospitals, rest homes, long-term care and mental care facilities. Many jurisdictions consider residential uses particularly noise sensitive because families and individuals expect to use time in the home for rest and relaxation, and noise can interfere with those activities. Some variability in standards for noise sensitivity may apply to different densities of residential development, and single family uses are frequently considered the most sensitive. Jurisdictions may identify other uses as noise sensitive such as churches, libraries, day care centers, hospitals, and parks.

A. Noise Insulation Standards

California noise insulation standards were officially adopted by the California Commission of Housing and Community Development in 1974 and 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 ruling states 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.

Land Use Compatibility for Community Noise Exposure



LEGEND

Normally Acceptable
Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Conditionally Acceptable
New construction or development should be undertaken only after a detailed analysis of the noise reduction requiremtnts is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice. Outdoor environment will seem noisy.

Normally Unacceptable
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made with needed noise insulation features included in the design. Outdoor areas must be shielded.

Clearly Unacceptable
New construction or development should generally not be undertaken. Construction costs to make the indoor environment acceptable would be prohibitive and the outdoor environment would not be usable.

SOURCE: CALIFORNIA OFFICE OF NOISE CONTROl

B. Community Noise

The most effective method to control community noise impacts from non-transportation noise sources is through application of a Community Noise Ordinance. Presently, the City of Laguna Niguel adopted a Noise Ordinance which is largely based on the County of Orange Noise Ordinance. This Ordinance is considered to be one of the most effective noise ordinances in California and is used by many jurisdictions in Orange County.

V. EXISTING NOISE ENVIRONMENT

A. Ambient Noise Measurements

As prerequisite to an effective noise control program, a community must be cognizant of the location and extent of local noise problems: namely major noise source locations, noise sensitive receptor locations and current levels of exposure. These data can then be utilized to focus noise control and abatement efforts where they are most needed. In some cases, the control of noise sources will be beyond the City's jurisdiction. However, by recognizing these limitations, more effective land use strategies can be developed.

Ten to fifteen minute noise measurements were taken during a typical week day at sixteen locations throughout the City of Laguna Niguel. Criteria for site selection included geographical distribution, land uses suspected of noisy activities, proximity to transportation facilities and sensitive receptor locations. Sites were chosen at worst-case noise locations throughout the City. The primary purpose of noise monitoring was to determine an existing profile for the study area that could be used for estimating the level of current and future noise impact.

Measurements represent motor vehicle noise emanating from Interstate 5, the local master planned roadway network and aircraft associated with MCAS El Toro. Sensitive receptor locations monitored include: single family and multi-family residential units, existing and proposed school sites, proposed senior center site, a childcare center, and the library. Noise levels were monitored during the peak traffic hour to represent maximum noise levels, or during off-peak conditions and then modified to reflect peak traffic conditions.

Table N-1 provides noise measurement data and site descriptions for the sixteen monitoring locations. As shown therein, noise levels exceeded the 60 dBA criteria (established for locating sensitive land uses) in all but three locations. Noise levels exceeded the 65 dBA criteria (for prohibiting residential development without adequate mitigation) at five of the sixteen locations. Four of these locations are noise sensitive receptors.

Table N-1
Ambient Noise Levels

Location	Measured Leq	Adjusted Leq	Day	Time	Land Use[1]	Description
1	75.4	75.4	11/6	4:30 p.m.	COM/ IND	Laguna Plaza between Camino Capistrano and Interstate 5
2	65.4	64.7	11/5	4:30 p.m.	SC	Proposed senior center site at the corner of Moulton Parkway and Aliso Creek
3	66.0	65.8	11/5	4:05 p.m.	S	Proposed school site at the corner of Niguel Heights and Alise Creek
4	67.3	67.3	11/6	4:10 p.m.	SFD	Single-family residence at the corner of Caballo and Paseo de Colinas
5	61.9	62.3	11/6	6:20 p.m.	SFD	Single-family residence at the corner of Highlands and Ridgeview
6	64.2	64.2	11/6	5:30 p.m.	SFD	Single-family residence on Paseo De Ocasa adjacent to Golden Lantern
7	60.4	60.4	11/6	5:00 p.m.	SFD	Single-family residence at the corner of Golden Lantern and Via Pasada
8	60.5	60.6	11/5	3:25 p.m.	S	Classroom building of Niguel Hills Middle School along Paseo de Colinas
9	68.0	68.0	11/5	5:15 p.m.	CC	Fenced playground of childcare center at the corner of La Plata and Crown Valley.
10	61.0	61.0	11/6	6:00 p.m.	OS	Crown Valley Community Park playing field adjacent to Crown Valley Parkway
11	67.4	67.5	10/30	4:30 p.m.	LIB	Crown Valley Library at 6 feet above grade
12	59.8	59.7	10/30	4:50 p.m.	SFD	Single-family residence at corner of Niguel & Paseo del Campo
13	61.8	61.8	10/30	5:05 p.m.	MFD	Multi-family residence on Chandon near corner of Marina Hills and St. Germain
14	59.2	59.2	10/30	4:10 p.m.	SFD	Single-family residence at corner of Pacific Island Drive & Talavera
15	55.9	55.9	10/30	5:25 p.m.	SFD	Single-family residence at corner of Ponders End and Beacon Hill
16	60.9	60.9	10/30	3:00 p.m.	S	Proposed school site at corner of Bear Brand and Camino del Avion

1 COM - Commercial; IND - Industrial; OS - Open Space; LIB - Library; SFD - Single Family Dwelling; MFD - Multiple Family Dwelling; CC - Child Care Facility; SC - Senior Center; S - School

Noise Measurements were recorded at eight residential sites. Noise levels exceeded 60 dBA at five of these sites. The highest noise measurement recorded at a residential site was 67.3 dBA.

In addition, 24-hour noise measurements were taken at four single family residences along Golden Lantern to develop improved baseline noise data for that area. Table N-2 provides noise measurement data for those four locations.

Table N-2
24-Hour Noise Measurements

Location	CNEL	Day	Land Use	Description
1	65.8	6/2-6/3	SFD	Golden Lantern between Crown Valley Parkway and Colinas
2	67.7	6/2-6/3	SFD	Golden Lantern between Colinas and Via de Anza
3	63.7	6/3-6/4	SFD	Golden Lantern between Crown Valley Parkway and Colinas
4	67.3	6/3-6/4	SFD	Golden Lantern between Crown Valley Parkway and Colinas

SFD = Single Family Dwelling

B. Significant Noise Sources

Two types of noise sources are considered in a community noise inventory: stationary sources and mobile sources. Stationary sources of noise include industrial and construction activities, farming equipment operations, shooting ranges, boating areas, air conditioning/ refrigeration units, drag strips, concert halls, loud whistles or bells, outdoor sporting events, loud radio, stereo or television usage, power tools, lawn mowers, home appliances and barking dogs. Mobile noise sources are typically transportation-related and include aircraft, trains, boats, automobiles, trucks, buses, motorcycles, and off-road vehicles.

There are a limited amount of stationary noise sources in Laguna Niguel. Most of the City's noisy industrial uses are located in the northeastern end of the City, away from residential uses. The most frequent stationary source of noise would be associated with construction activity. However, construction related noise is typically localized and temporary. Most of stationary sources of noise in the City are not considered a problem and are typically accepted as part of the ambient or background noise level.

Motor vehicles in the City are the dominant source of continous noise. Interstate 5, Crown Valley Parkway, Paseo de Colinas and Moulton Parkway/Golden Lantern carry appreciable volumes of commuter traffic. Land uses adjacent to these and other master planned roadways are potentially impacted by motor vehicle noise.

Other transportation facilities in the City that contribute to community noise levels include the Atchison Topeka and Santa Fe Railroad line and the United Marine Corps Air Station El Toro. The various sources of existing transportation noise generators are discussed separately in the following sections.

Roadways and Motor Vehicles

The City of Laguna Niguel is bisected by a number of arterial roadways. Interstate 5, the largest transportation corridor in the area, is located along the northeastern edge of the City. The major and primary north-south roadways in Laguna Niguel are Alicia Parkway, La Paz Road, Moulton Parkway/Golden Lantern, Niguel Road and Crown Valley Parkway. The

primary east-west roadways are; Paseo de Colinas, Marina Hills Drive, Camino del Avion and Aliso Creek Road.

The highway traffic noise prediction model developed by the Federal Highway Administration (RD-77-108) was used to evaluate existing noise conditions in Laguna Niguel. This model utilizes various parameters including the traffic volume, vehicle mix and speed, and roadway geometry, to compute typical equivalent noise levels during daytime, evening and nighttime hours. The resultant noise levels are then weighted and summed over 24 hourly periods to determine the daily Ldn value. Noise contours are derived through a series of computerized iterations to provide the 60, 65, and 70 CNEL locations. These contour locations can be used as a planning tool to locate noise sensitive receptors away from major noise generators. Figure N-2 depicts the existing CNEL contours. The 60 and 65 CNEL contours extend farthest fom the roadway centerline along Crown Valley Parkway, and Moulton Parkway/Golden Lantern due to higher traffic volumes. Residential uses along these roadways have outdoor living areas that may be impacted with noise levels between 60 and 65 dBA CNEL. Projected increases in traffic along these roadways will extend the 60 and 65 CNEL further into these residential areas. Table N-3 reflects the CNEL range at 100 feet from the centerline for major roadways in the City.

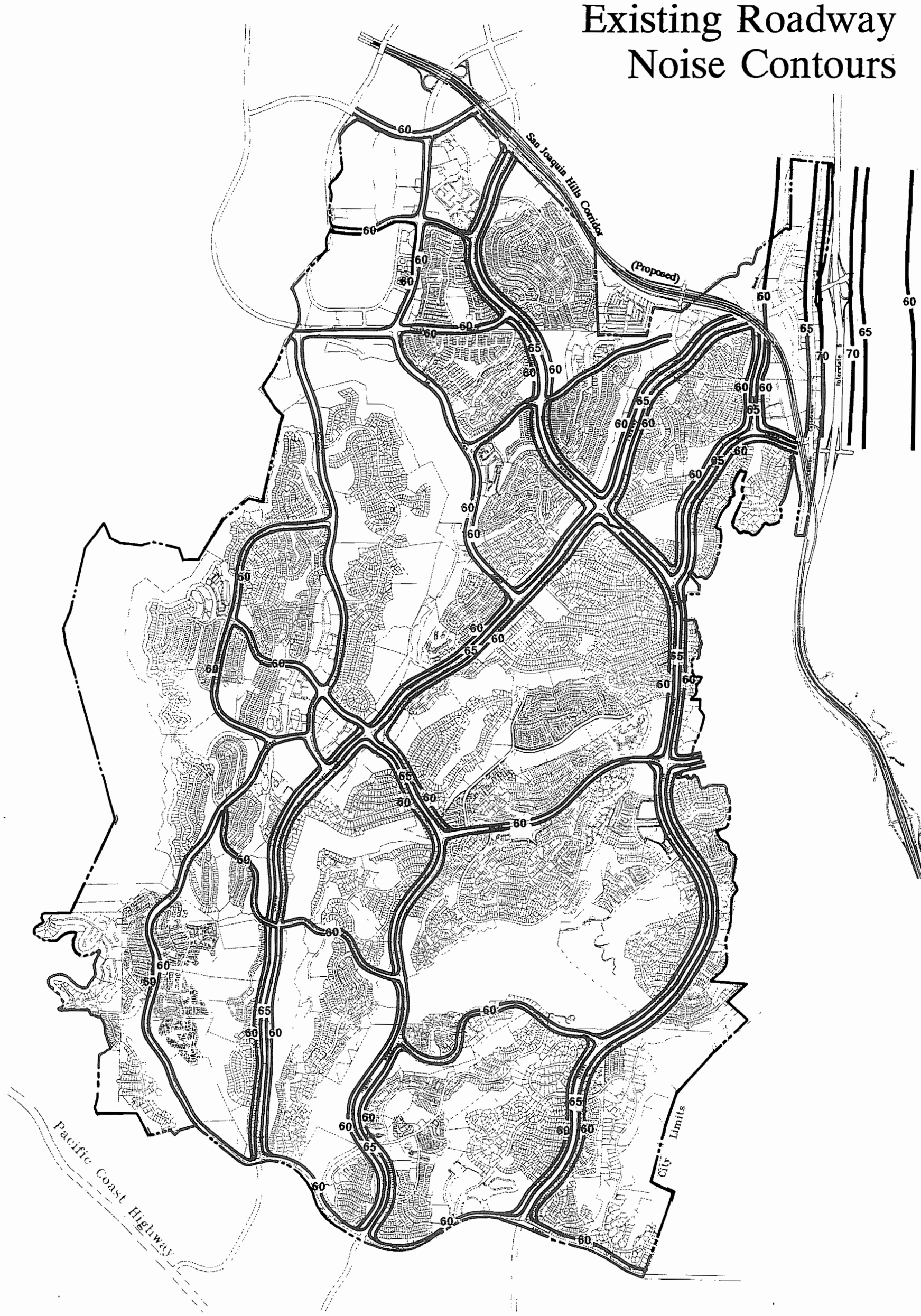
Table N-3
Existing CNEL Range at 100 Feet from Centerline

Roadways	CNEL Range
Pacific Island Drive	58.2 - 61.8
Highlands	53.9 - 54.3
Alicia Parkway	62.5 - 63.0
Niguel Road	57.9 - 65.4
La Paz Road	61.8 - 66.5
Golden Lantern	66.2 - 67.9
Moulton Parkway	65.4 - 66.0
Paseo de Colinas	57.9 - 65.0
Pacific Park	50.8 - 61.2
Aliso Creek	60.7 - 65.0
Rancho Niguel	55.2 - 61.2
Crown Valley Parkway	65.8 - 68.5
Marina Hills	62.2 - 62.6
Camino del Avion	61.3 - 64.5
Cabot Road	49.5 - 61.8

Airport and Aircraft

MCAS El Toro is currently one of the largest Marine air station facilities in the western United States. The Air Station is located within Orange County, approximately 7 miles from the City of Laguna Niguel. Both fixed-wing aircraft and helicopters are flown at El Toro. However, as a noise source, fixed-wing jets are the greatest contributor of aircraft noise in the City. Table N-4 summarizes the total annual jet operations by aircraft type.

Existing Roadway Noise Contours



The City of
LAGUNA NIGUEL
General Plan

Job: LAG:04P
Date: FEBRUARY 11, 1992
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Table N-4
Projected MCAS El Toro Annual Jet Operations by Aircraft Type

Aircraft	Departures	Arrivals	Patterns[1]	Totals
F-18	20,068	20,068	21,790	**61,926**
Heavy Jet	385	385	0	**770**
Other Jet	839	839	813	**2,491**

1. Patterns include overhead break, Field Carrier Landing Practice, and touch-and-go. One ground loop is counted as one pattern.

The F-18 is the dominant aircraft type at MCAS El Toro, both in terms of numbers of operations and noise produced. Runways 07L/R and 34R are the runways used over 90 percent of the time by F-18's for departures and arrivals, respectively. As shown in Figure N-3, these arrival and departure flight paths are located directly over Laguna Niguel. Some of the flight paths used by other MCAS aircraft also overfly Laguna Niguel.

Three patterns were used for noise contour modelling: Touch and Go's, Field Carrier Landing Practice (FCLP)--daytime, and FCLP--night. Each pattern consists of a short, 300 foot ground roll, use of military power to climb to pattern altitude, power cut back and turn to downwind, and a descending turn to final. Each pattern has a different pattern altitude from mean sea level (MSL):

Touch and Go	1,500 feet MSL
FCLP--Daytime	900 feet MSL
FCLP--Nighttime	1,200 feet MSL

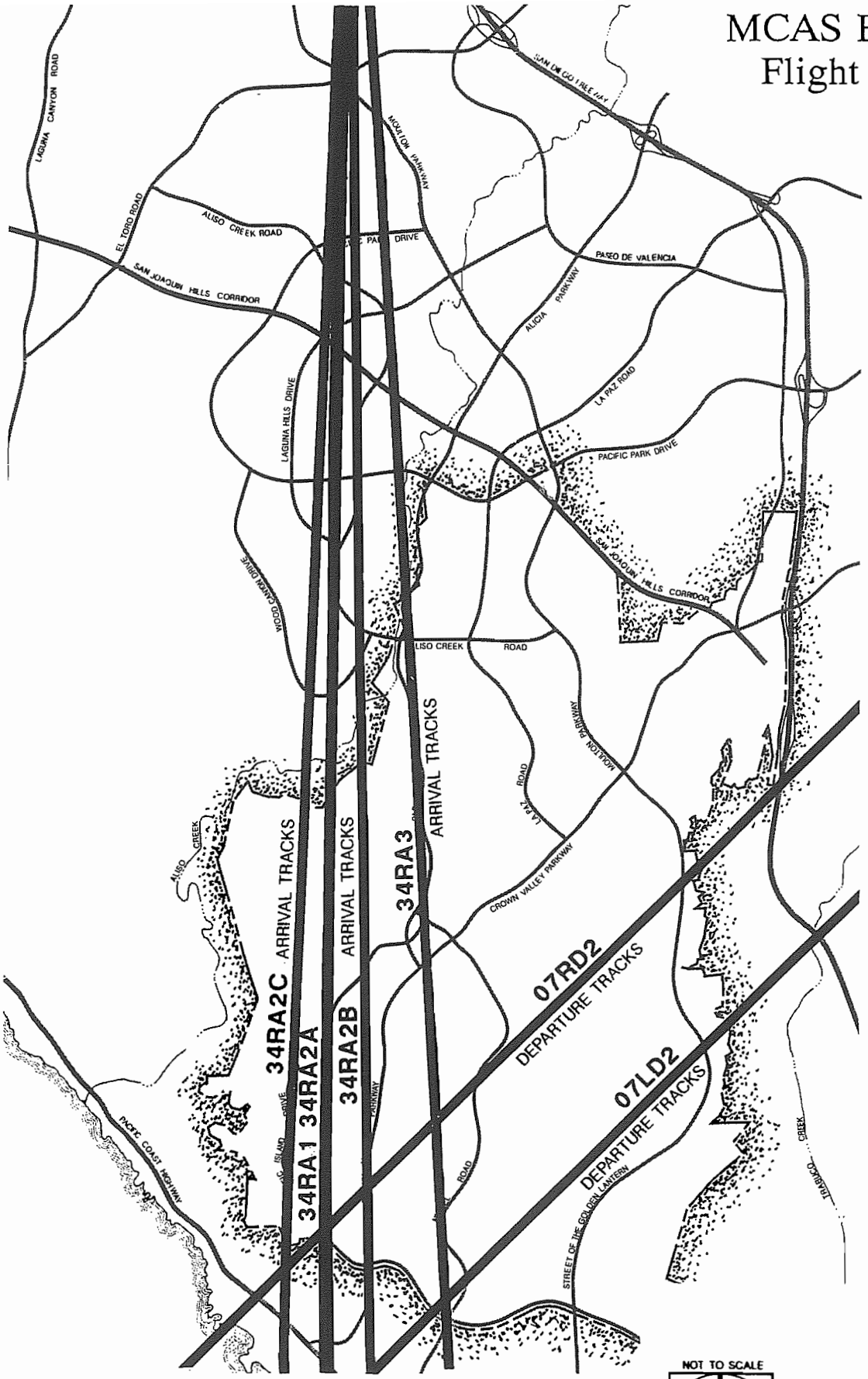
Figure N-4 depicts the 1981 AICUZ Noise Contours from MCAS El Toro. This figure indicates that the 60 dB CNEL extends through the northwestern part of the City parallel with the arrival of flight tracts. Several residential uses located in this area are subject to overhead aircraft noise. However, most of the residential uses have been provided with mitigation to achieve the required indoor noise standard of 45 dB CNEL. The 65 dB CNEL is located outside the City.

Figure N-4 does not reflect any noise contours along the departure flight tracts that extend through the southwestern portion of the City. The aircraft is flying at a height of at least 9,000 feet along the departure tract. At this height the noise that can be heard from the aircraft is minimal.

Railroad and Trains

One rail line runs through the City of Laguna Niguel, paralleling the Interstate 5 Freeway. The Atchison Topeka and Santa Fe (AT & SF) line passes through the eastern edge of the City on its path from Los Angeles to San Diego, carrying both freight and passenger trains. The freight train carries cargo from Fullerton. The San Diego run passenger train is AMTRAK which supports the local commuter network, stopping in Anaheim, Santa Ana, Irvine, San Juan Capistrano, San Clemente, and Oceanside. Table N-5 provides a breakdown of the rail operations that occur along these two lines.

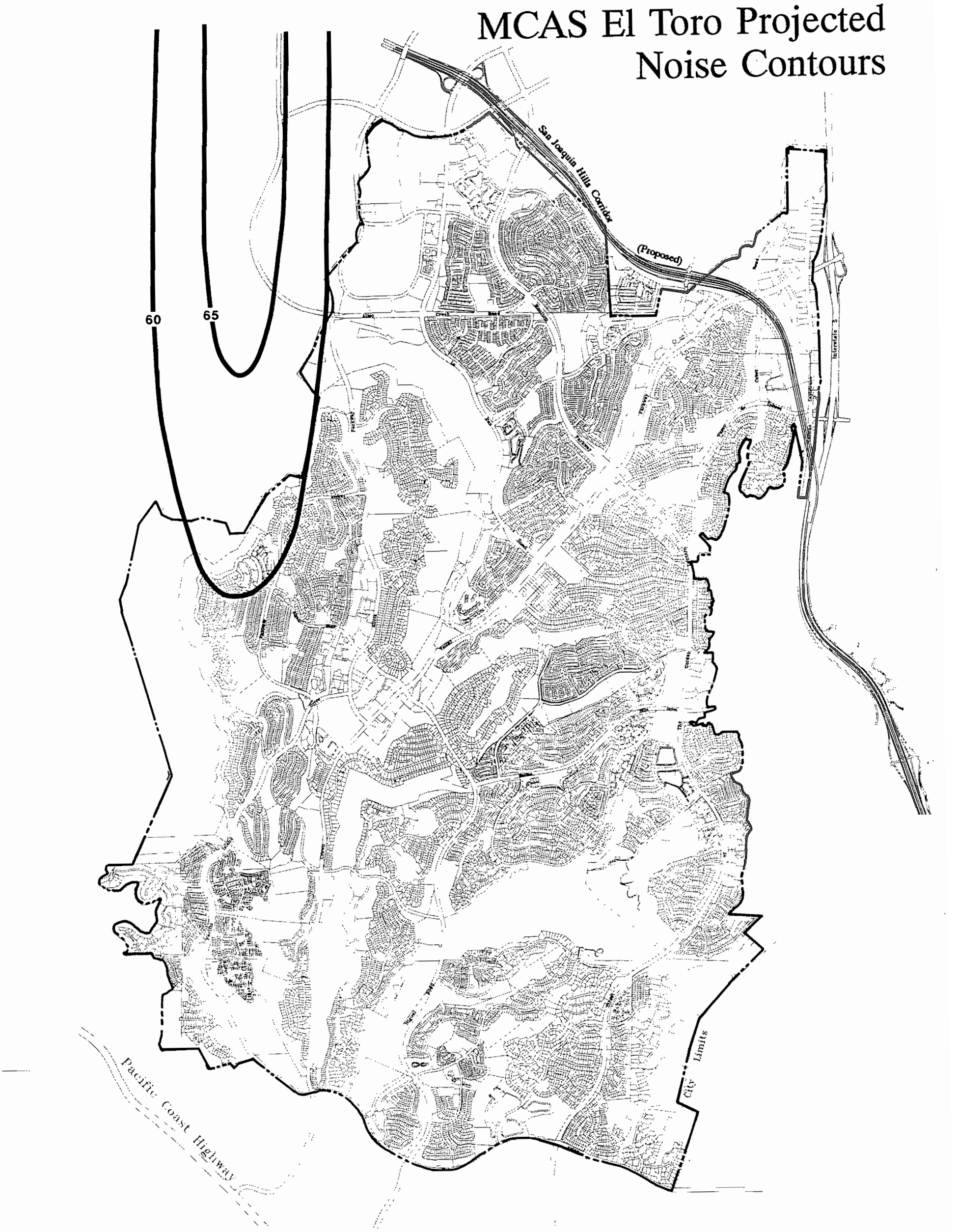
MCAS El Toro Flight Tracks



The City of
LAGUNA NIGUEL
General Plan

N-3

MCAS El Toro Projected Noise Contours



The City of
LAGUNA NIGUEL
General Plan

Job: LAG-04P
Date: FEBRUARY 11, 1992
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Table N-5
Railroad Operational Data
(1991 Operations)

Railway Segment	No. of Trains/Day	Train Length (Feet)	Distribution Day/Evening/Night	Speed
AT&SF Freight	2	5,500	50%/50%/0%	55 mph
AMTRAK	14	620	71%/14%/14%	90 mph

The noise exposure contours along the railway tracks were interpreted with the Wyle Laboratories train noise methodology model. The contours were determined from the number and type of trains using the line, the magnitude and duration of each train pass, and the time of day the operation occurs. The noise contours at 100, 200, 400 and 800 feet from each of these railway lines is reflected in Table N-6.

Table N-6
Train Noise Contours

Railway Line	Noise Level (Ldn) at			
	100 feet	200 feet	400 feet	800 feet
AT&SF Freight	63.3	59.3	54.3	49.3
AMTRAK	65.4	61.4	56.4	51.4

As shown in Table N-6, the AMTRAK trains create the largest noise contours of the two trains operating in the City. However, the closest noise-sensitive land use in the area is located approximately 400 feet west of the railroad line. At this distance the CNEL would be less than 57 dB CNEL. Thus, no significant noise impacts to sensitive land uses are projected to occur from train operations.

VI. SENSITIVE RECEPTORS

The City of Laguna Niguel has a number of noise sensitive land uses. These uses include: residential areas, school sites, child care areas, library, parks and a senior center site. Figure N-5 depicts the locations of schools and other sensitive noise receptors that are located within areas that are affected with noise levels of at least 60 dB CNEL.

Many of the residential uses in Laguna Niguel are within neighborhood enclaves. These areas are typically located away from major transportation corridors. However, there are residential areas that have rear and front yards adjacent to arterial roadways. Some of these areas are impacted with traffic noise that is in excess of City standards.

There are five existing and six proposed school sites in Laguna Niguel. The majority of the school sites are located or planned along major arterials and are, therefore, impacted by traffic noise.

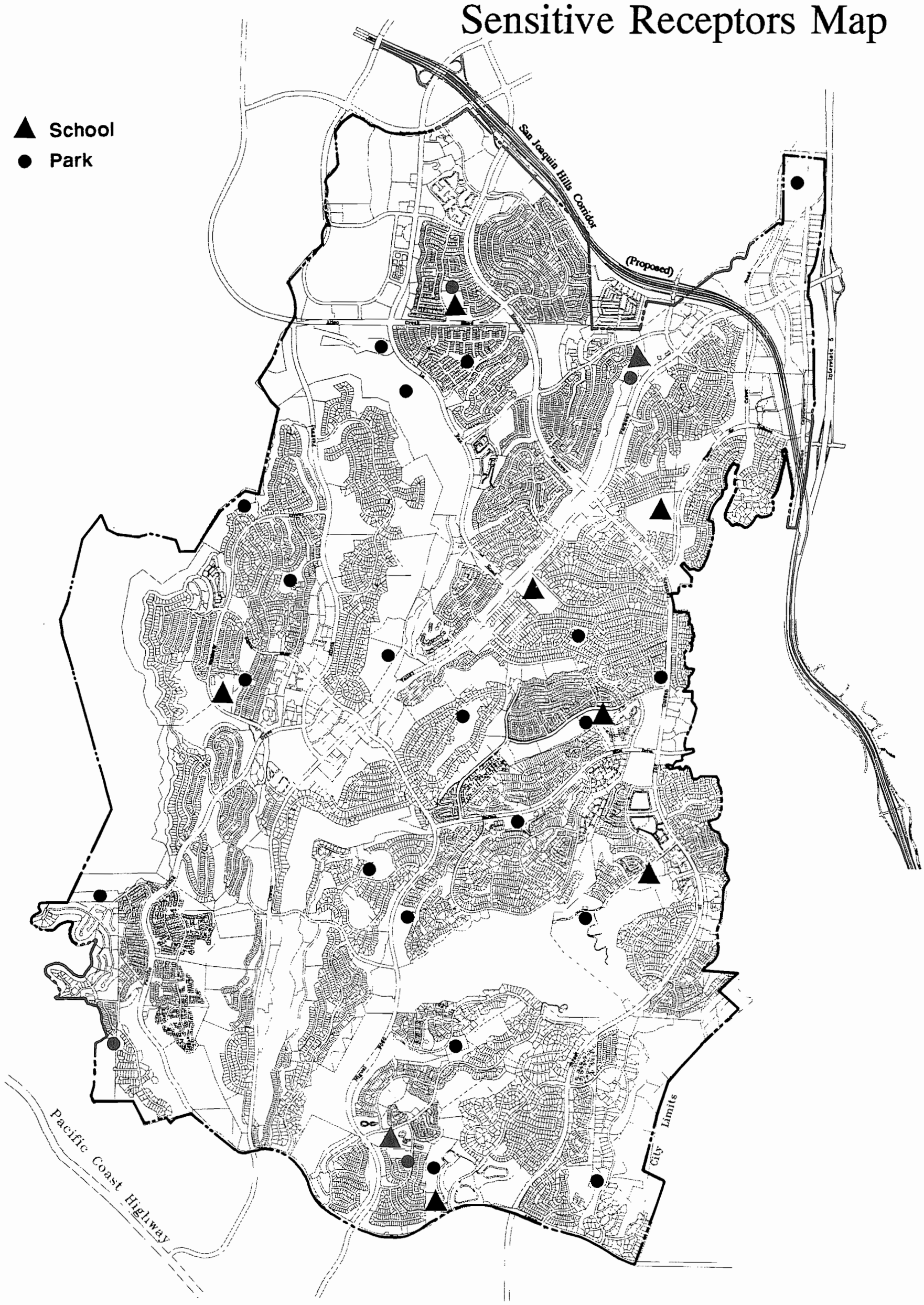
Four public park sites, Crown Valley Community Park, Hidden Hills Park, Marina Hills Park and Rancho Niguel Park are located along major arterials. These park sites are impacted by noise levels in excess of 65 dB CNEL. The remaining park sites in the City are situated along secondary or collector roadways. These areas are not subject to high levels of traffic-related noise.

Other noise sensitive land uses located along major transportation corridors include proposed senior center site at the corner of Moulton Parkway and Aliso Creek Road, and a childcare center and Crown Valley Library on Crown Valley Parkway. Portions of both of these sites are above 65 dB CNEL.

The planned alignments of the San Joaquin Hills Transportation Corridor and Moulton Parkway will be future sources of traffic noise. Both of these transportation facilities will affect noise-sensitive land uses within the immediate vicinity. The implementation of site specific sound attenuation measures would ensure that these transportation facilities do not exceed the exterior and interior noise standards for nearby residential uses. Laguna Niguel should coordinate closely with the County of Orange to ensure that the San Joaquin Hills Transportation Corridor and Moulton Parkway are in compliance with City noise standards. Additional information regarding the San Joaquin Hills Corridor and Moulton Parkway is presented on pages 22 and 23 of this Element.

Overhead aircraft flights from El Toro are expected to occur in the future and may change with the operational mission of the air base. Noise-sensitive land uses in the City will continue to be affected by aircraft operations.

Sensitive Receptors Map



The City of
LAGUNA NIGUEL
General Plan

N-5

VII. FUTURE NOISE ENVIRONMENT

The major source of future noise will come from automobiles and trucks traveling on existing and proposed roadways and transportation corridors in the City. Other future sources of noise include overhead aircraft from MCAS El Toro and from rail traffic on the AT&SF Railroad. Future sources of noise should be considered during the planning process.

A. Major Roadways

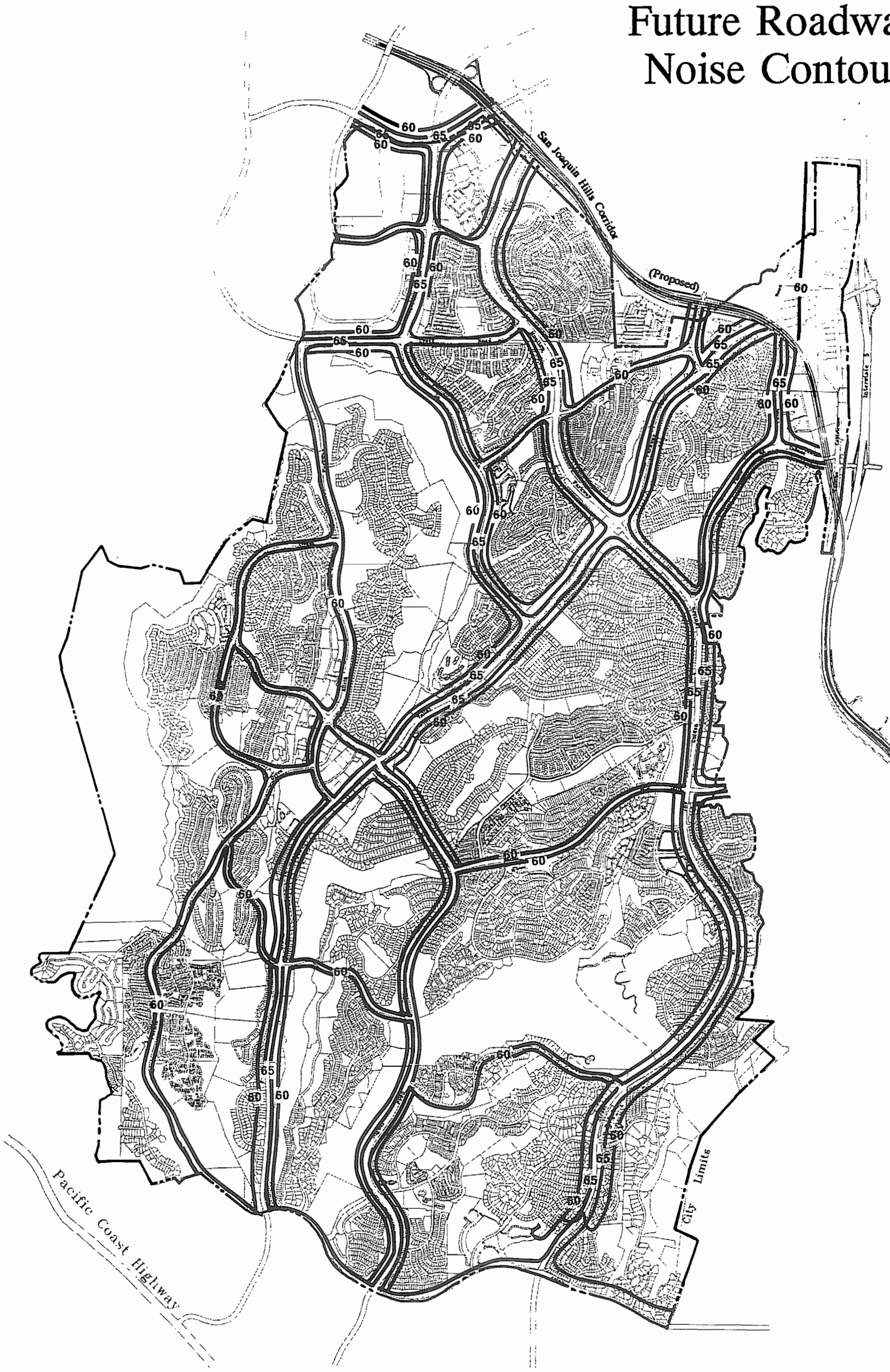
Future unattenuated noise levels along roadways are shown in Figure N-6. Noise levels are mapped using contour lines indicating a specific noise level that there is no shielding from existing barriers or topography from traffic noise is assumed.

As shown on Table N-7, most of the roadways in Laguna Niguel are projected to have noise levels that are below 65 CNEL at 100 feet from the centerline. However, segments of Alicia Parkway, Niguel Road, La Paz Road, Golden Lantern, Moulton Parkway, Pacific Park Drive, Aliso Creek, Crown Valley Parkway, Marina Hills Drive, Paseo de Colinas, Cabot Road and Greenfield Drive would all experience noise levels of 65 CNEL at 100 feet from the centerline. Compared to existing CNELs, most of the roadways will experience less than a 3 dBA increase over existing noise levels, the level that is discernable by adjacent receptors. Roadways with the largest decibel increase include portions of Pacific Island Drive, Highlands Avenue, Moulton Parkway, Golden Lantern, Pacific Park Drive, Avila Road, Aliso Creek Road, and Camino del Avion. The increases associated with these roadways are primarily related to the amount of new development occurring in the area. Traffic noise along the roadways could be mitigated to adequate levels with a combination of landscaped barriers, sound walls and architectural sound attenuation measures.

Figure N-6 depicts the projected CNEL contours for major roadways in Laguna Niguel. The 65 CNEL contour extends furthest into adjacent land uses along Moulton Parkway, Golden Lantern and Crown Valley Parkway. This results from relatively high daily traffic volumes and high vehicle speeds along these roadways.

Along Moulton Parkway, the 65 CNEL extends between 165 feet and 190 feet from the centerline. However, landscaped barriers and sound attenuation walls are generally present to help mitigate traffic noise levels. In some areas, existing noise attenuation features would not adequately reduce future noise levels. Portions of the large undeveloped County Village Parcel located on the east side of Moulton Parkway between Aliso Creek road and Pacific Park Drive could be impacted by noise levels of 65 dBA or greater. Site specific acoustical studies and sound attenuation measures should be incorporated into the planning process for this area to ensure that adequate noise levels are achieved.

Future Roadway Noise Contours



The City of
LAGUNA NIGUEL
General Plan

Job: LAG-04P
Date: FEBRUARY 11, 1992
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Table N-7
Future CNEL Range at 100 Feet from Centerline

Roadways	CNEL Range
Pacific Island Drive	59.2 - 62.2
Highlands	53.9 - 58.0
Alicia Parkway	64.2 - 65.6
Niguel Road	56.9 - 66.4
La Paz Road	64.0 - 68.3
Street of the Golden Lantern	68.7 - 70.0
Moulton Parkway	68.3 - 68.8
Pacific Park Drive	68.5 - 69.0
Aliso Creek	64.0 - 66.0
Rancho Niguel	57.0 - 66.0
Crown Valley Parkway	67.1 - 69.6
Marina Hills Drive	63.7 - 66.7
Camino del Avion	64.4 - 66.4
Paseo de Colinas	59.0 - 65.6
Cabot Road	63.7 - 65.2

The 65 CNEL extends along Golden Lantern between 180 feet and 215 feet from the centerline. There are many residential uses along Golden Lantern that could be affected by traffic noise. Landscaped barriers and sound attenuation walls should help mitigate traffic noise; however, without site specific studies that consider existing noise barriers and local topography, it is not possible to accurately project the future noise environment of residential uses. Many of the outdoor living areas of residences that are adjacent to the roadway are affected by noise levels above 65 CNEL and those noise levels are projected to increase.

The 65 CNEL extends between 140 feet and 200 feet from the centerline of Crown Valley Parkway. However, most of the residential uses are sufficiently setback to mitigate noise levels to acceptable levels. In conjunction with the setbacks, sound attenuation measures have been incorporated into the construction of many residential uses.

Laguna Niguel has little control of transportation noise at the source. State and federal agencies have the responsibility to control vehicle emission noise levels. The most effective method the City has to mitigate traffic noise is through effective site planning and the construction of noise barriers. Proposed development should consider future traffic noise during the planning process. Mitigation measures should be incorporated into development projects, when necessary, to ensure that adequate noise levels are achieved.

B. Moulton Parkway/Street of the Golden Lantern

The proposed improvements would consist of six lanes through most of Laguna Niguel. Additional right-of-way may be needed to accommodate the construction of the six lanes. Almost the entire length of the street in the City will extend through residential areas. Further information regarding the alignment of the street is presented in the Circulation Element.

The future traffic volumes projected along Moulton Parkway/Golden Lantern indicate that several existing and future residential uses could be impacted by noise levels above 65 CNEL. The improvements to Moulton Parkway and Golden Lantern would result in greater traffic volumes at higher speeds with a related increase in noise levels. Many of the noise impacts associated with the improvements could potentially be mitigated through the construction of noise barriers at the top of slopes (rather than adjacent to the roadways) and the incorporation of architectural sound attenuation measures into existing residences. Laguna Niguel will closely coordinate with the County of Orange on the planning and environmental documentation for the Moulton Parkway/Street of the Golden Lantern improvements to ensure that adequate noise attenuation is provided for residents in the area.

C. San Joaquin Hills Transportation Corridor

The San Joaquin Hills Transportation Corridor (Corridor) is a future 19 mile multi-modal transportation corridor that will extend from the City of Newport Beach to the City of San Juan Capistrano connecting Interstate 5 to the existing State Route 73 freeway. Approximately 5.5 miles of the Corridor is located within or adjacent to Laguna Niguel. The Corridor will primarily extend through areas within the City that contain non-sensitive land uses. However, a few residential areas will be close to the Corridor.

The Corridor consists of three to five general purpose travel lanes in each direction (depending on the reach of the Corridor). One auxiliary lane in each direction for traffic merging on and off. The corridor alignment will include steep grades where required. A 64-foot median is provided to accommodate one high occupancy vehicle lane in each direction. There are three interchanges proposed just north of the City's boundary. The first interchange is planned on Moulton Parkway near Pacific Park Drive, the second interchange is on La Paz Road north of Pacific Park Drive, and the final interchange is located at Greenfield Drive near Crown Valley Parkway. A more detailed description and cross-section view of the corridor is provided in the Laguna Niguel Circulation Element.

The San Joaquin Hills Transportation Corridor EIR/EIS recorded post-2010 noise levels at eight different locations in Laguna Niguel. Existing noise measurements were taken at locations adjacent to or within the immediate vicinity of the corridor. The analysis indicates that of the eight locations measured, seven would be impacted from noise in excess of 67 dBA Leq. The Federal Department of Transportation and the California Department of Transportation (CALTRANS) both use 67 Leq as the maximum allowable noise level for residential uses. This standard closely corresponds to the County of

Orange's residential standard of 65 dB CNEL. The EIR/EIS requires that a series of barriers ranging from 8 to 16 feet be provided to mitigate noise impacts to acceptable levels.

Figure N-7 identifies the locations within and adjacent to the City, where noise measurements were recorded and where noise barriers are proposed. Table N-8 indicates the projected noise levels before mitigation, the recommended noise barrier heights and the projected noise levels after mitigation. The precise location and description of each mitigation measure is provided in the San Joaquin Hills Transportation Corridor Environmental Impact Report.

Table N-8 indicates that all of the residential sites, except for Site 5, can be mitigated to 67 dBA Leq. Site 5 is situated within in a predominantly single family residential area. Eight houses in the area would be impacted with noise in excess of 67 dBA Leq. An eighteen foot barrier would be needed to break the line of sight of the corridor. The height of this barrier is not feasible, and it would still not provide sufficient mitigation. The EIR/EIS requires that a barrier be provided at the property line.

The height of the barrier is to be determined during the preliminary design of the corridor, subject to approval of the property owners.

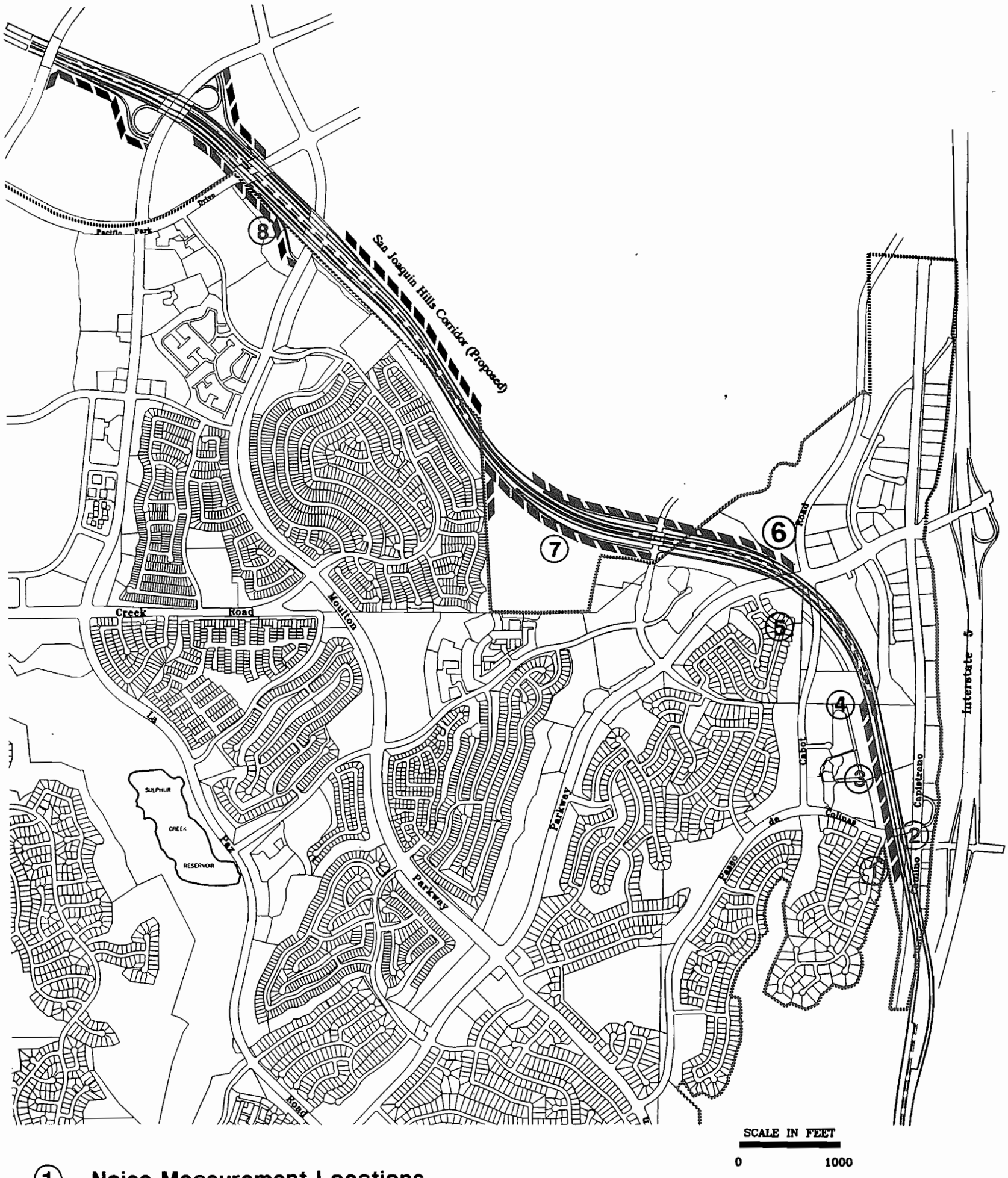
No mitigation is proposed at Site 2. This site is flood control property and designated open space. No noise sensitive land uses would be impacted.

Table N-8
Projected SJHTC Noise Levels
and Recommended Mitigation

Site	Land Use	Projected Leq Noise Level Without Mitigation	Recommended Barrier Heights	Projected Leq Noise Level With Mitigation
1	Residential	74 dBA	6′	66 dBA
2	Open Space	73 dBA	No mitigation required	73 dBA
3	Residential	68 dBA	10′	63 dBA
4	Residential	65 dBA	16′	60 dBA
5	Residential	69 dBA	Unknown	*
6	Open Space	71 dBA	10′	65 dBA
7	Residential	72 dBA	8′	66 dBA
8	Residential	73 dBA	8′	59 dBA

* Subject of Future Study.

Noise Measurement Locations and Recommended Mitigation



① Noise Measurement Locations

Noise Barrier Wall

SOURCE: San Joaquin Hills Transportation Corridor EIR/EIS

D. Airport and Aircraft

The 1981 AICUZ Noise Contours are shown on Figure N-4. At this time there are no projected noise contours to reflect the future operations of USMC El Toro. The 1981 AICUZ noise contours are expected to be revised during the next AICUZ update in 1993. Future flight operations at USMC El Toro will involve greater use of the F-18 Fighter Jet. However, it is anticipated that noise contours through Laguna Niguel will not significantly change.

E. Railroad and Trains

The projected level of railroad activity in the City is expected to increase. The most significant increase will most likely be the number of AMTRAK trips along the existing AT&SF line. Local transportation and air quality agencies are promoting train travel for commuters who are currently traveling along I-5. This, combined with the natural population growth in southern Orange County, should increase the demand for AMTRAK trips.

The level of freight activity in the City is not expected to increase significantly in the future according to representatives from AT&SF. However, rail traffic will respond to market demand and may increase or decrease depending on future industrial development along the line. At this time railroad officials are unable to project the frequency of future rail activity.

Given the distance between the railroad line and noise-sensitive land uses, the increased train activity could potentially effect existing and future land uses in the area. A site-specific noise analysis should be required for any future noise-sensitive uses proposed in the immediate area of the railroad line.

VIII. GOALS, POLICIES AND ACTIONS

Goal 1

Establishment of exterior and interior noise environments for land uses that will protect citizens from excessive noise.

Intent

It is the intent of this section to provide noise standards for land uses in Laguna Niguel. These standards ensure the compatibility of land uses with their existing and future noise environments.

Policy 1.1 Discourage noise sensitive land uses in noisy exterior environments unless measures can be implemented to reduce exterior and interior noise to acceptable levels. Alternatively, encourage less sensitive uses in areas adjacent to major noise generators but require appropriate interior working environments.

Action

1.1.1 Incorporate measures into all development projects to attenuate exterior/interior noise levels to acceptable levels. The City's noise standards for land use compatibility are provided in Table N-9. These standards shall be adhered to and implemented during the review of all proposed development projects.

Table N-9
Land Use with Noise Standards

Land Use	Interior Standard	Exterior Standard
Residential Detached Residential Attached	45	65
Neighborhood Commercial Community Commercial	--	70
Professional Office	50	70
Community Commercial/ Professional Office	--	70
Industrial/Business Park	55[1]	75
Professional Office/Industrial/Business Park Industrial/Business Park/Professional Office/Community Commercial	--	75
Public/Institutional Public Institutional/Professional Office	50	70
Schools	50[2]	65[2]
Parks and Recreation	--	70

Notes: 1. Where quiet is a basis for use.
2. In interior or exterior Classroom Areas during school operating hours.

Goal 2 **Land use planning that provides for the separation of significant noise generators from sensitive receptor areas.**

Intent The separation of noise generators from sensitive receptors will result in an exterior environment that requires minimal mitigation to meet acceptable noise levels. Proper planning will ensure that sensitive receptors are not impacted by noise hazards by locating these land uses distant from each other. Noise hazard areas will be considered to include locations within the 65 CNEL contour of master planned roadways, railroad corridors, aircraft flight paths, and industrial facilities.

Policy 2.1 Locate noise tolerant land uses in areas currently impacted by noise, such as adjacent to master planned roadways or within the contours of the United States Marine Corps Air Station at El Toro.

Policy 2.2 Ensure that current noise hazard areas in the City are identified, quantified, and mapped in a form that is available to decision makers.

Action

2.2.1 Require a revision to the noise contour map with every General Plan Update.

Policy 2.3 Utilize the information from the noise contour map in the General Plan in the development review process to ensure that noise sensitive land uses are not located near major stationary noise sources.

Policy 2.4 Minimize noise conflicts between land uses and the circulation network.

Action

2.4.1 Consider noise mitigation measures in the design of all future streets and highways and when improvements occur along existing highway segments. Measures will emphasize the establishment of buffers between roadways and adjoining noise sensitive areas.

Goal 3 **Promote the control of noise between land uses.**

Intent Exterior and interior noise standards determine the design and location of land uses. There is also the opportunity to control noise between land uses through the implementation of the City's Noise Ordinance. The Noise Ordinance discusses general community noise levels that "unreasonably disrupt the peace and quiet" of the community. Standards are provided in the Ordinance that

establish maximum noise levels during specific time periods when the uses are most sensitive to noise.

Policy 3.1 Limit the maximum permitted noise levels which cross property lines and impact adjacent land uses.

Action

3.1.1 Implement the City's Noise Ordinance to regulate noise for various land use categories and for sensitive time periods.

Goal 4 The control of noise from significant noise generators in the community.

Intent Noise can be controlled in three areas: 1) at the source with muffling techniques; 2) at the receptor through the use of architectural treatments, walls and landscaping; or 3) along the noise path with the insertion of sound barriers. The most effective means of reducing noise is by controlling it at its source. The intent of this goal is to reduce noise in the community through source-related controls.

Policy 4.1 Regulate noise from construction activities.

Action

4.1.1 Enforce the Noise Ordinance for all non-emergency construction operations.

Goal 5 The consideration of noise issues in the planning process.

Intent Noise issues should always be considered during the planning process so that needed measures are incorporated in design and location of land uses. In addition, the economic impact of noise attenuation measures can then be incurred by the property developer and not future owners who may not anticipate noise impacts.

Policy 5.1 Evaluate potential noise conflicts for individual sites and projects.

Actions

5.1.1 During review of development applications, consider noise impact of the proposed land use on the existing and future noise environment of existing or planned contiguous uses.

5.1.2 Require proposed noise producing projects to have an acoustical engineer prepare a noise analysis with recommendations for special design measures if the project is to be located close to existing or planned noise sensitive land uses.

5.1.3 Require proposed noise sensitive projects within noise impacted areas to have acoustical studies prepared by a qualified acoustical engineer and to provide special design measures to protect noise sensitive uses from ultimate projected noise levels.

5.1.4 For projects close to master planned roadways, utilize the ultimate roadway capacity at Level-of-Service D and the posted speed limit to estimate maximum future noise impacts.

5.1.5 Discourage projects that are incapable of successfully mitigating excessive noise.

Policy 5.2 Require mitigation of all significant noise impacts as a condition of project approval.

Actions

5.2.1 Consider site design techniques as the primary means to minimize noise impacts.

- Utilize building setbacks to increase the distance between the noise source and receiver.
- Promote the placement of noise tolerant land uses such as parking lots, maintenance facilities, and utility areas between the noise source and receptor.
- Orient buildings to shield outdoor spaces from a noise source. Quiet outdoor spaces can be provided by creating a U-shaped development which faces away from the roadway or by clustering land uses.

5.2.2 Require developers to consider alternative architectural layouts as a means of meeting noise reduction requirements.

- Place bedrooms on the side of the house facing away from major roadways. The use of noise tolerant rooms such as garages, bathrooms and kitchens to shield noise-sensitive areas will be encouraged.
- When bedrooms cannot be located on the side of a house away from a major roadway, require extra insulation and double-pane windows.
- Avoid balconies facing major travel routes. Development proposals including balconies in the design will need to be evaluated for potential noise impacts during the environmental review process.

APPENDIX A
GLOSSARY OF TERMS (CONT.)

Intrusive Noise: That noise which intrudes over and above the ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, time of occurrence, and tonal or informational content as well as the prevailing ambient noise level.

L10: The A-weighted sound level exceeded 10 percent of the sample time. Similarly L50, L90, L99, etc.

Noise: Any unwanted sound or sound which is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying. The State Noise Control Act defines noise as "...excessive undesirable sound..."

Noise Attenuation: The ability of a material, substance, or medium to reduce the noise level from one place to another or between one room or another. Noise attenuation is specified in decibels.

Noise Barrier: A structure designed to mitigate the impact generated by a noise source (.e.g., an arterial or rail line) at an adjacent noise sensitive location. Barriers should be continuous structures (without gasps) and should be constructed of a material that is impervious to noise (e.g., concrete block, stucco-on-wood, wood-on-wood, 1/4" tempered plate glass, earthen berm, or any combination of these materials).

Noise Exposure Contours: Lines drawn around a noise source indicating constant or equal level of noise exposure. CNEL and LDN are typical metrics used.

Noise Impact Area: A specific area exposed to significant levels of noise.

Noise Reduction: The ability of a material to reduce the noise level from one place to another or between one room and another. Noise reduction is specified in decibels.

Noise Referral Zones: Such zones are defined as the area within the contour defining a CNEL level of 60 decibels. It is the level at which either State or Federal laws and standards related to land use become important and, in some cases, preempted local laws and regulations. Any proposed noise sensitive development which may be impacted by a total noise environment of 60 dB CNEL or more should be evaluated on a project specific basis.

Noise Sensitive Land Use: Noise-sensitive land uses include, but are not limited to: residences, schools, libraries, hospitals, churches, hotels, motels, and outdoor recreational areas. These typify land uses where suitability is restricted by intrusive noises. Hence, they are termed "noise-sensitive." Noise-sensitivity factors include interference with speech communication, subjective judgement of noise acceptability and relative noisiness, need for freedom from noise intrusion, and sleep interference criteria.

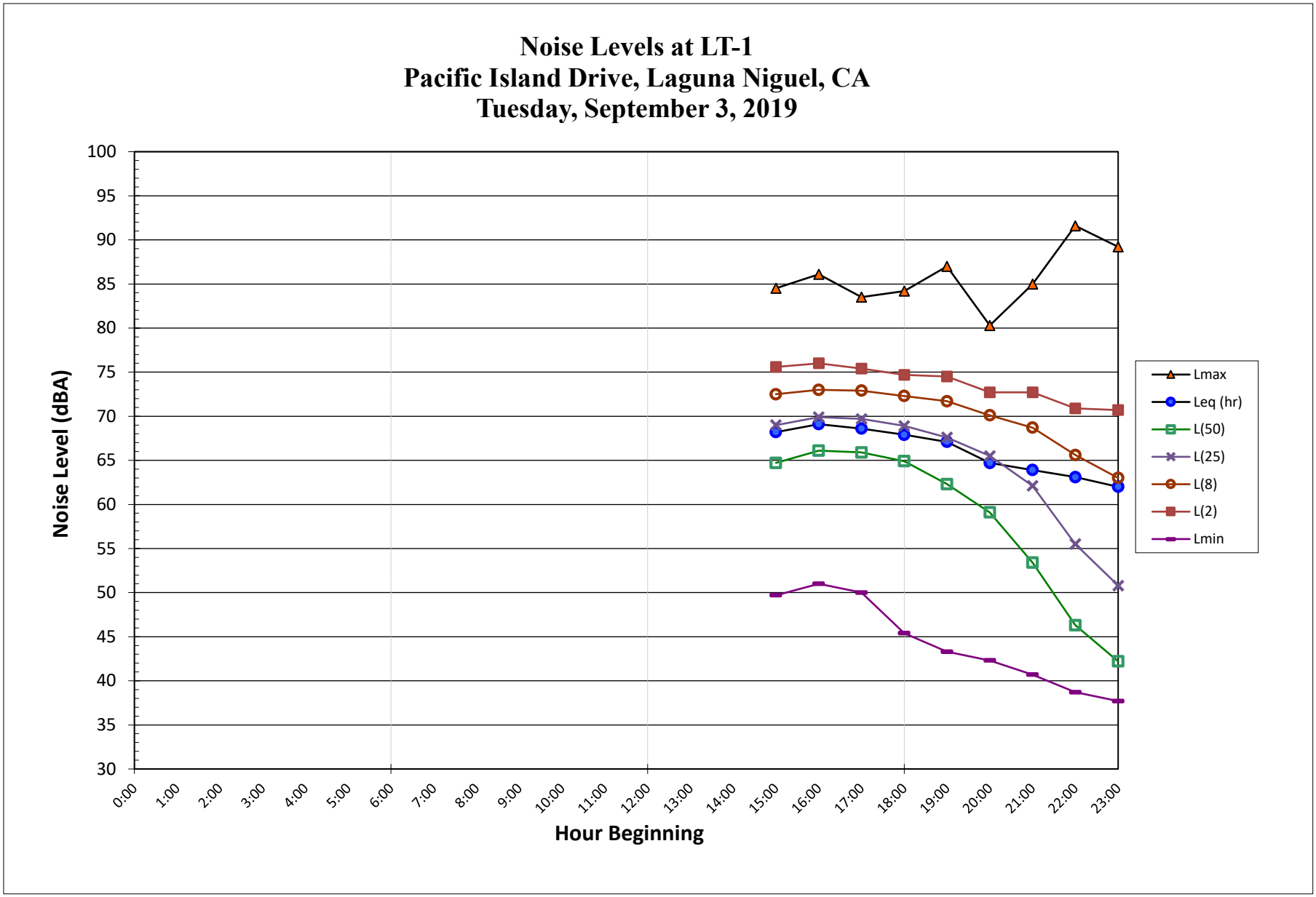
Sound: A reaction in the ear caused by radiant energy being transmitted from a source by longitudinal pressure wave in air or some other elastic medium.

APPENDIX A
GLOSSARY OF TERMS (CONT.)

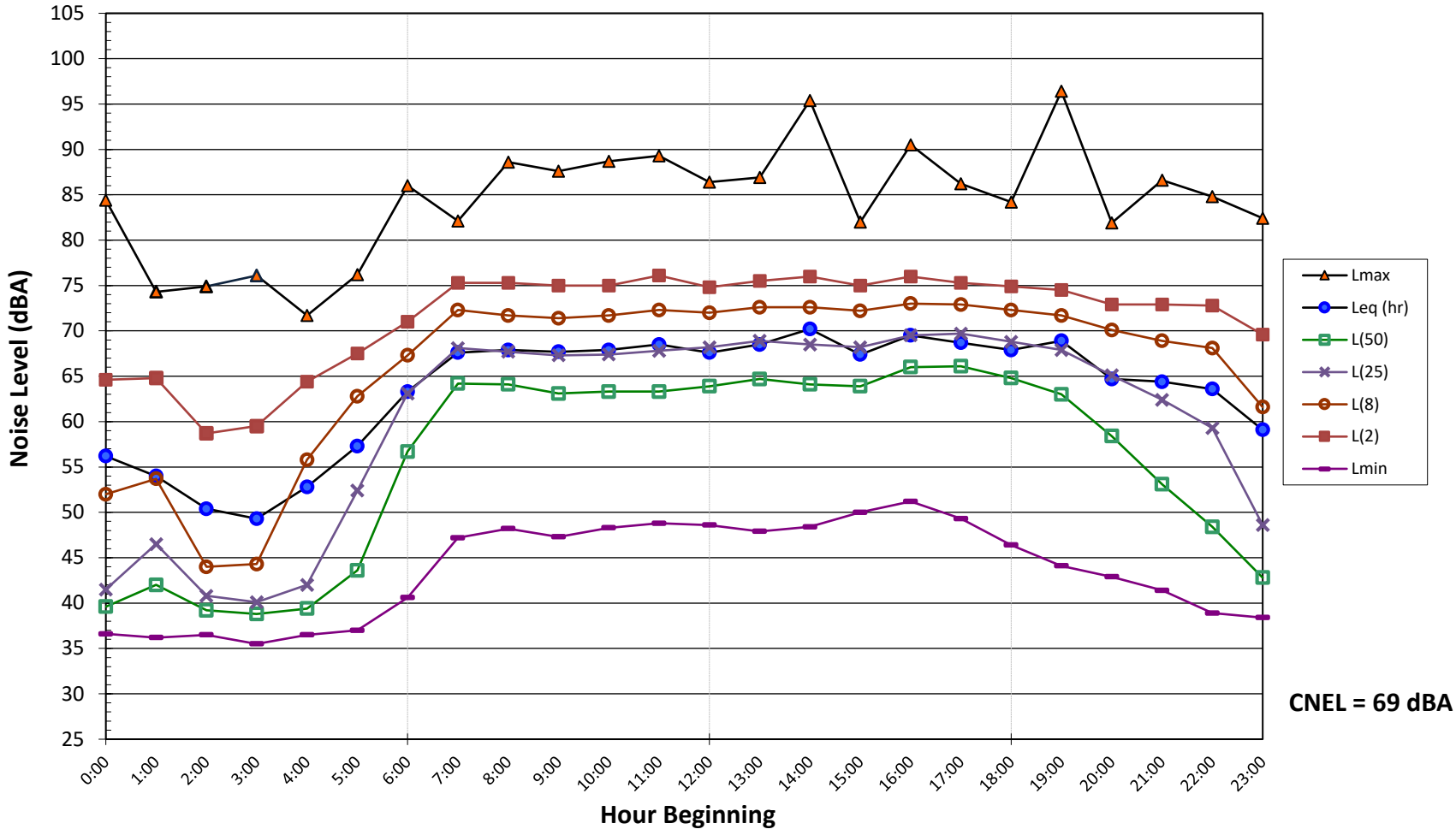
Sound Level (Noise Level): The weighted sound pressure level obtained by use of a sound level meter having a standard frequency-filter for attenuating part of the sound spectrum.

Sound Level Meter: An instrument, including a microphone, am amplifier, an output meter, and frequency weighting networks for the measurement and determination of noise and sound levels.

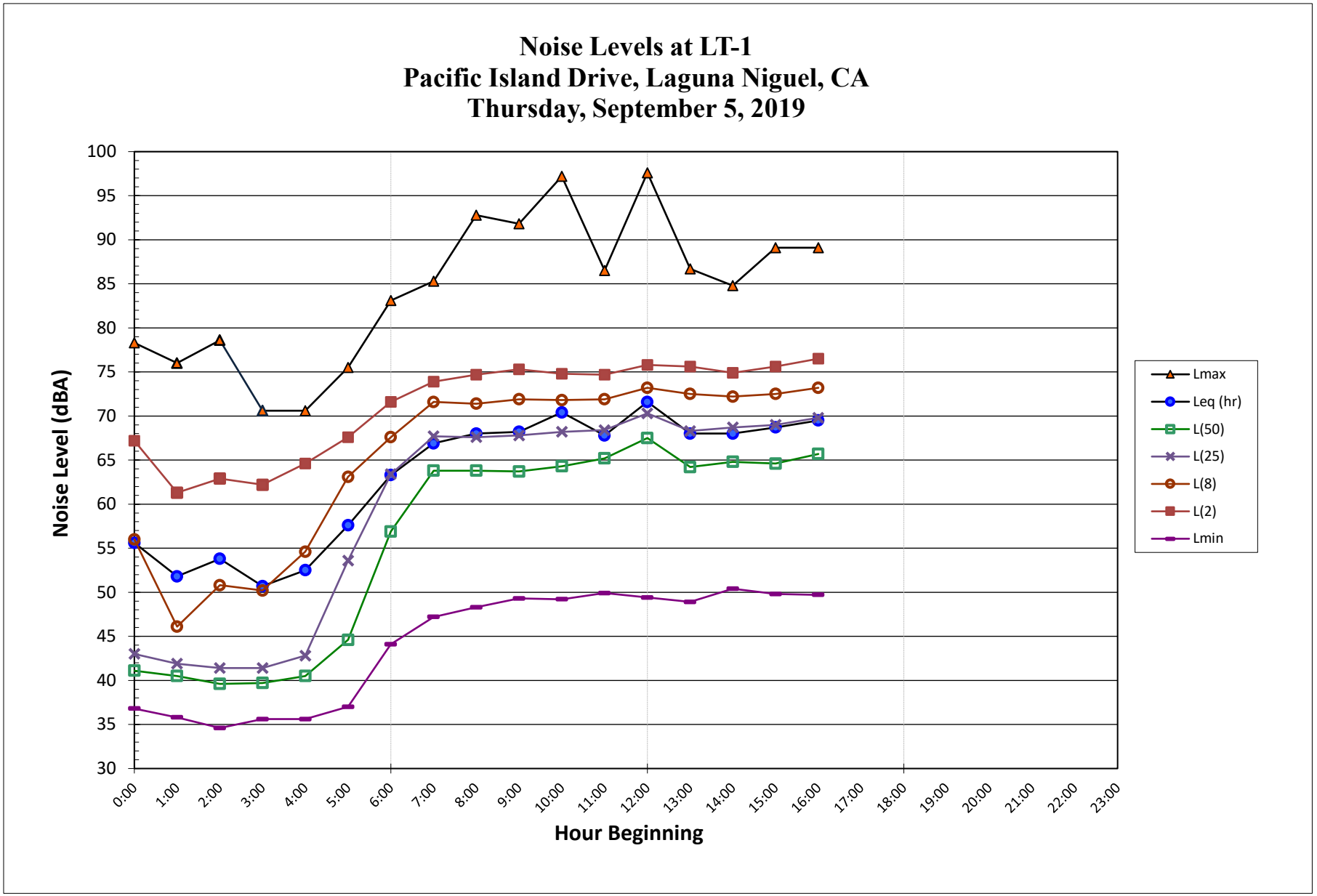
AMBIENT NOISE MONITORING RESULTS

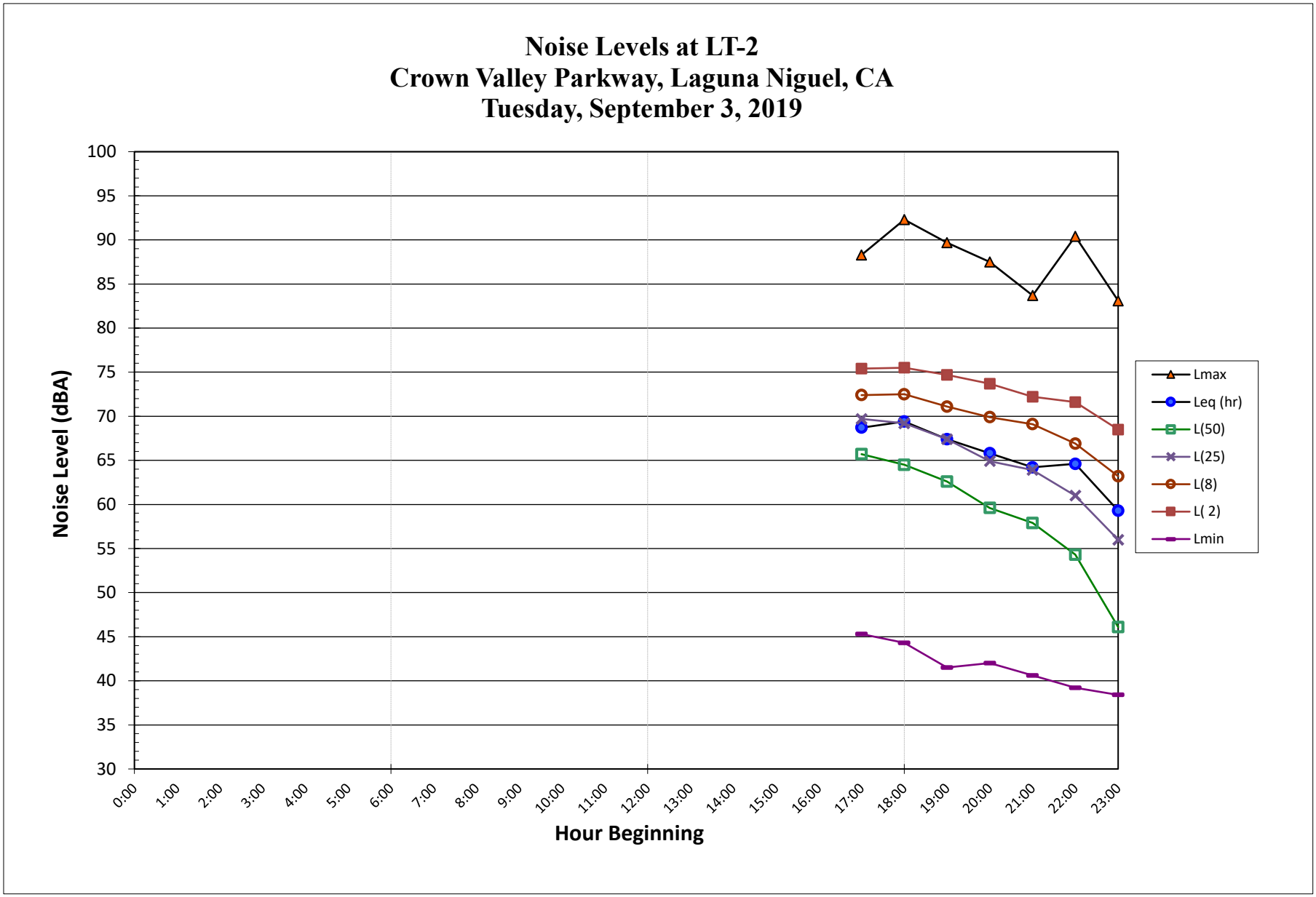

Noise Levels at LT-1
Pacific Island Drive, Laguna Niguel, CA
Tuesday, September 3, 2019
Noise Level (dBA)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
Leq (hr)
L(50)
L(25)
L(8)
L(2)
Lmin

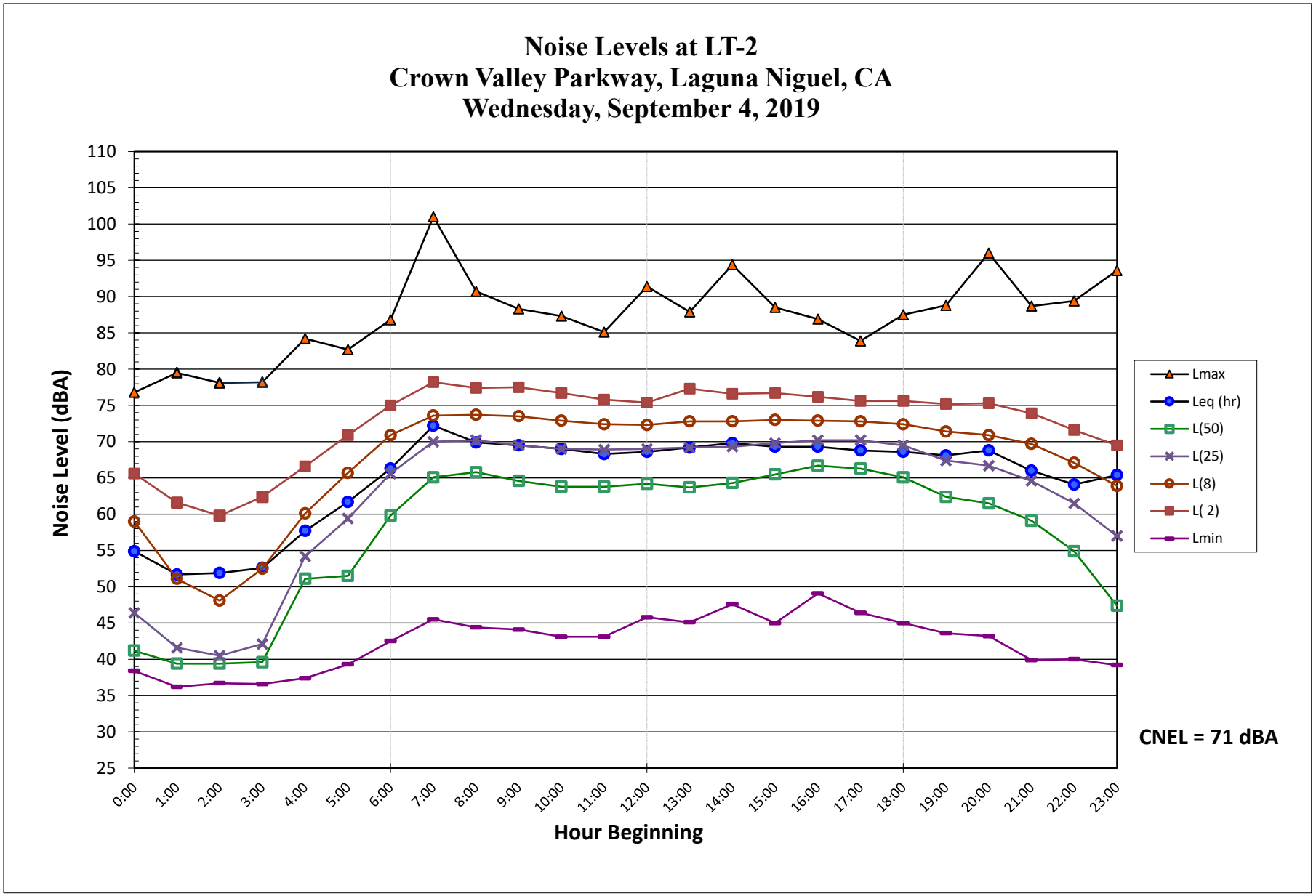
Noise Levels at LT-1
Pacific Island Drive, Laguna Niguel, CA
Wednesday, September 4, 2019



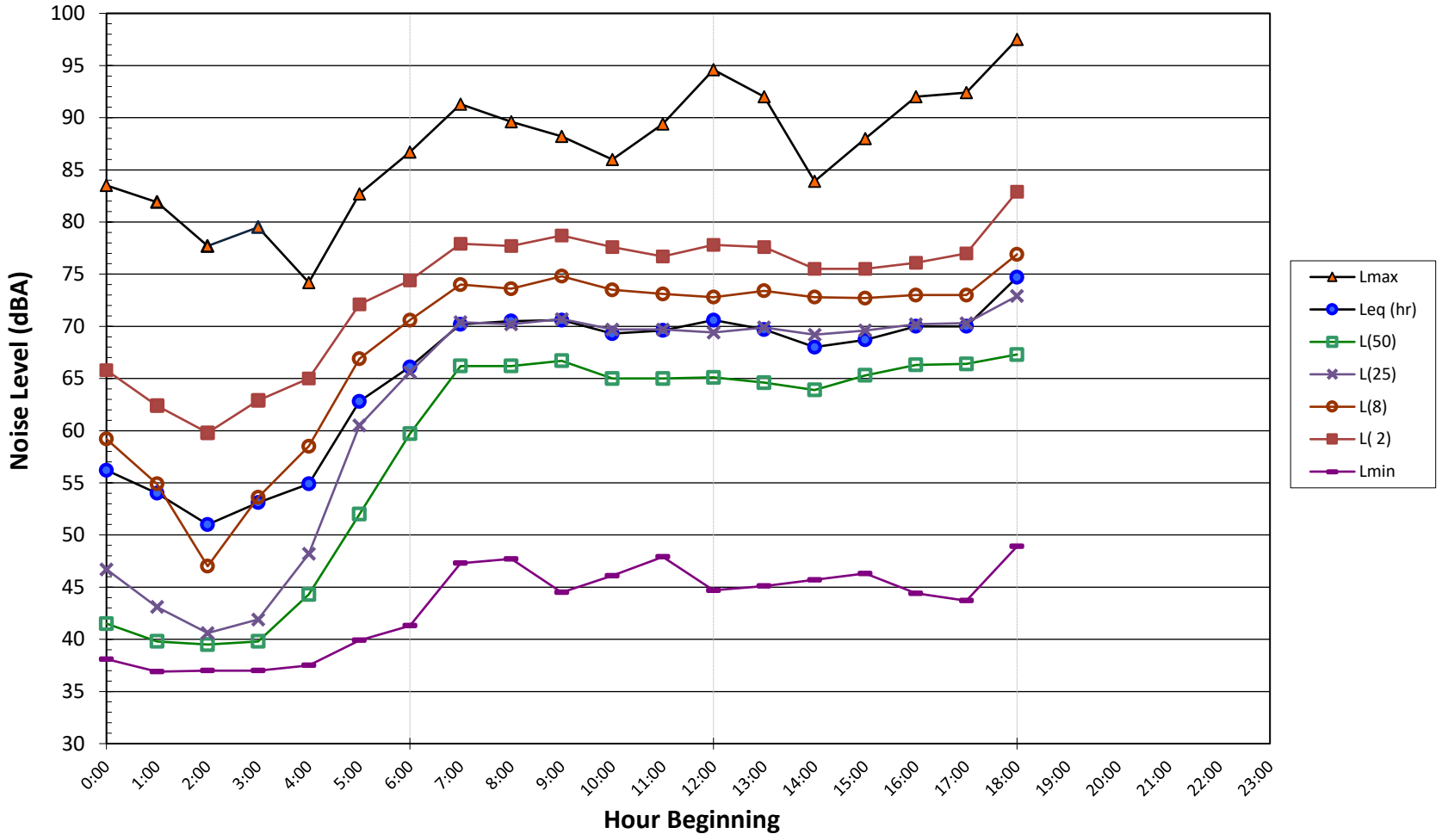
CNEL = 69 dBA


Noise Levels at LT-1
Pacific Island Drive, Laguna Niguel, CA
Thursday, September 5, 2019
Noise Level (dBA)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
Leq (hr)
L(50)
L(25)
L(8)
L(2)
Lmin


Noise Levels at LT-2
Crown Valley Parkway, Laguna Niguel, CA
Tuesday, September 3, 2019
Noise Level (dBA)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
Leq (hr)
L(50)
L(25)
L(8)
L(2)
Lmin


Noise Levels at LT-2
Crown Valley Parkway, Laguna Niguel, CA
Wednesday, September 4, 2019
Noise Level (dBA)
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
Leq (hr)
L(50)
L(25)
L(8)
L(2)
Lmin
CNEL = 71 dBA

Noise Levels at LT-2
Crown Valley Parkway, Laguna Niguel, CA
Thursday, September 5, 2019



STATIONARY DATA

Trash Compactor CNEL Calculation Estimations

	Measured Ambient Without Trash Compactor		2 Hour-Usage Facto With Trash Compactor		With Trash Compactor Continous 12-hours On	
Time	**Leq (hr)**	**Energy+Penalty**	**Leq (hr)**	**Energy+Penalty**	**Leq (hr)**	**Energy+Penalty**
0:00:00	47	501187.2336	47	501187.2336	47	501187.2336
1:00:00	47	501187.2336	47	501187.2336	47	501187.2336
2:00:00	47	501187.2336	47	501187.2336	47	501187.2336
3:00:00	47	501187.2336	47	501187.2336	47	501187.2336
4:00:00	47	501187.2336	47	501187.2336	47	501187.2336
5:00:00	47	501187.2336	47	501187.2336	47	501187.2336
6:00:00	47	501187.2336	47	501187.2336	47	501187.2336
7:00:00	47	50118.72336	47	50118.72336	47	50118.72336
8:00:00	47	50118.72336	47	50118.72336	47	50118.72336
9:00:00	47	50118.72336	47	50118.72336	47	50118.72336
10:00:00	47	50118.72336	47	50118.72336	**54**	251188.6432
11:00:00	47	50118.72336	47	50118.72336	**54**	251188.6432
12:00:00	47	50118.72336	47	50118.72336	**54**	251188.6432
13:00:00	47	50118.72336	47	50118.72336	**54**	251188.6432
14:00:00	47	50118.72336	**54**	251188.6432	**54**	251188.6432
15:00:00	47	50118.72336	**54**	251188.6432	**54**	251188.6432
16:00:00	47	50118.72336	47	50118.72336	**54**	251188.6432
17:00:00	47	50118.72336	47	50118.72336	**54**	251188.6432
18:00:00	47	50118.72336	47	50118.72336	**54**	251188.6432
19:00:00	47	158489.3192	47	158489.3192	**54**	794328.2347
20:00:00	47	158489.3192	47	158489.3192	**54**	794328.2347
21:00:00	47	158489.3192	47	158489.3192	**54**	794328.2347
22:00:00	47	501187.2336	47	501187.2336	47	501187.2336
23:00:00	47	501187.2336	47	501187.2336	47	501187.2336
Estimated CNEL, dBA		**54**		**54**		**56**

CONSTRUCTION DATA

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 09/17/2021
Case Description: LAG-08 Revised

**** Receptor #1 ****

Baselines (dBA)

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

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40	77.6	50.0	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
Backhoe	77.6	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
Total	77.6	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: 09/17/2021
Case Description: LAG-08 Revised

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) 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	50.0		0.0
Excavator	No	40	80.7	50.0		0.0
Dozer	No	40	81.7	50.0		0.0
Mounted Impact Hammer (hoe ram)	Yes	20	90.3	50.0		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
Concrete Saw	89.6	82.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	80.7	76.7	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	81.7	77.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mounted Impact Hammer (hoe ram)	90.3	83.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	90.3	87.0	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: 01/14/2022
Case Description: LAG-08 Revised

**** Receptor #1 ****

Description	Baselines (dBA) Land Use	Daytime	Evening	Night
Demolition, Site Prep, Rough Grading	Residential	60.0	55.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	50.0	0.0
Excavator	No	40		80.7	50.0	0.0
Dozer	No	40		81.7	50.0	0.0
Mounted Impact Hammer (hoe ram)	Yes	20		90.3	50.0	0.0
Tractor	No	40	84.0		50.0	0.0
Front End Loader	No	40		79.1	50.0	0.0
Grader	No	40	85.0		50.0	0.0
Scraper	No	40		83.6	50.0	0.0
Roller	No	20		80.0	50.0	0.0
Tractor	No	40	84.0		50.0	0.0

Results

Noise Limits (dBA)	Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA)											
	Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw	89.6	82.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	80.7	76.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	81.7	77.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mounted Impact Hammer (hoe ram)	90.3	83.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	84.0	80.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	79.1	75.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	85.0	81.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	83.6	79.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	80.0	73.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	84.0	80.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	90.3	89.9	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: 09/17/2021
Case Description: LAG-08 Revised

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site Prep and Rough Grading	Residential	60.0	55.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	50.0	0.0
Dozer	No	40		81.7	50.0	0.0
Tractor	No	40	84.0		50.0	0.0
Front End Loader	No	40		79.1	50.0	0.0
Grader	No	40	85.0		50.0	0.0
Scraper	No	40		83.6	50.0	0.0
Roller	No	20		80.0	50.0	0.0
Tractor	No	40	84.0		50.0	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
Excavator	80.7	76.7	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	81.7	77.7	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	84.0	80.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	79.1	75.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	85.0	81.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	83.6	79.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	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
Tractor	84.0	80.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	85.0	87.6	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: 09/17/2021
Case Description: LAG-08 Revised

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Site Prep and Rough Grading, Utility Trenching	Residential	60.0	55.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	50.0	0.0
Dozer	No	40		81.7	50.0	0.0
Tractor	No	40	84.0		50.0	0.0
Grader	No	40	85.0		50.0	0.0
Scraper	No	40		83.6	50.0	0.0
Scraper	No	40		83.6	50.0	0.0
Roller	No	20		80.0	50.0	0.0
Tractor	No	40	84.0		50.0	0.0

Results

Equipment	Calculated (dBA) Lmax	Calculated (dBA) Leq	Noise Limits (dBA) Day Lmax	Noise Limits (dBA) Day Leq	Noise Limits (dBA) Evening Lmax	Noise Limits (dBA) Evening Leq	Noise Limits (dBA) Night Lmax	Noise Limits (dBA) Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Noise Limit Exceedance (dBA) Day Leq	Noise Limit Exceedance (dBA) Evening Lmax	Noise Limit Exceedance (dBA) Evening Leq	Noise Limit Exceedance (dBA) Night Lmax	Noise Limit Exceedance (dBA) Night Leq
Excavator	80.7	76.7	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	81.7	77.7	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	84.0	80.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	85.0	81.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	83.6	79.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	83.6	79.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	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
Tractor	84.0	80.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	85.0	88.0	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: 09/17/2021
Case Description: LAG-08 Revised

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site Prep, Rough Grading, UT, FG	Residential	60.0	55.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	50.0	0.0
Dozer	No	40		81.7	50.0	0.0
Tractor	No	40	84.0		50.0	0.0
Front End Loader	No	40		79.1	50.0	0.0
Grader	No	40	85.0		50.0	0.0
Scraper	No	40		83.6	50.0	0.0
Roller	No	20		80.0	50.0	0.0
Tractor	No	40	84.0		50.0	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
Excavator	80.7	76.7	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	81.7	77.7	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	84.0	80.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	79.1	75.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	85.0	81.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	83.6	79.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	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
Tractor	84.0	80.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	85.0	87.6	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: 09/17/2021
Case Description: LAG-08 Revised

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Building Construction, Site Prep, Rough Grading, UT, FG	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	50.0		0.0
Dozer	No	40	81.7	50.0		0.0
Tractor	No	40	84.0	50.0		0.0
Front End Loader	No	40	79.1	50.0		0.0
Grader	No	40	85.0	50.0		0.0
Scraper	No	40	83.6	50.0		0.0
Roller	No	20	80.0	50.0		0.0
Tractor	No	40	84.0	50.0		0.0
Crane	No	16	80.6	50.0		0.0
Man Lift	No	20	74.7	50.0		0.0
Generator	No	50	80.6	50.0		0.0
Welder / Torch	No	40	74.0	50.0		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
Excavator	80.7	76.7	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	81.7	77.7	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	84.0	80.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	79.1	75.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	85.0	81.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	83.6	79.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	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

N/A														
Tractor	84.0	80.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	80.6	72.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	74.7	67.7	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	80.6	77.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	74.0	70.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	85.0	88.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 09/17/2021
Case Description: LAG-08 Revised

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Fine Grading	Residential	60.0	55.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85.0		50.0	0.0
Tractor	No	40	84.0		50.0	0.0
Front End Loader	No	40		79.1	50.0	0.0
Roller	No	20		80.0	50.0	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
Grader	85.0	81.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	84.0	80.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	79.1	75.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	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
Total	85.0	84.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 09/17/2021
Case Description: LAG-08 Revised

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Paving	Residential	60.0	55.0	50.0

Equipment

Description	Impact Device	Spec Usage (%)	Actual Lmax (dBA)	Receptor Lmax (dBA)	Estimated Distance (feet)	Shielding (dBA)
Paver	No	50	77.2	50.0	0.0	
Paver	No	50	77.2	50.0	0.0	
Roller	No	20	80.0	50.0	0.0	
Roller	No	20	80.0	50.0	0.0	
Pavement Scarafier	No	20	89.5	50.0	0.0	
Pavement Scarafier	No	20	89.5	50.0	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
Paver	77.2	74.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	77.2	74.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	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
Roller	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
Pavement Scarafier	89.5	82.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pavement Scarafier	89.5	82.5	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	89.5	86.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 09/17/2021
Case Description: LAG-08 Revised

**** 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	50.0	0.0
Man Lift	No	20		74.7	50.0	0.0
Generator	No	50		80.6	50.0	0.0
Tractor	No	40	84.0		50.0	0.0
Front End Loader	No	40		79.1	50.0	0.0
Welder / Torch	No	40		74.0	50.0	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	80.6	72.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	74.7	67.7	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	80.6	77.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	84.0	80.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	79.1	75.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	74.0	70.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	84.0	83.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 09/17/2021
Case Description: LAG-08 Revised

**** 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	50.0	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
Compressor (air)	77.7	73.7	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	77.7	73.7	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: 09/17/2021
Case Description: LAG-08 Revised

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Finish/Landscaping	Residential	60.0	55.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tractor	No	40	84.0	50.0	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
Tractor	84.0	80.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	84.0	80.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

LAG Revised, Construction Noise Modeling Attenuation Calculations

Levels in dBA Leq

Phase	RCNM Reference Noise Level	Residential Uses to West/Southwest	Residential Uses to Southeast	Residential/Kindercare to North	Laguna Niguel Presbyterian Church to North
Distance in feet	*50*	*550*	*800*	*750*	*900*
Site Abatement	74	53	50	50	48
Overlapping Site Prep, Rough Grading	88	67	64	64	62
Overlapping Demolition, Site Preparation, and Rough Grading	91	75	72	72	70
Overlapping Site Prep, Rough Grading, Utility Trenching	88	67	64	64	63
Building Construction (SP, RG, UT, FG, Paving Overlap)	88	67	64	65	63
Overlapping Site Preparation, Rough Grading, Utilities Trenching, Fine Grading	88	67	64	64	62
Fine Grading	85	64	60	61	59
Distance in feet	*50*	*180*	*260*	*230*	*540*
Paving	87	75	72	73	66
Distance in feet	*50*	*180*	*340*	*350*	*475*
Building Construction	84	72	67	67	64
Distance in feet	*50*	*125*	*200*	*200*	*300*
Architectural Coating	74	66	62	62	58
Finishing/Landscaping	80	72	68	68	64

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

Levels in dBA Leq

Demolition	RCNM Reference Noise Level	Residential Uses to South/Southwest	Residential Uses to Southeast
Distance in feet	*50*	*245*	*270*
Library	87	73	72
	RCNM Reference Noise Level	**Residential/Kindercare to North**	**Laguna Niguel Presbyterian Church to North**
Distance in feet	*50*	*230*	*440*
Justie Support Buildings	87	74	68
	RCNM Reference Noise Level	**Residential Uses to South/Southwest**	**Residential/Kindercare to North**
Distance in feet	*50*	*220*	*635*
Modular Buildings	87	74	65

LAG-08 Vibration Annoyance Attenuation Calculations

Levels in VdB

Overlapping Phases [1] *Distance in feet*	**Vibration @ 25 ft**	**Residential Uses to West/Southwest** *550*	**Residential Uses to Southeast** *800*	**Residential/Kindercare to North** *750*	**Laguna Niguel Presbyterian Church to North** *900*
Clam shovel	94	54	49	50	47
Vibratory Roller	94	54	49	50	47
Hoe Ram	87	47	42	43	40
Large Bulldozer	87	47	42	43	40
Caisson Drilling	87	47	42	43	40
Loaded Trucks	86	46	41	42	39
Jackhammer	79	39	34	35	32
Small Bulldozer	58	18	13	14	11

54

1 Site Abatement, Overlapping Site Prep, Rough Grading; Overlapping Demolition, Site Preparation, and Rough Grading; Overlapping Site Prep, Rough Grading, Utility Trenching; Building Construction (SP, RG, UT, FG, Paving Overlap)

Levels in VdB

Building Construction *Distance in feet*	**Vibration @ 25 ft**	**Residential Uses to West/Southwest** *180*	**Residential Uses to Southeast** *340*	**Residential/Kindercare to North** *350*	**Laguna Niguel Presbyterian Church to North** *475*
Clam shovel	94	68	60	60	56
Vibratory Roller	94	68	60	60	56
Hoe Ram	87	61	53	53	49
Large Bulldozer	87	61	53	53	49
Caisson Drilling	87	61	53	53	49
Loaded Trucks	86	60	52	52	48
Jackhammer	79	53	45	45	41
Small Bulldozer	58	32	24	24	20

LAG-08 Vibration Annoyance Attenuation Calculations

Levels in VdB

Paving *Distance in feet*	Vibration @ 25 ft	Residential Uses to West/Southwest *180*	Residential Uses to Southeast *260*	Residential/Kindercare to North *230*	Laguna Niguel Presbyterian Church to North *540*
Clam shovel	94	68	63	65	54
Vibratory Roller	94	68	63	65	54
Hoe Ram	87	61	56	58	47
Large Bulldozer	87	61	56	58	47
Caisson Drilling	87	61	56	58	47
Loaded Trucks	86	60	55	57	46
Jackhammer	79	53	48	50	39
Small Bulldozer	58	32	27	29	18

Levels in VdB

		Library Demolition		**Justice Support Buildings Demolition**		**Modular Buildings Demolition**	
Equipment *Distance in feet*	**Vibration @ 25 ft**	**Residential Uses to West/Southwest** *245*	**Residential Uses to Southeast** *270*	**Residential/Kindercare to North** *230*	**Laguna Niguel Presbyterian Church to North** *440*	**Residential Uses to West/Southwest** *220*	**Residential/Kindercare to North** *635*
Clam shovel	94	64	63	65	57	66	52
Vibratory Roller	94	64	63	65	57	66	52
Hoe Ram	87	57	56	58	50	59	45
Large Bulldozer	87	57	56	58	50	59	45
Caisson Drilling	87	57	56	58	50	59	45
Loaded Trucks	86	56	55	57	49	58	44
Jackhammer	79	49	48	50	42	51	37
Small Bulldozer	58	28	27	29	21	30	16

TRAFFIC DATA

Traffic Noise Calculator: FHWA 77-108 **Existing**

	Output						Inputs													
	dBA at 50 feet			Distance to CNEL Contour																
ID	$L_{eq\text{-}24hr}$	L_{dn}	CNEL	70 dBA	65 dBA	60 dBA	Roadway	Segment	ADT	Posted Speed Limit	Grade	% Autos	% Med Trucks	% Heavy Trucks	% Daytime	% Evening	% Night	Number of Lanes	Site Condition	Distance to Reciever
1	72.5	76.2	76.6	230	726	2296	Alicia Parkway	Aliso Creek to Highland Avenue	43,566	50	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
2	71.2	74.9	75.3	170	538	1702	Alicia Parkway	Higlands Avenue to Niguel Road	32,294	50	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
3	69.6	73.2	73.6	115	365	1154	Alicia Parkway	Niguel Road to Pacific Island Drive/Ivy Glenn Drive	21,891	50	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
4	71.7	75.4	75.8	188	596	1885	Crown Valley Parkway	Greenfield Drive to Moulton Parkway/Golden Lantern Street	35,764	50	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
5	69.7	73.4	73.8	119	377	1193	Crown Valley Parkway	Moulton Parkway/Golden Lantern Street to La Paz Road	29,492	45	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
6	69.9	73.6	74.0	125	395	1250	Crown Valley Parkway	La Paz Road to Niguel Road	30,894	45	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
7	69.4	73.1	73.5	111	351	1110	Crown Valley Parkway	Hillhurst Drive to Via Valle	27,425	45	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
8	70.0	73.7	74.1	128	404	1277	Crown Valley Parkway	Club House Drive to Pacific Island Drive/Camino Del Avion	24,231	50	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
9	67.9	71.6	72.0	78	248	784	Niguel Road	Crown Valley Parkway to LaHermosa Avenue	20,090	45	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	4	Hard	50
10	71.8	75.5	75.9	195	616	1947	Pacific Coast Highway	Valley Parkway to Niguel Road	28,172	50	0.0%	94.0%	2.0%	4.0%	75.5%	10.0%	15.0%	4	Hard	50

Traffic Noise Calculator: FHWA 77-108 **Existing With Project**

	Output						Inputs												
	dBA at 50 feet			Distance to CNEL Contour															
ID	$L_{eq\text{-}24hr}$	L_{dn}	CNEL	70 dBA	65 dBA	60 dBA	Roadway	Segment	ADT	Posted Speed Limit	Grade	% Autos	% Med Trucks	% Heavy Trucks	% Daytime	% Evening	% Night	Number of Lanes	Site Condition	Distance to Reciever
1	72.8	76.5	76.9	245	773	2445	Alicia Parkway	Aliso Creek to Highland Avenue	46,404	50	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
2	71.7	75.4	75.7	187	592	1871	Alicia Parkway	Higlands Avenue to Niguel Road	35,511	50	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
3	70.1	73.8	74.2	132	418	1323	Alicia Parkway	Niguel Road to Pacific Island Drive/Ivy Glenn Drive	25,108	50	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
4	72.0	75.6	76.0	200	634	2004	Crown Valley Parkway	Greenfield Drive to Moulton Parkway/Golden Lantern Street	38,035	50	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
5	70.1	73.8	74.2	131	414	1308	Crown Valley Parkway	Moulton Parkway/Golden Lantern Street to La Paz Road	32,330	45	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
6	70.3	74.0	74.4	137	434	1373	Crown Valley Parkway	La Paz Road to Niguel Road	33,922	45	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
7	69.7	73.4	73.8	119	375	1186	Crown Valley Parkway	Hillhurst Drive to Via Valle	29,317	45	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
8	70.3	74.0	74.4	137	432	1367	Crown Valley Parkway	Club House Drive to Pacific Island Drive/Camino Del Avion	25,934	50	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
9	68.1	71.8	72.1	82	258	817	Niguel Road	Crown Valley Parkway to LaHermosa Avenue	20,941	45	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	4	Hard	50
10	71.9	75.6	76.0	199	630	1993	Pacific Coast Highway	Valley Parkway to Niguel Road	28,834	50	0.0%	94.0%	2.0%	4.0%	75.5%	10.0%	15.0%	4	Hard	50

Traffic Noise Calculator: FHWA 77-108 **Year 2040 Buildout With Project**

	Output						Inputs												
	dBA at 50 feet			Distance to CNEL Contour															
ID	$L_{eq\text{-}24hr}$	L_{dn}	CNEL	70 dBA	65 dBA	60 dBA	Roadway	Segment	ADT	Posted Speed Limit	Grade	% Autos	% Med Trucks	% Heavy Trucks	% Daytime	% Evening	% Night	Number of Lanes	Site Condition	Distance to Reciever
1	73.0	76.7	77.0	253	801	2534	Alicia Parkway	Aliso Creek to Highland Avenue	48,086	50	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
2	71.7	75.4	75.7	188	594	1877	Alicia Parkway	Higlands Avenue to Niguel Road	35,628	50	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
3	70.0	73.7	74.1	127	402	1271	Alicia Parkway	Niguel Road to Pacific Island Drive/Ivy Glenn Drive	24,126	50	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
4	72.3	76.0	76.3	216	682	2157	Crown Valley Parkway	Greenfield Drive to Moulton Parkway/Golden Lantern Street	40,935	50	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
5	70.2	73.9	74.3	133	421	1331	Crown Valley Parkway	Moulton Parkway/Golden Lantern Street to La Paz Road	32,892	45	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
6	70.4	74.1	74.4	139	440	1393	Crown Valley Parkway	La Paz Road to Niguel Road	34,423	45	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
7	69.9	73.6	74.0	125	395	1251	Crown Valley Parkway	Hillhurst Drive to Via Valle	30,909	45	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
8	70.5	74.2	74.6	144	454	1437	Crown Valley Parkway	Club House Drive to Pacific Island Drive/Camino Del Avion	27,275	50	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
9	68.3	72.0	72.3	86	271	856	Niguel Road	Crown Valley Parkway to LaHermosa Avenue	21,954	45	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	4	Hard	50
10	72.8	76.5	76.9	246	778	2462	Pacific Coast Highway	Valley Parkway to Niguel Road	35,618	50	0.0%	94.0%	2.0%	4.0%	75.5%	10.0%	15.0%	4	Hard	50

Traffic Noise Calculator: FHWA 77-108 **Year 2040 Buildout No Project**

	Output						Inputs												
	dBA at 50 feet			Distance to CNEL Contour															
ID	$L_{eq\text{-}24hr}$	L_{dn}	CNEL	70 dBA	65 dBA	60 dBA	Roadway	Segment	ADT	Posted Speed Limit	Grade	% Autos	% Med Trucks	% Heavy Trucks	% Daytime	% Evening	% Night	Number of Lanes	Site Condition	Distance to Reciever
1	73.2	76.9	77.3	268	849	2683	Alicia Parkway	Aliso Creek to Highland Avenue	50,924	50	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
2	72.0	75.7	76.1	205	647	2047	Alicia Parkway	Highlands Avenue to Niguel Road	38,845	50	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
3	70.5	74.2	74.6	144	456	1441	Alicia Parkway	Niguel Road to Pacific Island Drive/Ivy Glenn Drive	27,343	50	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
4	72.5	76.2	76.6	228	720	2277	Crown Valley Parkway	Greenfield Drive to Moulton Parkway/Golden Lantern Street	43,206	50	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
5	70.5	74.2	74.6	145	457	1446	Crown Valley Parkway	Moulton Parkway/Golden Lantern Street to La Paz Road	35,730	45	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
6	70.7	74.4	74.8	152	479	1515	Crown Valley Parkway	La Paz Road to Niguel Road	37,451	45	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
7	70.2	73.9	74.2	133	420	1327	Crown Valley Parkway	Hillhurst Drive to Via Valle	32,801	45	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
8	70.8	74.5	74.8	153	483	1527	Crown Valley Parkway	Club House Drive to Pacific Island Drive/Camino Del Avion	28,978	50	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	6	Hard	50
9	68.4	72.1	72.5	89	281	890	Niguel Road	Crown Valley Parkway to La Hermosa Avenue	22,805	45	0.0%	96.8%	2.4%	0.8%	75.5%	10.0%	15.0%	4	Hard	50
10	72.9	76.6	77.0	251	793	2507	Pacific Coast Highway	Valley Parkway to Niguel Road	36,280	50	0.0%	94.0%	2.0%	4.0%	75.5%	10.0%	15.0%	4	Hard	50

RTE	DIST	CNTY	POST MILE	LEG	DESCRIPTION	VEHICLE AADT TOTAL	TRUCK AADT TOTAL	TRUCK % TOT VEH	TRUCK By AADT Axle 2	By AADT Axle 3	By AADT Axle 4	By AADT Axle 5+	TOTAL % 2	TRUCK By AADT Axle 3	By AADT Axle 4	By AADT Axle 5+	EAL 2-WAY (1000)	YEAR VER/ EST
1	12	ORA	R0.129	A	DANA POINT, JCT. RTE. 5	37750	2348	6.22	797	1111	314	126	33.93	47	13	5	220	03E
1	12	ORA	R0.78	A	DANA POINT, DOHENY PARK RD	38800	1889	4.87	641	894	253	101	33.93	47	13	5	177	03E
1	12	ORA	9.418	A	LAGUNA BEACH, JCT. RTE. 133 NORTH	38500	671	1.74	262	308	62	39	39.08	46	9	6	60	03E
1	12	ORA	19.797	B	NEWPORT BEACH, JCT. RTE. 55, NEWPORT BLVD	49400	563	1.14	433	78	26	26	76.92	14	5	5	35	00E
1	12	ORA	19.797	A	NEWPORT BEACH, JCT. RTE. 55, NEWPORT BLVD	49400	395	0.80	272	62	12	49	68.75	16	3	13	34	00E
1	12	ORA	21.549	B	SANTA ANA RIVER BRIDGE	38600	270	0.70	186	42	8	34	68.75	16	3	13	23	00E
1	12	ORA	23.739	B	HUNTINGTON BEACH, JCT. RTE. 39 NORTH, BEACH BLVD	38050	305	0.80	209	48	10	38	68.75	16	3	13	26	00E
1	07	LA	0	A	LOS ANGELES/ORANGE COUNTY LINE	42500	570	1.34	492	38	11	29	86.27	7	2	5	32	07V
1	07	LA	1.973	B	LONG BEACH, JCT. RTE. 22, SEVENTH ST	26000	697	2.68	493	111	29	64	70.75	16	4	9	54	05V
1	07	LA	1.973	A	LONG BEACH, JCT. RTE. 22, SEVENTH ST	34000	1064	3.13	635	123	41	265	59.69	12	4	25	131	05V
1	07	LA	3.557	B	LONG BEACH, LAKEWOOD BLVD	33000	347	2.10	207	40	13	87	59.69	12	4	25	43	07E
1	07	LA	3.557	A	LONG BEACH, LAKEWOOD BLVD	42000	359	1.71	318	25	4	12	88.47	7	1	3	18	07V
1	07	LA	7.288	B	LONG BEACH, JCT. RTE. 710	40500	2437	6.02	1458	457	55	467	59.81	19	2	19	262	05V
1	07	LA	7.288	A	LONG BEACH, JCT. RTE. 710	39000	7418	19.02	1665	1426	159	4168	22.44	19	2	56	1651	04V
1	07	LA	8.266	B	LONG BEACH, JCT. RTE. 103	34000	7456	21.93	1271	1798	247	4140	17.05	24	3	56	1675	07V
1	07	LA	8.266	A	LONG BEACH, JCT. RTE. 103	32000	7894	24.67	1235	2626	272	3761	15.64	33	3	48	1622	05V
1	07	LA	11.61	B	LOS ANGELES, JCT. RTE. 110	41500	2038	4.91	1092	351	70	525	53.58	17	3	26	262	05V