

NOISE IMPACT ANALYSIS
TTM 36567 SOUTH SHORE II
CITY OF LAKE ELSINORE, CALIFORNIA

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NOISE SETTING

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise is generally considered to be unwanted sound. Sound is characterized by various parameters that describe the rate of oscillation of sound waves, the distance between successive troughs or crests, the speed of propagation, and the pressure level or energy content of a given sound. In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level.

The decibel (dB) scale is used to quantify sound pressure levels. Although decibels are most commonly associated with sound, "dB" is a generic descriptor that is equal to ten times the logarithmic ratio of any physical parameter versus some reference quantity. For sound, the reference level is the faintest sound detectable by a young person with good auditory acuity.

Since the human ear is not equally sensitive to all sound frequencies within the entire auditory spectrum, human response is factored into sound descriptions by weighting sounds within the range of maximum human sensitivity more heavily in a process called "A-weighting," written as dB(A). Any further reference in this discussion to decibels written as "dB" should be understood to be A-weighted.

Time variations in noise exposure are typically expressed in terms of a steady-state energy level equal to the energy content of the time varying period (called LEQ), or alternately, as a statistical description of the sound pressure level that is exceeded over some fraction of a given observation period. Finally, because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, state law requires that, for planning purposes, an artificial dB increment be added to quiet time noise levels in a 24-hour noise descriptor called the Ldn (day-night) or the Community Noise Equivalent Level (CNEL). The CNEL metric has gradually replaced the Ldn factor, but the two descriptors are essentially identical.

CNEL-based standards are generally applied to transportation-related sources because local jurisdictions are pre-empted from exercising direct noise control over vehicles on public streets, aircraft, trains, etc. The City of Lake Elsinore therefore regulates the traffic noise exposure of the receiving property through land use controls.

Noise/land use compatibility standards for various classes of land uses are generally expressed in the Noise Element of the General Plan to insure that noise exposure is considered in any development decisions. The City of Lake Elsinore has guidelines for noise exposure standards which are shown in Table 1. However, in order to reduce the potential ambiguity of conditional acceptability, Lake Elsinore developed a more clear-cut matrix of acceptable noise levels summarized in Table 2.

Table 1 City of Lake Elsinore Land Use Compatibility Matrix

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

Interpretation:

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

Table 2
Interior and Exterior Noise Standards
Ldn/CNEL

Category	Uses	Noise Level Ldn	
		Interior	Exterior
Residential	Single Family, Duplex, Multi Family	45	60
	Mobile Homes	-	60
Commercial, Institutional	Hotel, Motel, Transient Lodging	45	-
	Hospital, School Classrooms	45	-
	Church, Library	45	-

For new residential uses, Lake Elsinore recommends an exterior noise level of up to 60 dB Ldn/CNEL and an interior noise level of 45 dB Ldn/CNEL. The exterior level applies to outdoor recreational uses such as back yards, patios, spas, etc. However, noise levels of up to 70 dB Ldn/CNEL are permissible after a detailed analysis of noise reduction features is made.

Interior standards apply to habitable rooms. Typical noise attenuation with closed, double-paned windows in modern frame and stucco construction is about 20-30 dB. Noise attenuation with partially open windows is 10-15 dB Ldn/CNEL. Interior standards can therefore be readily met without any “extra” mitigation if exterior levels are 55-60 dB Ldn/CNEL with open windows. With closed dual-paned windows, exterior levels of 65-75 dB Ldn/CNEL can be accommodated while still meeting interior standards.

For “stationary” noise sources such as mechanical equipment (pool pumps, air conditioners, etc.) the City does have legal authority to establish noise performance standards designed to not adversely impact adjoining residential uses. These standards are articulated in the jurisdictional Municipal Code. These standards recognize the varying noise sensitivity of both transmitting and receiving land uses. The property line noise performance standards are normally structured according to land use and time-of-day.

CITY OF LAKE ELSINORE NOISE STANDARDS

The City Noise Ordinance of the Lake Elsinore Municipal Code, is designed to protect people from non-transportation (stationary) noise. The Noise Ordinance sets limits on the level and the duration of time a stationary noise source may impact an adjoining residential use.

Ordinance limits generally apply to “stationary” sources such as mechanical equipment, or vehicles operating on private property. The City’s noise ordinance limits are stated in terms of a 30-minute limit with allowable deviations from this 50th percentile standard. The louder the level becomes, the shorter the time becomes that it is allowed to occur. Table 3 lists the property line noise limits and the maximum cumulative period of time that the noise level may occur during a 1-hour period.

Table 3

Municipal Code Exterior Noise Limits

RECEIVING LAND USE	TIME	Noise level that may not be exceeded for more than a cumulative period of:				
		30 MIN/HR	15 MIN/HR	5 MIN/HR	1 MIN/HR	ANYTIME
Single-Family Residential	10:00 p.m. – 7:00 a.m.	40	45	50	55	60
	7:00 a.m. – 10:00 p.m.	50	55	60	65	70
Multiple Dwelling Residential	10:00 p.m. – 7:00 a.m.	45	50	65	70	65
	7:00 a.m. – 10:00 p.m.	50	55	60	65	70
Public Space Office	7:00 a.m. – 10:00 p.m.	60	65	70	75	80
General Commercial	10:00 p.m. – 7:00 a.m.	60	65	70	75	80
	7:00 a.m. – 10:00 p.m.	65	70	75	80	85
Light Industrial	Anytime	70	75	80	85	90
Heavy Industrial	Anytime	75	80	85	90	95

[Ord. 772 § 17.78.060, 1986. Code 1987 § 17.78.060].

NOISE IMPACTS

Two characteristic noise sources are typically identified with land use intensification such as that proposed for TTM 36567 residential project. Initially, construction activities, especially heavy equipment, will create short-term noise increases near the project site. These impacts may be important if there is phased development and one phase is under construction adjacent to an already completed and occupied phase.

Upon completion, project-related traffic will cause an incremental increase in area-wide noise levels throughout the Lake Elsinore area. Traffic noise impacts are typically analyzed both to insure that a project will not adversely impact the acoustic environment of the surrounding community, as well as to insure that the project site is not exposed to an unacceptable level of noise resulting from the ambient noise environment acting upon the project. Typically, project-related, off-site noise impacts are evaluated as part of area-wide (community plan or specific plan) development planning.

STANDARDS OF SIGNIFICANCE

CEQA Guidelines identify significant impacts as those that cause standards to be exceeded when the standards are currently met. Impacts are also considered significant if they “substantially” worsen an existing unacceptable noise environment.

“Substantially” is not defined in any guidelines. The accuracy of sound level meters and of sound propagation computer models is no better than ± 1 dB. This is also below the human loudness difference discrimination level under ideal laboratory conditions. Most people cannot distinguish a change in the noise environment that differs by less than 3 dB between the pre- and post-project exposure if the change occurs under ambient conditions. For the purposes of this analysis, an increase of +3 dB which creates or worsens an area of noise/land use incompatibility would be considered a significant degradation of noise quality.

Because of the logarithmic relationship between traffic volumes and noise levels, it requires a dramatic increase in traffic to create even a perceptible change in noise levels. A +1 dB increase requires a 25 percent greater traffic volume. A +3 dB noise increase occurs when volumes double. In those areas where traffic levels are already high enough to create a noise concern, few projects would individually cause traffic volumes to double. Off-site traffic noise impacts tend therefore to be more of a cumulative, rather than an individual impact.

Construction noise is typically governed by ordinance limits on allowable times of equipment operations. CEQA Appendix G guidelines state that if an impact is regulated by a rule or regulation specifically designed to control a given type of impact (such as construction noise),

then compliance with that rule may be used in support of a finding that the impact is less-than-significant. Construction noise impacts therefore will be less-than-significant if they comply with the applicable ordinance limits. The Lake Elsinore Municipal Code restricts and regulates hours of construction operation and levels of construction noise. In Chapter 17.78, Section 17.78.080 (F), construction noise is restricted from 7:00 p.m. to 7:00 a.m. weekdays and at any time on Sundays or holidays, when it creates a noise disturbance across a residential or commercial property line. Section 17.78.080 (F) (2) regulates construction activity noise levels as follows:

B. Noise Restrictions at Affected Structures. When technically and economically feasible, the contractor shall conduct construction activities in such a manner that the maximum noise levels at the affected buildings will not exceed those levels listed in the following schedule:

1. At Residential Structures.

a. Mobile Equipment. Maximum noise levels for non-scheduled, intermittent, and short-term operation (less than 10 days) of mobile equipment:

	Single-family Residential (dBA)	Multi-family Residential (dBA)	Semi-residential/ Commercial (dBA)
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	75	80	85
Daily, 8:00 p.m. to 7:00 a.m. and all day Sunday and legal holidays.	60	65	70

b. Stationary Equipment Maximum noise level for repetitively scheduled and relatively long-term operation (period of 10 days or more) of stationary equipment:

	Single-family Residential (dBA)	Multi-family Residential (dBA)	Semi-residential/ Commercial (dBA)
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	60	65	70
Daily, 8:00 p.m. to 7:00 a.m. and all day Sunday and legal holidays.	50	55	60

2. At Business Structures.

- a. Mobile equipment. Maximum noise levels for non-scheduled, intermittent, short-term operation of mobile equipment: Daily, including Sunday and legal holidays, all hours: maximum of 85 dBA.

BASELINE NOISE LEVELS

The project area is currently an undeveloped parcel and is surrounded by other undeveloped parcels. Site access is difficult. Traffic on I-15, one of the significant contributors to areawide noise levels, is more than one-half mile away and almost completely screened by intervening terrain. Noise measurements conducted for Spyglass Ranch environmental studies found baseline levels in the mid-30 dB range at the approximate set-back distance of South Shore II from I-15. Therefore, noise levels at the project site can be assumed to be quite low since there are no major roadways or other noise generators in proximity. Noise is not considered as any constraint for proposed residential development of the project site.

CONSTRUCTION NOISE IMPACTS

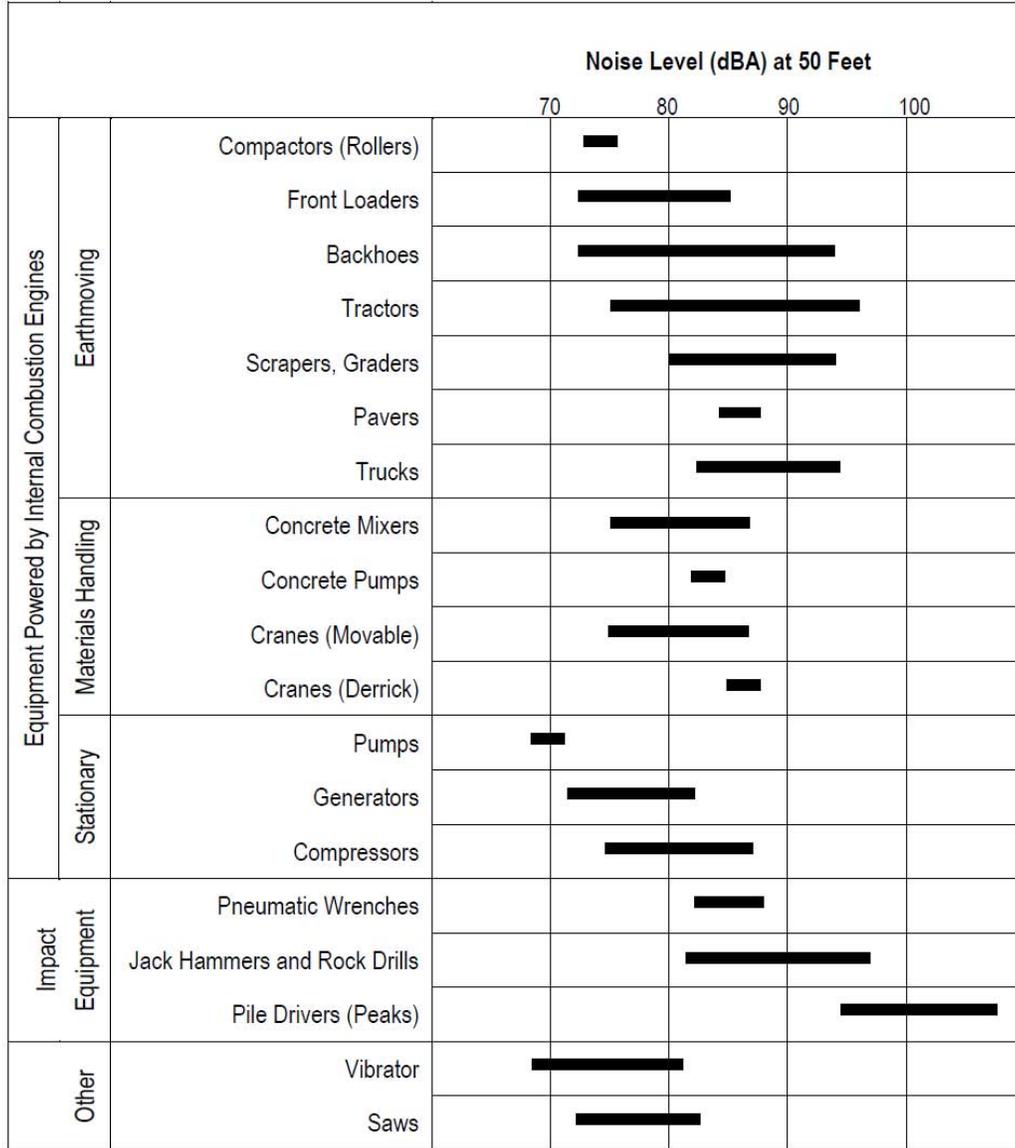
Temporary construction noise impacts will vary markedly because the noise strength of construction equipment ranges widely as a function of the equipment used and its activity level. Short-term construction noise impacts tend to occur in discrete phases dominated initially by demolition of existing structures and large earth-moving sources, then by foundation and parking lot construction, and finally for finish construction. The demolition and earth-moving sources are the noisiest with equipment noise typically ranging from 75 to 90 dB at 50 feet from the source.

Figure 1 shows the range of noise emissions for various pieces of construction equipment. Point sources of noise emissions are attenuated by a factor of 6 dB per doubling of distance through geometrical (spherical) spreading of sound waves. The quieter noise sources will drop to a 65 dB exterior/45 dB interior noise level by about 200 feet from the source while the loudest may require over 1,000 feet from the source to reduce the 90+ dB source strength to a generally acceptable 65 dB exterior exposure level. This estimate assumes a clear line-of-sight from the source to the receiver. Any change in terrain or completed development will act as a noise barrier that will interrupt equipment noise propagation. Construction noise impacts are, therefore, somewhat less than that predicted under idealized input conditions.

If site development were to be phased, any existing tenants of an already completed phase could be subject to construction noise from subsequent phases. Discretionary scheduling of noisiest activities may be required to minimize such possible construction noise intrusion. For example, it may be prudent to mass-grade and stabilize the entire project site before the first homes are occupied. Other options could include verifying that homes are unoccupied on a given day when heavy equipment encroachment is unavoidable. Noise can also be mitigated by locating all stationary noise generating construction equipment as far as practical from existing residences.

The City of Lake Elsinore regulates construction noise when it creates a noise disturbance across a residential or commercial property line. There are currently no nearby residential receivers in the project vicinity that would be affected by construction noise.

Figure 1
**Typical Construction Equipment
 Noise Generation Levels**



Source: EPA PB 206717, Environmental Protection Agency, December 31, 1971, "Noise from Construction Equipment and Operations."

PROJECT-RELATED VEHICULAR NOISE IMPACTS

Long-term noise concerns from the increase of residential uses at the project site center primarily on vehicular operations on project area roadways. These concerns were addressed using the California specific vehicle noise curves (CALVENO) in the federal roadway noise model (the FHWA Highway Traffic Noise Prediction Model, FHWA-RD-77-108). This model calculates the Leq noise level for a particular reference set of input conditions, and then makes a series of adjustments for site-specific traffic volumes, distances, speeds, or noise barriers.

Table 4 summarizes the 24-hour CNEL level at 50 feet from the roadway centerline along area roadway segments using data provided in the project traffic report. Several of the roadway segments examined in Table 4 are to be built in the future to support this and other area projects. These roadways do not currently exist so that no comparison to existing noise levels is possible. However traffic noise on these segments can be mitigated to below significance thresholds for any possible adjacent residential uses through either noise barriers or setback distance.

The project could create a potentially significant noise impact on Camino del Norte east of Main Street. There are currently only 200 vehicles per day utilizing this roadway segment as it dead ends shortly beyond the Main Street intersection. The with project traffic will increase noise levels by 8.1 dB CNEL though in the “existing with project” traffic noise levels are expected to be less than 58 dB CNEL at 50 feet from roadway centerline. This is less than the suggested compatibility threshold for sensitive use. Additionally, there are no existing sensitive uses along this roadway segment. Therefore, traffic noise levels are determined to create a less-than-significant impact.

The next largest traffic noise impact is on Main Street between Camino del Norte and the I-15. This increase is +0.9 dB CNEL at 50 feet from centerline. Not only is this impact less than the +3 dB CNEL significance threshold but the I-15 dominates the noise environment in this location and there are no sensitive uses along this approximate 200 feet of roadway.

Cumulatively, traffic noise will increase both from area growth and from the implementation of other area projects. In both the existing time frame and in the future, traffic noise will have increased substantially along many roadways. These traffic volume changes derive from infill development and from conversion of existing agricultural uses which will substantially increase and modify the area’s acoustic environment. Cumulative area growth may cause possible exceedances of the traffic noise threshold for noise sensitive land uses. As seen in Table 4, area wide growth could create traffic noise increases of up to 17 dB CNEL at 50 feet from the roadway centerline on Camino del Norte east of Main Street. There are no existing land uses sited along this roadway segment which could be impacted by this increase. The lack of adjacent sensitive uses renders cumulative traffic noise impacts to a less-than-significant level. Because of the limited size of the proposed project, the cumulative contribution to traffic noise is correspondingly small. The exterior noise exposure along project area roadways would substantially exceed the City of Lake Elsinore standard of 60 dB CNEL with or without the project’s. The project’s small cumulative traffic noise impact is not considered a substantial increase.

Table 5
TTM 36567 Project
Traffic Noise Impact Analysis
(dBA CNEL at 50 feet from centerline)

Segment	Existing	Existing+ Project	Existing+ Ambient+ Project
Camino del Norte/			
W of Main St	63.1	63.2	63.6
E of Main St	49.6	57.7	57.7
Main St/			
Camino del Norte-I-15	64.6	65.5	65.8
S of I-15	68.8	68.8	69.1
Elsinore Hills Drive/			
Camino del Norte-Street D	DNE	58.3	58.3
Street D-Street C	DNE	47.8	47.8

DNE=Does Not Exist

Segment	Opening Year	Opening Year+ Project
Camino del Norte/		
W of Main St	64.3	64.4
E of Main St	66.2	66.7
Main St/		
Camino del Norte-I-15	69.3	69.7
S of I-15	69.6	69.7
Elsinore Hills Drive/		
Camino del Norte-Street D	67.3	67.8
Street D-Street C	65.2	65.3

MITIGATION

The project would potentially cause one segment, Camino del Norte east of Main Street to exceed the +3 dB CNEL perception threshold. This segment has no adjacent existing sensitive uses. It also experiences an already elevated freeway background noise that was measured in the Spyglass Ranch environmental studies to be near 65 dB CNEL. The baseline will completely mask the project contribution. The calculated noise level increase in comparing “with project” to existing non-freeway traffic is 8.1 dB CNEL. With the masking effects of freeway noise, the true contribution is 0.6 dB CNEL which is imperceptible. No mitigation is indicated at this time.