NOISE IMPACT ANALYSIS

DIAMOND CENTER SPECIFIC PLAN

CITY OF LAKE ELSINORE, CALIFORNIA

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NOISE DESCRIPTORS

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise is generally defined as 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 wave. In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level.

The unit of sound pressure expressed as a ratio to the lowest sound level detectable by a young person with good auditory acuity is called a decibel (dB). Because sound or noise can vary in intensity by over one million times within the range of human hearing, decibels are a logarithmic progression used to keep sound intensity numbers at a convenient and manageable level. Since the human ear is not equally sensitive to all sound frequencies within the entire spectrum, noise levels at maximum human sensitivity are factored more heavily into sound descriptions in a process called "A-weighting" written as dBA. Any further reference to decibels written as "dB" should be understood to be A-weighted.

Time variations in noise exposure are normally 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 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 Community Noise Equivalent Level (CNEL).

CNEL also differs from Leq in that it applies a time-weighted factor designed to emphasize noise events that occur during the evening and nighttime hours (when quiet time and sleep disturbance is of particular concern). Noise occurring during the daytime period (7:00 AM to 7:00 PM) receives no penalty. Noise produced during the evening time period (7:00 PM to 10:00 PM) is penalized by 5 dBA, while nighttime noise (10:00 PM to 7:00 AM) is penalized by 10 dBA.

Most community development noise standards utilize the CNEL metric. Because the CNEL metric averages noise over a 24-hour period the noise impact from a single event noise source such as a baseball game or fireworks display are balanced by times of no such noise activity. Although noise during a single event noise episode such as during gametime or fireworks may be high, duration is typically during hours of lesser noise sensitivity and the averaged CNEL can still be low depending on the frequency, duration and time of day of such episodes.

CITY OF LAKE ELSINORE NOISE STANDARDS

The City of Lake Elsinore has adopted noise/land use compatibility guidelines for acceptable community noise levels that are based upon the CNEL rating scale. The guidelines rank noise/land use compatibility in terms of varying degrees of acceptability of noise levels for various land use types.

Table 1, from the City of Lake Elsinore General Plan/Noise Element, presents the City of Lake Elsinore Noise and Land Use Compatibility Matrix, adopted and slightly modified from the State of California guidelines. "Clearly Compatible" levels for proposed project residential uses are up to 60 dB CNEL, and "Normally Compatible" are up to 70 dB CNEL. A 65 dB CNEL exterior level is the noise threshold where noise begins to substantially interfere with enjoyment of any outdoor recreational amenity such as a yard, patio, spa/pool, etc. A level up to 65 dB CNEL exterior, and 45 dB CNEL interior would therefore be the applicable noise standard for the residential component of the proposed Diamond Center project in Lake Elsinore.

The City of Lake Elsinore considers office uses "Clearly Compatible" with noise environments of 65 dB CNEL or less and "Normally Compatible" with CNEL's of 75 dB or less. A level of 70 dB CNEL is considered compatible for commercial/ retail uses. Unless commercial projects include noise-sensitive uses such as outdoor dining, noise exposure is generally not considered a commercial facility siting constraint for typical project area noise. In most instances, commercial uses are conducted in enclosed space such that an acceptable interior noise environment is more critical than the exterior. An interior noise level of 55 dB CNEL is typically required for commercial use.

Noise Use Compatibility Standards apply to those noise sources not amenable to local control such as on road traffic, aircraft, trains, etc. For commercial uses, noise issues would center more on noise from on-site operations possibly impacting off-site sensitive receivers rather than from site suitability to the ambient noise environment. On-site noise generation is regulated by the City of Lake Elsinore Municipal Code.

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	*Single Family, Duplex, Multiple Family*	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	Amphitheater, Concert Hall	B	B	C	C	D	D	D
INSTITUTIONAL Civic Center	Auditorium, Meeting Hall							
COMMERCIAL *Recreation*	Children's Amusement Park, Miniature Golf Course, Go-cart Track, Equestrian Center, Sports Club	A	A	A	B	B	D	D
COMMERCIAL *General, Special* INDUSTRIAL, INSTITUTIONAL	Automobile Service Station, Auto Dealership, Manufacturing, Warehousing, Wholesale, Utilities	A	A	A	A	B	B	B
INSTITUTIONAL *General*	Hospital, Church, Library, Schools Classroom	A	A	B	C	C	D	D
OPEN SPACE	Parks	A	A	A	B	C	D	D
OPEN SPACE	Golf Course, Cemetaries, 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.

LAKE ELSINORE NOISE ORDINANCE

The City's noise standards for non-transportation sources are articulated in the Noise Ordinance. Noise from one land use crossing the property line of an adjacent property are regulated by Section 17.78.060of the Lake Elsinore Municipal Code. These noise standards are expressed in terms of a mean (50^{th} percentile) noise level, which is the noise level allowed for up to 30 minutes. Some short-term noise levels may exceed the 50^{th} percentile standard, up to a maximum of 20 dB above the allowable mean.

The Lake Elsinore Noise Ordinance allowable exterior noise levels for various land uses are shown in Table 2. A mean noise level of 50 dB (50^{th} percentile, or "L_{50}") by day and 45 dBA L_{50} at night is the standard applicable at the nearest multi-family existing homes. Commercial and office uses are permitted higher noise levels.

Because this project includes mixed use development and because residential uses abut the project site to the west, unacceptable noise levels at the residential uses emanating from the adjacent commercial uses could arise. The noise ordinance states that at a boundary between two different noise uses, the noise level applicable to the lower noise zone plus six dB shall apply. Therefore, for this project site where commercial uses abut multi-family residential uses the applicable noise standard (L_{50}) at the residential boundary is 51 dB nocturnal and 56 dB daytime.

When these noise levels are already exceeded by ambient noise levels, then the ambient level becomes the standard, adjusted upward in 5 dB increments. As seen in Table 3 later in this report, the L_{50} daytime measurement at the nearest residences west of the site is ranged from 46-54 dB and nighttime measurements ranged from 41-53 dB. The quietest day and night hours were below the boundary interface standards. No adjustment of the applicable noise standards is indicated.

Table 2

Lake Elsinore Exterior Noise Standards

Land Use (Receptor Property)	Time Intervals	(L_{50})
Single Family Residential	10:00 p.m. to 7:00 a.m. (nighttime) 7:00 a.m. to 10:00 p.m. (daytime)	40 50
Multi Family Residential	10:00 p.m. to 7:00 a.m. (nighttime) 7:00 a.m. to 10:00 p.m. (daytime)	45 50
Limited Commercial and Office	10:00 p.m. to 7:00 a.m. (nighttime) 7:00 a.m. to 10:00 p.m. (daytime)	55 60
General Commercial	10:00 p.m. to 7:00 a.m. (nighttime) 7:00 a.m. to 10:00 p.m. (daytime	60 65
Light Industrial	Any Time	70
Heavy Industrial	Any Time	75

L_{50}: Noise levels which may not be exceeded for a cumulative period of more than 30 minutes in any hour. If the ambient L_{50} exceeds the levels listed above, then the ambient L_{50} becomes the exterior noise level adjusted upward in five dB increments.

The Noise Standards shall not exceed:
+5 dB for a cumulative period of more than 15 minutes in any hour, or
+10 dB for more than 5 minutes in any hour, or
+15 dB for a cumulative period of more than 1 minute in any hour, or
+20 dB or the maximum measured ambient level for any period of time.

If the measured ambient level differs from that permissible within any of the noise limit categories above, the allowable noise exposure standard shall be adjusted upward in five dB increments for each category as appropriate to reflect said ambient noise level.

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

IF THE MEASUREMENT LOCATION IS ON A BOUNDARY BETWEEN TWO DIFFERENT ZONES, THE NOISE LEVEL LIMIT APPLICABLE TO THE LOWER NOISE ZONE PLUS SIX DB SHALL APPLY.

BASELINE NOISE LEVELS

Noise measurements were made in order to document existing baseline levels in the area. These help to serve as a basis for projecting future noise exposure, both from project upon the surrounding community and from ambient noise activity upon the proposed project. Noise measurements were conducted for 24-hours on two different weeks. The first 24-hour reading captured noise levels on a Friday with no baseball game and the second 24-hour reading captured noise levels during a Friday with a baseball game and fireworks. Noise readings locations are shown in Figure 1and measurement results are shown in Tables 3 and 4.

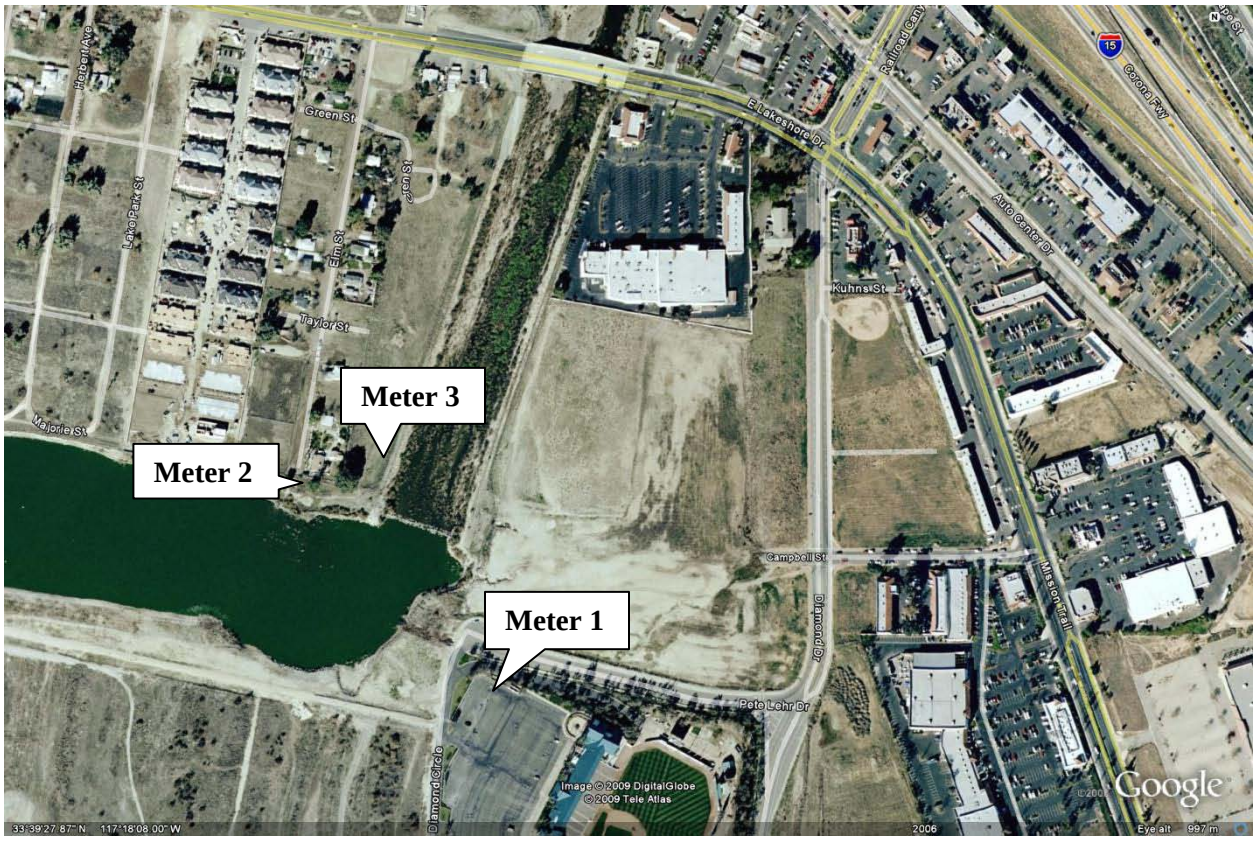
The "no game" noise measurements were obtained on Friday, May 15, 2009 and are shown in Table 3. The "game day" readings were obtained one week later on Friday, May 22, 2009 and are shown in Table 4. As seen in Tables 3 and 4, "game" Friday has higher Leq's starting at about 5 p.m. and extending through about 11 p.m. The hour with the largest change is 9-10 p.m. presumably when fireworks occured. The difference between game and no game Friday is about 4 dB CNEL in the stadium parking lot.

In the residential areas, background "no game" Friday noise measurements were 56-57 dB CNEL. On the Friday with a game, measured CNELs at the same locations were 60-63 dB. Again the most marked difference in noise levels occurred at 9 p.m. during fireworks. Because the fireworks occur during a time frame of greater noise sensitivity, a greater penalty is incurred for the CNEL calculation.

Regardless, even on a game and fireworks day, measured noise levels in the closest residential neighborhoods adjacent to the Diamond Stadium were within the City of Lake Elsinore recommended compatibility guidelines

Figure 1

Noise Meter Locations



Meter 1: Northwest Corner of Stadium Grounds Parking Lot
Meter 2: Closest Single Family Home, South End of Elm Street
Meter 3: Closest Residences, Apartment Complex (Lakeshore Address)

Table 3
Diamond Center
"No Game" Friday
Existing On-Site Hourly Leq's and CNEL

Time Interval	Site 1	Site 2	Site 3
0:00-1:00	44.5	53.3	44.8
1:00-2:00	52.0	40.5	43.6
2:00-3:00	44.7	42.6	43.0
3:00-4:00	47.6	40.5	57.2
4:00-5:00	49.5	43.9	48.0
5:00-6:00	54.4	48.1	49.4
6:00-7:00	53.7	49.5	49.4
7:00-8:00	57.0	48.2	49.0
8:00-9:00	51.0	45.6	44.1
9:00-10:00	49.9	46.3	44.3
10:00-11:00	47.5	48.5	44.2
11:00-12:00	51.7	47.0	45.2
12:00-13:00	50.4	49.5	45.5
13:00-14:00	51.3	46.3	44.4
14:00-15:00	55.0	48.0	44.9
15:00-16:00	54.2	50.1	47.3
16:00-17:00	55.3	52.6	47.4
17:00-18:00	55.4	52.0	46.9
18:00-19:00	54.6	53.2	48.7
19:00-20:00	54.0	53.1	49.0
20:00-21:00	52.1	52.6	53.6
21:00-22:00	48.6	51.2	49.4
22:00-23:00	48.1	48.1	47.7
23:00-24:00	51.2	48.5	50.0

Noise levels are "penalized" by +5 dB in the evening from 7 p.m. to 10 p.m., and by +10 dB at night from 10 p.m. to 7 a.m. in the CNEL calculations (a weighted average)**.**

Resultant CNEL

Measurement Parameter	Site 1	Site 2	Site 3
24-Hour CNEL	57.7	55.5	56.9

Table 4
Diamond Center
"Game" Friday
Existing On-Site Hourly Leq's and CNEL

Time Interval	Site 1	Site 2	Site 3
0:00-1:00	50.6	50.5	45.9
1:00-2:00	44.9	47.7	40.5
2:00-3:00	49.4	49.4	43.0
3:00-4:00	45.2	43.7	55.8
4:00-5:00	48.4	44.0	43.4
5:00-6:00	53.9	47.1	48.8
6:00-7:00	51.7	50.7	47.8
7:00-8:00	52.6	48.8	49.6
8:00-9:00	52.4	47.2	52.1
9:00-10:00	58.8	47.5	43.4
10:00-11:00	54.6	51.1	49.3
11:00-12:00	57.2	49.6	46.4
12:00-13:00	55.8	51.2	46.1
13:00-14:00	54.7	54.2	50.7
14:00-15:00	54.8	60.7	49.6
15:00-16:00	53.2	49.9	45.6
16:00-17:00	55.8	48.0	45.6
17:00-18:00	60.3	49.6	47.0
18:00-19:00	59.7	53.4	50.4
19:00-20:00	57.5	55.8	51.7
20:00-21:00	56.4	54.9	52.3
21:00-22:00	67.6	65.6	70.7
22:00-23:00	57.4	51.9	49.9
23:00-24:00	51.7	49.4	46.0

Noise levels are "penalized" by +5 dB in the evening from 7 p.m. to 10 p.m., and by +10 dB at night from 10 p.m. to 7 a.m. in the CNEL calculations (a weighted average)**.**

Resultant CNEL

Measurement Parameter	Site 1	Site 2	Site 3
24-Hour CNEL	62.4	59.9	62.9
Game Day versus No Game	+4.7	+4.4	+6.0

NOISE IMPACTS

Two characteristic noise sources are typically identified with land use intensification such as that proposed for the Diamond Center Specific Plan project. Initially, construction activities, especially heavy equipment, will create short-term noise increases near the project site. These impacts may be important because there is phased development and one phase will be 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 project area. Traffic noise impacts are generally analyzed both to insure that the project does 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 on the project. This project will cause an increase in area wide traffic but the increase must be evaluated relative to the overall cumulative traffic projections.

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.

CONSTRUCTION NOISE IMPACTS

Construction noise impacts vary markedly because the noise strength of construction equipment ranges widely as a function of the equipment used which changes during the course of the project. Construction noise tends to occur in discrete phases dominated initially by demolition and/or earth-moving sources and later for finish construction. As shown in Figure 2, heavy equipment noise can exceed 90 dB(A) and averages about 85 dB(A) at 50 feet from the source when the equipment is operating at typical loads. Most heavy equipment operates with varying load cycles over any extended period of time.

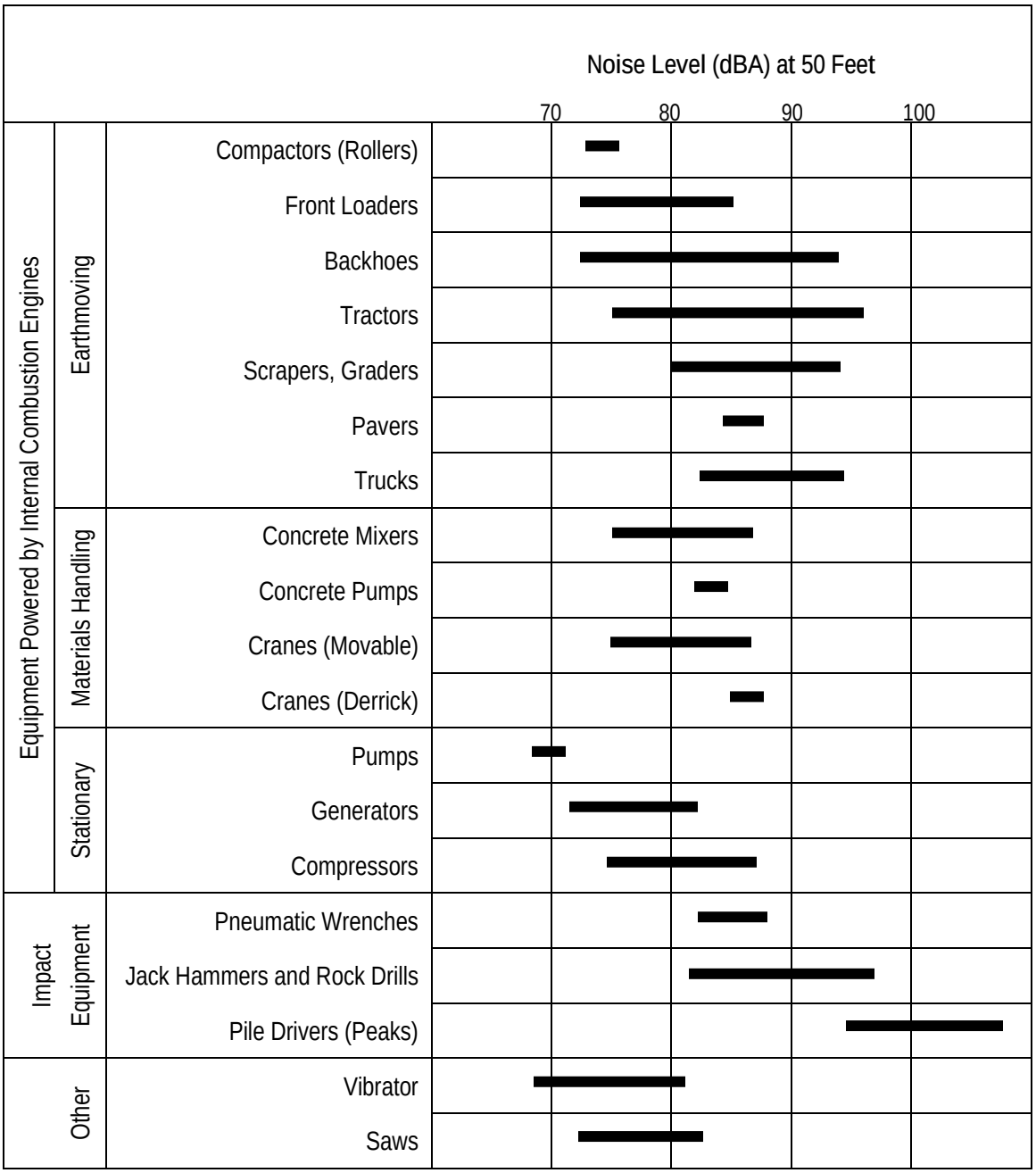
Construction noise exposure can be further worsened when several pieces of equipment operate in close proximity. Because of the logarithmic nature of decibel addition, two equally loud pieces of equipment will be +3 dB louder than either one individually. Three simultaneous sources are +5 dB louder than any single source. Thus, while average operational equipment noise levels are perhaps 5 dB less than at peak power, simultaneous equipment operation can still yield an apparent noise strength equal to any individual source at peak noise output. Whereas the average heavy equipment reference noise level is 85 dB(A), short-term levels from either peak power or from several pieces operating in close proximity can be as high as 90 dB(A).

Point sources of noise emissions are atmospherically attenuated by a factor of 6 dB per doubling of distance. The loudest construction activities would require less than 200 feet of distance between the source and a nearby receiver to reduce the peak 90 dB source strength to the generally acceptable 80 dB exterior exposure level for multi-family residences specified in Chapter 17.78, Section 17.78.080 (F) of the City Municipal Code. The closest existing residence is approximately 350 feet from the nearest Diamond Center perimeter and will therefore experience construction noise levels within the allowable envelope as long as activities occur in daytime hours of lesser noise sensitivity (7 a.m. to 8 p.m.).

Since site development is phased, any existing residents or tenants of an already completed phase will be subject to construction noise from subsequent phases. Discretionary scheduling of noisiest activities may be required to minimize such possible construction noise intrusion. Noise can also be mitigated by locating all stationary noise generating construction equipment as far as practical from existing residences. If impulsive noise generation such as pile driving or jack-hammers is necessary close to noise-sensitive users, activity scheduling to minimize off-site impacts, or erection of temporary barriers, may be necessary.

Figure 2

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 5 summarizes the 24-hour CNEL level at 50 feet from the roadway centerline along 31 roadway segments. The noise analysis utilizes data from the project traffic analysis, prepared by Urban Crossroads for this project. Five time frames were evaluated; existing, 2012, 2014, 2016 and build-out.

Several of the roadway segments examined in this study are to be built in the future to support this project such as Loop Road and Diamond Drive and the site entrances off these roadways. Some of these roadways do not currently exist so that future comparison to existing noise levels is not possible. However traffic noise on these segments must be mitigated to below significance thresholds for any adjacent residential user.

Phase 1 Time Frame

Phase 1 is to be completed by 2012. Implementation of Phase 1 will not cause any roadway segments to exceed significance thresholds. Project only impacts are the difference between the 2012 “no project” scenario and the 2012 “with project” scenario. The maximum project-only traffic noise increment will be +2.2 dB CNEL.

Future Phases and Build-Out

Phase 2 is to be completed in 2014 and Phase 3 in 2016. Project only impacts were examined for each phase/time frame. For the opening year of Phases 2 and 3, the roadway segments shown as bolded in Table 6 are expected to exceed significance thresholds. Table 7 identifies potentially impacted segments.

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

Segment		Existing	2012	2012 w/Project	2012 w/Project and Cumult.
Railroad Canyon Rd/	N of Summerhill	72.4	72.7	72.8	73.7
Auto Center Dr/	N of Diamond	66.4	66.6	66.9	67.4
Casino Dr/	S of Diamond	66.2	66.4	66.5	66.8
	N of Malaga	66.2	66.4	66.5	66.8
Diamond Dr/	Summerhill - I-15 NB Ramps	74.2	74.5	74.6	75.2
	I-15 NB Ramps - I-15 SB Ramps	73.1	73.4	73.5	74.3
	I-15 SB Ramps-Auto Center	71.5	71.8	72.1	73.0
	Auto Center-Lakeshore	70.0	70.3	70.8	72.1
	Lakeshore-Dwy 5	62.0	62.3	64.6	67.5
	Dwy 5 -Campbell	62.0	62.3	63.8	67.1
	Campbell-Dwy 6	58.6	59.0	60.1	65.8
	Dwy 6 - Dwy 7	57.4	58.3	59.3	65.6
	Dwy 7 - Sylvester	57.4	58.3	59.3	65.6
	S of Sylvester	58.6	59.0	59.6	66.3
Mission Trail/	S of Malaga	70.3	70.6	70.8	71.3
Lakeshore Dr/	Avenue 6-Dwy 2	68.9	74.2	74.3	70.1
	Dwy 2 - Diamond	69.6	69.9	70.0	70.8
	Diamond - Campbell	70.5	70.8	71.0	71.3
	Campbell - Malaga	69.9	70.2	70.4	70.8
Diamond Circle/	Diamond-Dwy3	NA	0.0	61.8	61.8
	Dwy 3-Dwy 1	NA	NA	NA	NA
	Dwy 1-Sylvester	47.8	47.8	47.8	47.8
	S of Sylvester	47.8	47.8	47.8	47.8
Campbell St/	Diamond-Lakeshore	61.1	61.3	64.0	64.0
	E of Lakeshore	62.8	63.0	63.0	63.2
Pete Lehr Dr/	W of Diamond	52.6	52.6	52.6	52.6
Sylvester St/	W of Diamond Cir	47.8	47.8	47.8	47.8
	Diamond Cir-Dwy 4	50.9	50.9	50.9	50.9
	Dwy 4-Diamond	50.9	50.9	50.9	50.9
	Diamond-Dwy 8	58.3	58.6	59.3	61.5
	Dwy 8-Lakeshore	58.3	58.6	59.3	61.5
Malaga Rd/	E of Lakeshore	61.8	62.2	62.2	63.2

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

Segment		2014	2014 w/Project	2014 w/Project and Cumult.
Railroad Canyon Rd/	N of Summerhill	72.9	73.1	74.5
Auto Center Dr/	N of Diamond	66.8	67.7	68.4
Casino Dr/	S of Diamond	66.5	67.1	67.5
	N of Malaga	66.5	67.1	67.5
Diamond Dr/	Summerhill - I-15 NB Ramps	74.7	74.9	75.9
	I-15 NB Ramps - I-15 SB Ramps	73.6	74.1	75.2
	I-15 SB Ramps-Auto Center	71.9	73.1	74.3
	Auto Center-Lakeshore	70.5	72.4	73.8
	Lakeshore-Dwy 5	62.5	68.5	70.7
	Dwy 5 -Campbell	62.5	66.9	69.8
	Campbell-Dwy 6	59.0	62.3	68.0
	Dwy 6 - Dwy 7	57.8	63.0	68.2
	Dwy 7 - Sylvester	57.8	63.0	68.2
	S of Sylvester	59.0	61.1	68.4
Mission Trail/	S of Malaga	70.7	71.8	72.4
Lakeshore Dr/	Avenue 6-Dwy 2	69.3	70.2	71.2
	Dwy 2 - Diamond	70.1	70.8	71.8
	Diamond - Campbell	70.9	71.8	72.3
	Campbell - Malaga	70.4	71.1	71.7
Diamond Circle/	Diamond-Dwy3	0.0	68.4	68.4
	Dwy 3-Dwy 1	0.0	65.7	65.7
	Dwy 1-Sylvester	47.8	63.6	63.6
	S of Sylvester	47.8	58.3	58.3
Campbell St/	Diamond-Lakeshore	61.5	67.8	67.8
	E of Lakeshore	63.2	63.4	63.5
Pete Lehr Dr/	W of Diamond	NA	NA	NA
Sylvester St/	W of Diamond Cir	47.8	47.8	47.8
	Diamond Cir-Dwy 4	50.9	62.9	62.9
	Dwy 4-Diamond	50.9	63.6	63.6
	Diamond-Dwy 8	58.6	64.3	65.6
	Dwy 8-Lakeshore	58.6	64.3	65.6
Malaga Rd/	E of Lakeshore	62.3	63.0	64.4

Table 5 (continued)
Diamond Center Project
Traffic Noise Impact Analysis
(dBA CNEL at 50 feet from centerline)

Segment		2016	2016 w/Project	2016 w/Project and Cumult.
Railroad Canyon Rd/	N of Summerhill	73.1	73.3	75.1
Auto Center Dr/	N of Diamond	67.0	68.0	69.1
Casino Dr/	S of Diamond	66.8	67.4	67.9
	N of Malaga	66.8	67.4	67.9
Diamond Dr/	Summerhill - I-15 NB Ramps	74.8	75.2	76.5
	I-15 NB Ramps - I-15 SB Ramps	73.7	74.4	75.8
	I-15 SB Ramps-Auto Center	72.1	73.4	75.0
	Auto Center-Lakeshore	70.7	72.7	74.6
	Lakeshore-Dwy 5	62.6	69.0	71.7
	Dwy 5 -Campbell	62.6	67.8	71.1
	Campbell-Dwy 6	59.3	64.8	70.0
	Dwy 6 - Dwy 7	57.8	64.3	69.8
	Dwy 7 - Sylvester	57.8	64.0	69.7
	S of Sylvester	59.3	62.0	70.0
Mission Trail/	S of Malaga	70.9	72.1	73.0
Lakeshore Dr/	Avenue 6-Dwy 2	69.5	70.5	71.9
	Dwy 2 - Diamond	70.2	71.3	72.6
	Diamond - Campbell	71.1	72.1	72.8
	Campbell - Malaga	70.5	71.3	72.1
Diamond Circle/	Diamond-Dwy3	0.0	68.4	68.4
	Dwy 3-Dwy 1	0.0	65.7	65.7
	Dwy 1-Sylvester	47.8	63.6	63.6
	S of Sylvester	47.8	58.3	58.3
Campbell St/	Diamond-Lakeshore	61.6	68.3	68.3
	E of Lakeshore	62.0	63.6	63.8
Pete Lehr Dr/	W of Diamond	NA	NA	NA
Sylvester St/	W of Diamond Cir	47.8	47.8	47.8
	Diamond Cir-Dwy 4	50.9	62.9	62.9
	Dwy 4-Diamond	50.9	63.6	63.6
	Diamond-Dwy 8	59.0	65.5	67.0
	Dwy 8-Lakeshore	59.0	65.2	66.8
Malaga Rd/	E of Lakeshore	62.5	63.2	65.1

Table 5 (continued)
Diamond Center Project
Traffic Noise Impact Analysis
(dBA CNEL at 50 feet from centerline)

Segment		Existing	Build-Out	Build-Out w/Project
Railroad Canyon Rd/	N of Summerhill	72.4	76.9	77.0
Auto Center Dr/	N of Diamond	66.4	70.8	71.3
Casino Dr/	S of Diamond	66.2	74.1	74.2
	N of Malaga	66.2	67.8	68.3
Diamond Dr/	Summerhill - I-15 NB Ramps	74.2	75.7	76.0
	I-15 NB Ramps - I-15 SB Ramps	73.1	75.5	76.0
	I-15 SB Ramps-Auto Center	71.5	75.3	76.0
	Auto Center-Lakeshore	70.0	75.2	76.0
	Lakeshore-Dwy 5	62.0	72.9	74.1
	Dwy 5 -Campbell	62.0	73.2	74.0
	Campbell-Dwy 6	58.6	71.7	72.3
	Dwy 6 - Dwy 7	57.4	71.6	72.2
	Dwy 7 - Sylvester	57.4	72.1	72.6
	S of Sylvester	58.6	72.1	72.3
Mission Trail/	S of Malaga	70.3	72.5	73.4
Lakeshore Dr/	Avenue 6-Dwy 2	68.9	74.0	74.4
	Dwy 2 - Diamond	69.6	74.2	74.7
	Diamond - Campbell	70.5	72.9	73.6
	Campbell - Malaga	69.9	72.8	73.3
Diamond Circle/	Diamond-Dwy3	NA	0.0	69.6
	Dwy 3-Dwy 1	NA	0.0	65.7
	Dwy 1-Sylvester	47.8	47.8	63.6
	S of Sylvester	47.8	47.8	58.3
Campbell St/	Diamond-Lakeshore	61.1	62.6	68.5
	E of Lakeshore	62.8	63.5	63.8
Pete Lehr Dr/	W of Diamond	52.6	NA	NA
Sylvester St/	W of Diamond Cir	47.8	47.8	47.8
	Diamond Cir-Dwy 4	50.9	50.9	62.9
	Dwy 4-Diamond	50.9	50.9	63.6
	Diamond-Dwy 8	58.3	64.4	67.4
	Dwy 8-Lakeshore	58.3	64.4	67.2
Malaga Rd/	E of Lakeshore	61.8	68.4	68.6

Table 6
Project and Cumulative Impacts
(dBA CNEL at 50 feet from centerline)

Segment		Project Only Impacts 2012	Project Only Impacts 2014	Project Only Impacts 2016	Cumulative Impacts
Railroad Canyon Rd/	N of Summerhill	0.1	0.2	0.3	**4.6**
Auto Center Dr/	N of Diamond	0.2	0.8	1.0	**4.9**
Casino Dr/	S of Diamond	0.1	0.6	0.6	**8.0**
	N of Malaga	0.1	0.6	0.6	2.1
Diamond Dr/	Summerhill - I-15 NB Ramps	0.1	0.3	0.3	1.8
	I-15 NB Ramps - I-15 SB Ramps	0.2	0.6	0.6	2.8
	I-15 SB Ramps-Auto Center	0.3	1.1	1.2	**4.5**
	Auto Center-Lakeshore	0.5	1.9	2.1	**6.0**
	Lakeshore-Dwy 5	2.2	**6.0**	**6.4**	**12.1**
	Dwy 5 -Campbell	1.4	**4.4**	**5.2**	**12.0**
	Campbell-Dwy 6	1.2	**3.3**	**5.5**	**13.7**
	Dwy 6 - Dwy 7	1.0	**5.2**	**6.4**	**14.8**
	Dwy 7 - Sylvester	1.0	**5.2**	**6.1**	**15.2**
	S of Sylvester	0.6	2.1	2.7	**13.7**
Mission Trail/	S of Malaga	0.2	1.0	1.2	**3.1**
Lakeshore Dr/	Avenue 6-Dwy 2	0.1	0.9	1.0	**5.5**
	Dwy 2 - Diamond	0.2	0.7	1.1	**5.0**
	Diamond - Campbell	0.2	0.9	1.0	**3.1**
	Campbell - Malaga	0.2	0.8	0.8	**3.3**
Diamond Circle/	Diamond-Dwy3	NA	NA	NA	NA
	Dwy 3-Dwy 1	NA	NA	NA	NA
	Dwy 1-Sylvester	0.0	**15.8**	**15.8**	**15.8**
	S of Sylvester	0.0	**10.4**	**10.4**	**10.4**
Campbell St/	Diamond-Lakeshore	2.7	**6.3**	**6.6**	**7.4**
	E of Lakeshore	0.0	0.2	1.6	1.0
Pete Lehr Dr/	W of Diamond	NA	NA	NA	NA
Sylvester St/	W of Diamond Cir	0.0	0.0	0.0	0.0
	Diamond Cir-Dwy 4	0.0	**12.0**	**12.0**	**12.0**
	Dwy 4-Diamond	0.0	**12.8**	**12.8**	**12.8**
	Diamond-Dwy 8	0.7	**5.6**	**6.5**	**9.1**
	Dwy 8-Lakeshore	0.7	**5.6**	**6.3**	**9.0**
Malaga Rd/	E of Lakeshore	0.0	0.7	0.8	**6.8**

NA = Not Available
Bolded entries indicate the significance threshold of +3.0 dB CNEL is exceeded

Table 7
Roadway Segments with Potentially Significant Noise Impacts
(dB CNEL)

Segment	Project Impact in 2014	Project Impact in 2016	Project Impact at Build-out
Diamond Drive/			
Lakeshore-Dwy 5*	6.0	6.4	1.2
Dwy 5 –Campbell*	4.4	5.2	0.8
Campbell-Dwy 6*	3.3	5.5	0.6
Dwy 6 - Dwy 7*	5.2	6.4	0.6
Dwy 7 – Sylvester*	5.2	6.1	0.5
Diamond Circle/			
Dwy 1-Sylvester*	15.8	15.8	15.8
S of Sylvester**	10.4	10.4	10.4
Campbell St/			
Diamond-Lakeshore*	6.3	6.6	5.9
Sylvester St/			
Diamond Cir-Dwy 4*	12.0	12.0	12.0
Dwy 4-Diamond*	12.8	12.8	12.8
Diamond-Dwy 8*	5.6	6.5	3.0
Dwy 8-Lakeshore**	5.6	6.3	2.9

*Within project site
** No existing adjacent residential uses

Each segment that exceeds the +3.0 dB CNEL significance threshold is either contained on the project site or has no existing adjacent residential use. Most potentially significant impacts are rendered less than significant in the future at build-out when the background traffic noise level is higher and the projects contribution to the overall noise environment is diluted. However, in the future, there may be residential uses to the south of the site as per the East Lake Specific Plan. No site plan is yet available but if residences are constructed adjacent to Sylvester Street, traffic noise levels at build-out could be as high as 67 dB CNEL at 50 feet from the roadway centerline. Traffic noise levels could be potentially significant if homes are sited closer than 68 feet from the roadway centerline and no noise wall were erected. Therefore, traffic noise levels are determined to be less-than-significant if homes are sited at least 68 feet from the Sylvester Street centerline or if a sound wall is constructed. If homes are built at less than this setback distance, or if a soundwall is not practical, then impacts are potentially significant.

Cumulative Only Impacts

Cumulatively, traffic noise will increase both from area growth and from the implementation of other area projects. By area build-out traffic noise will have increased substantially along many roadways. Traffic volume changes from infill development and from conversion of existing uses will substantially increase in the future and will modify the area's acoustic environment. Though noise-level differences between "with project" versus "no project" scenarios have been determined to be individually less-than-significant, cumulative impacts are not.

Cumulatively, traffic noise will increase both from area growth and from the implementation of other area projects. Cumulative impacts are defined as the difference between the "build-out with project" scenario and "existing" noise levels. As seen in Table 6, at 50 feet from roadway centerline, most segments will experience potentially significant cumulative impacts. However, with the exception of on-site roadway segments, the project itself does not contribute substantially to this impact and the noise increases would occur even without project implementation. Therefore, cumulative impacts due to project implementation are judged to be less-than-significant.

ON-SITE NOISE ANALYSIS

Within the project site, several area roadways will experience traffic noise impacts exceeding 65 dB CNEL at 50 feet from roadway centerline and may impact proposed residential uses. Specifically, these roadways are:

Maximum Interior Roadway Traffic Noise
Build-Out With Project

Roadway Segment	dB CNEL at 50 feet from centerline	Distance to 65 dB CNEL (feet)
Sylvester Street/		
W of Diamond Circle	48	<50
Diamond Circle to Lakeshore	67	68
Diamond Circle/		
Diamond Drive-Sylvester St.	70	108
Diamond Drive/		
Sylvester to Diamond Circle	73	171
Diamond Circle to Lakeshore Dr.	74	200
Lakeshore Drive/		
Diamond Drive adjacent	75	233

Noise impacts along these segments would be potentially significant for possible residential uses if built without recommended mitigation measures. As long as residences are sited 50 feet from the centerline along Sylvester Street, no additional noise mitigation will be necessary for the projected General Plan build-out traffic volumes on this roadway within the project site. Possible residences along the other roadways would require the above indicated setbacks in order to achieve 65 dB CNEL with no additional mitigation. If it is not possible to meet these setbacks then additional mitigation may be required. Such mitigation includes noise walls or orienting patios or outdoor recreational space away from the roadway. These measures must be evaluated when a detailed site plan is available. Therefore, with recommended mitigation, on-site traffic noise impacts for possible residential uses are reduced to less than significant.

ON-SITE NOISE GENERATION

In addition to residential uses, the project proposes the development of commercial and office land uses within the Diamond Center Specific Plan site. The City will require the developer of this the specific plan to evaluate any potential noise impacts that may be associated with any commercial land uses that may be proposed. Although detailed users have not yet been identified for the commercial and commercial land uses, they will be restricted to "Community Commercial Uses" which are typically lower in intensity than larger retail and commercial areas. Typical noises that may be generated by commercial land uses include alarm systems, truck deliveries, landscaping maintenance and maintenance services. General Plan Policies 8.3 and 8.12 relate to possible mixed-use noise conflicts and state as follows:

> **8.3** Require that mixed use structures and areas be designed to prevent transfer of noise and vibration form commercial areas to residential areas.
>
> **8.12** Discourage the placement of residences and other sensitive uses in proximity to commercial and industrial and outdoor recreational uses that feature substantial stationary noise sources.

Uses for large and more noise prone uses such as grocery stores or restaurants operate under conditional use permits (CUP). CUP's contain specific conditions to minimize noise impacts to adjacent uses. Although the exact mix of commercial tenants is unknown, mechanisms, such a permit conditions, are in place to ensure that future mixed use nature of the project site will maintain compatibility with respect to noise generation. The City of Lake Elsinore Municipal Code further restricts the level of noise that may be created upon residential properties from commercial activities. The code restricts the increased level of noise as no more than 5 dB greater than ambient conditions without such a source. While care must be taken in mixed-use communities to minimize noise conflict between dissimilar uses, adequate remedies exist to maintain impact potential at less than significant.

SUMMARY OF NOISE CONTROL FEATURES

Construction activities from project development should not affect the nearest off-site residential uses. However, compliance with City of Lake Elsinore Noise Standards requires that:

- Construction activities are limited to the hours of 7:00 a.m. and 8:00 p.m. Monday through Saturday. Construction is not permitted on any national holiday or on any Sunday.

- All construction equipment shall use properly operating mufflers.

On-site roadway traffic noise levels are compatible for proposed Diamond Center commercial and office uses. Residential uses will be within recommended compatibility design levels either with site design (adequate setback from the roadway) or supplemental controls (e.g. noise walls).

Possible future off-site residential uses to the south of the project site approved in the East Lake Specific Plan, will experience less-than-significant traffic noise impacts at build-out if residences are sited at least 68 feet from the Sylvester Street centerline or incorporate supplemental mitigation such as sound walls. Impacts should be evaluated when a detailed site plan is made available.
On-site residential mixed uses will utilize design measures to minimize conflicts. Additionally conditional use permits (CUPs) will contain specific conditions to minimize noise impacts to adjacent uses.