Palm Springs Country Club (TTM 36691) Noise Impact Study

Prepared By: Endo Engineering

May 2014

Endo Engineering *Traffic Engineering* *Air Quality Studies* *Noise Assessments*

May 6, 2014

Mr. Eric Taylor and Mr. Behrooz Haverim
Palm Springs Country Club, LLC
1200 North Bundy Drive
Los Angeles, CA 90049

SUBJECT: ***Noise Impact Analysis for Tentative Tract Map #36691 Proposed on the Former Palm Springs Country Club Site***

Gentlemen;

Endo Engineering is pleased to submit this evaluation of the noise impacts associated with a proposed General Plan Amendment, Planned Development District, and Tentative Tract Map 36691 to permit the development of up to 441 low-density residential dwelling units and the dedication of a 5.37-acre site for a future public park in the City of Palm Springs, California. The project would replace the fallow former Palm Springs Country Club Golf Course and clubhouse facilities on a site with 156.18 gross acres located east of Sunrise Way and north of Verona Road. It would permit the construction of 137 multi-family attached cluster dwelling units in the North Village, with access east of Sunrise Way via the intersection of San Rafael Drive/Golden Sands Drive. In addition, up to 304 single-family detached dwellings would be constructed in the South Village, with access via Whitewater Club Drive, north of Verona Road.

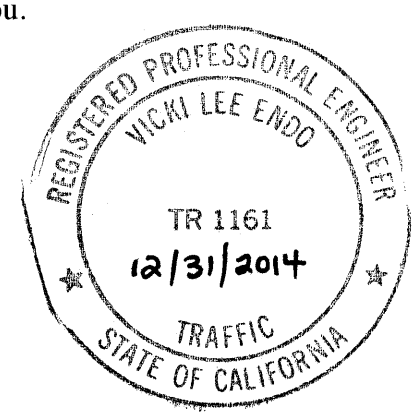
The format of this report is consistent with the requirements of the City of Palm Springs. The pages which follow briefly summarize in graphic and narrative form: (1) the existing noise environment in the project vicinity; (2) future year 2020 noise levels with and without the proposed project; and (3) General Plan buildout (year 2030) conditions with and without the proposed project. We trust that the information provided herein will be of use in the preparation of the required environmental documentation and assist the City of Palm Springs in their review of the impacts and conditions of approval associated with the project. In the event that questions or comments arise regarding the findings and recommendations within this report, please do not hesitate to contact Endo Engineering by telephone or electronic mail at endoengr@cox.net. We look forward to discussing our findings and recommendations with you.

Cordially,

ENDO ENGINEERING

Vicki Lee Endo

Vicki Lee Endo, P.E., T.E.
Registered Professional
Traffic Engineer TR 1161



28811 Woodcock Drive, Laguna Niguel, CA 92677-1330
Phone: (949) 362-0020 E-Mail:endoengr@cox.net

NOISE IMPACT STUDY

FOR TENTATIVE TRACT MAP NO. 36691

(THE FORMER PALM SPRINGS COUNTRY CLUB SITE)

EAST OF SUNRISE WAY AND NORTH OF VERONA ROAD,
WITH ACCESS TO SAN RAFAEL DRIVE AND WHITEWATER CLUB DRIVE

CITY OF PALM SPRINGS

MAY 6, 2014

Prepared For

Mr. Eric Taylor & Mr. Behrooz Haverim
PALM SPRINGS COUNTRY CLUB, LLC
1200 North Bundy Drive
Los Angeles, CA 90049

Prepared By

ENDO ENGINEERING
28811 Woodcock Drive
Laguna Niguel, CA 92677
Phone: (949) 362-0020
E-Mail: endoengr@cox.net

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1.0 EXECUTIVE SUMMARY

1.1 NOISE SETTING

1. The primary sources of noise in the study area are transportation related and include the Palm Springs International Airport, the Union Pacific Railroad, the Interstate 10 freeway, and master planned roadways.

2. Ambient noise levels emanating from area roadways currently range from a low of 52.9 CNEL (at 50 feet from the centerline of Via Escuela, east of Gene Autry Trail) to a high of 79.8 CNEL (at 50 feet from the centerline of Vista Chino, east of Farrell Drive).

3. The 70 dBA contour presently falls within the right-of-way along sixteen of the thirty-eight roadway segments analyzed.

4. The 65 CNEL contour is located within the right-of-way along thirteen of the roadway segments evaluated.

5. The composite year 2002 and 2020 average annual 60 CNEL contour associated with the Palm Springs International Airport (which is used to evaluate land use compatibility with noise) is located approximately 700 feet from the project site at its closest point.

6. The project site is located 1.2 miles south of the Union Pacific Railroad corridor which generates 65 CNEL noise contours 900 feet from the tracks.

7. The project site is located approximately 1.5 miles south of the Interstate 10 freeway, which generates 60 CNEL noise contours 3,300 feet from the freeway centerline.

1.2 NOISE IMPACTS

1. Construction activities on-site will result in short-term increases in noise levels adjacent to site access routes and the on-site areas under construction.

2. Motor vehicle noise increases resulting from the proposed project will constitute a long-term incremental adverse noise impact in the vicinity.

3. The proposed project would generate an audible noise increase of 3.2 dBA in the year 2020 and 3.1 dBA in the year 2030 along Whitewater Club Drive, between Via Escuela and Verona Road. The noise level at 50 feet from the centerline of Whitewater Club Drive at this location is projected to be less than 60 CNEL following the addition of site traffic which is considered a normally acceptable noise exposure for single-family land uses of conventional construction.

4. Imperceptible noise increases of 3.0 dBA or less are projected to occur with the proposed project in the year 2020 and year 2030 along all of the other roadway segments evaluated in the project vicinity.

1.3 NOISE MITIGATION

The following specific mitigation measures are recommended for incorporation in the project to minimize noise impacts and insure compliance with applicable noise standards.

1. Construction activities within the project site shall be limited to the hours between 7:00 a.m. and 7:00 p.m. on weekdays and between 8:00 a.m. and 5:00 p.m. on Saturdays, as specified by the *Palm Springs Municipal Code* Construction Site Regulations (Chapter 8.04.220) if the noise produced is of such intensity or quality that it disturbs the peace and quiet of any other person of normal sensitivity. Construction work shall not be permitted on Sundays or six major holidays, when residents are more likely to be at home. Activities conducted as part of the implementation of an approved fugitive dust control program are exempt from these limitations.

2. All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers and the engines shall be equipped with shrouds.

3. All construction equipment shall be in proper working order and maintained in a proper state of tune to reduce backfires.

4. Stockpiling and vehicle staging areas shall be located as far as practical from noise-sensitive receptors.

5. Parking, refueling and servicing operations for all heavy equipment and on-site construction vehicles shall be located as far as practical from existing homes.

6. Every effort shall be made during construction activities to create the greatest distance between noise sources and noise-sensitive receptors located in the vicinity of the project site.

7. Stationary equipment shall be placed such that emitted noise is directed away from noise-sensitive receptors.

8. Future on-site development shall comply with all relevant noise policies set forth in the Noise Element of the General Plan.

9. The project shall comply with all requirements identified in the *Riverside County Airport Land Use Compatibility Plan Policy Document* (adopted March 2005) related to residential development within the Palm Springs International Airport Influence Area, as discussed on pages 4-14 and 4-15.

2.0 PROJECT LOCATION AND DESCRIPTION

2.1 PROJECT LOCATION

The project site is comprised of 156.18 gross acres (125.88 net acres) formerly developed as the Palm Springs Country Club. Figure 2-1 illustrates the project in its regional context within the City of Palm Springs, California. The project site is generally located south of Interstate 10, north of Vista Chino (State Highway 111), east of Sunrise Way, and west of Gene Autry Trail and the Whitewater River Channel.

Figure 2-2 illustrates the project site in its local context including the extent of the two on-site planning areas known as the North Village and the South Village. As shown therein, the North Village is more precisely located south of Four Seasons Boulevard and north of East San Rafael Drive, between Sunrise Way and Farrell Drive. The South Village is north of Verona Road and south of San Rafael Drive, between Farrell Drive and North Whitewater Club Drive.

Figure 2-2 shows the study area and the ten intersections for which current and future traffic volume projections were available from the *Traffic Impact Study For Tentative Tract Map No. 36691* (Endo Engineering; February 10, 2014). These traffic volume projections were modeled to quantify the current and future motor vehicle noise levels.

2.2 PROJECT DESCRIPTION

Existing On-Site Land Uses

The project site was previously developed as the Palm Springs Country Club, which included: a private golf course, a driving range, and a clubhouse with four tennis courts. The Palm Springs Country Club was sustained by daily fee golfers until economic conditions forced its closure. Once reopening the golf course was determined to no longer be feasible, the clubhouse structure was demolished and removed from the site. The foundation of the clubhouse and the tennis courts and paved parking area remain in the southeast corner of the South Village Planning Area. The turf associated with the fallow 18-hole golf course was removed and the surface soil was chemically stabilized to minimize erosion.

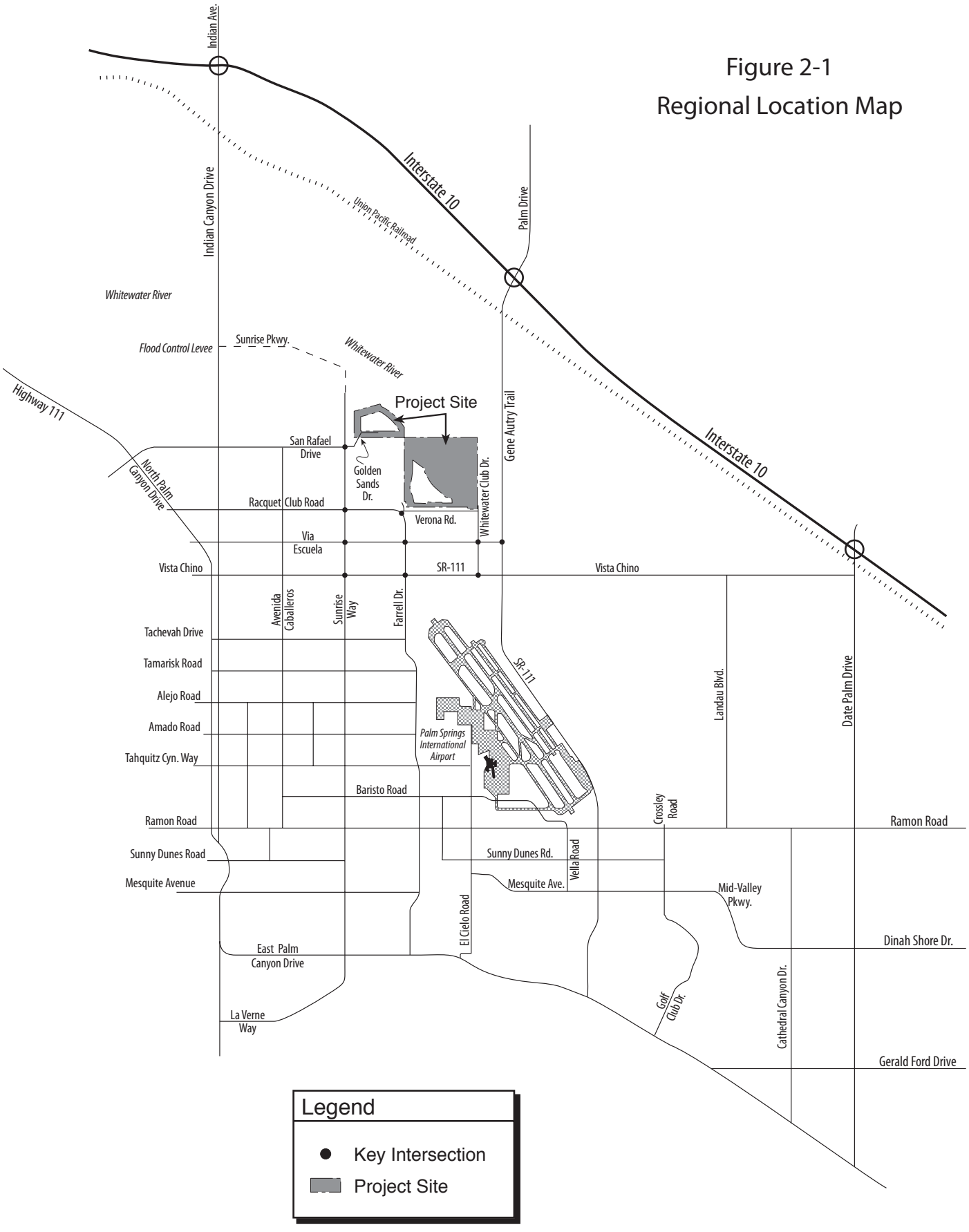
A flood control levee separates the development area within the South Village from the Whitewater River Channel and a 24.93-acre triangular remainder Lot "L" within the South Village Planning Area. In the year 2016, construction is scheduled to begin on a 52-mile regional multi-purpose trail known as the CV Link. The CV Link is currently being planned along the Whitewater River Channel flood control levee.

Existing Entitlements

The project site has no existing entitlements. The General Plan land use designation for the portion of the project site located west of the Whitewater River levee is Open Space-Parks and Recreation. The General Plan land use designation for the contiguous parcel, located east of the Whitewater River levee, is Open Space Conservation.

The existing zoning designation of the North Village is primarily Open Space with a portion designated O-5 (open space with 5-acre minimum lots) and a smaller portion designated as

Figure 2-1
Regional Location Map



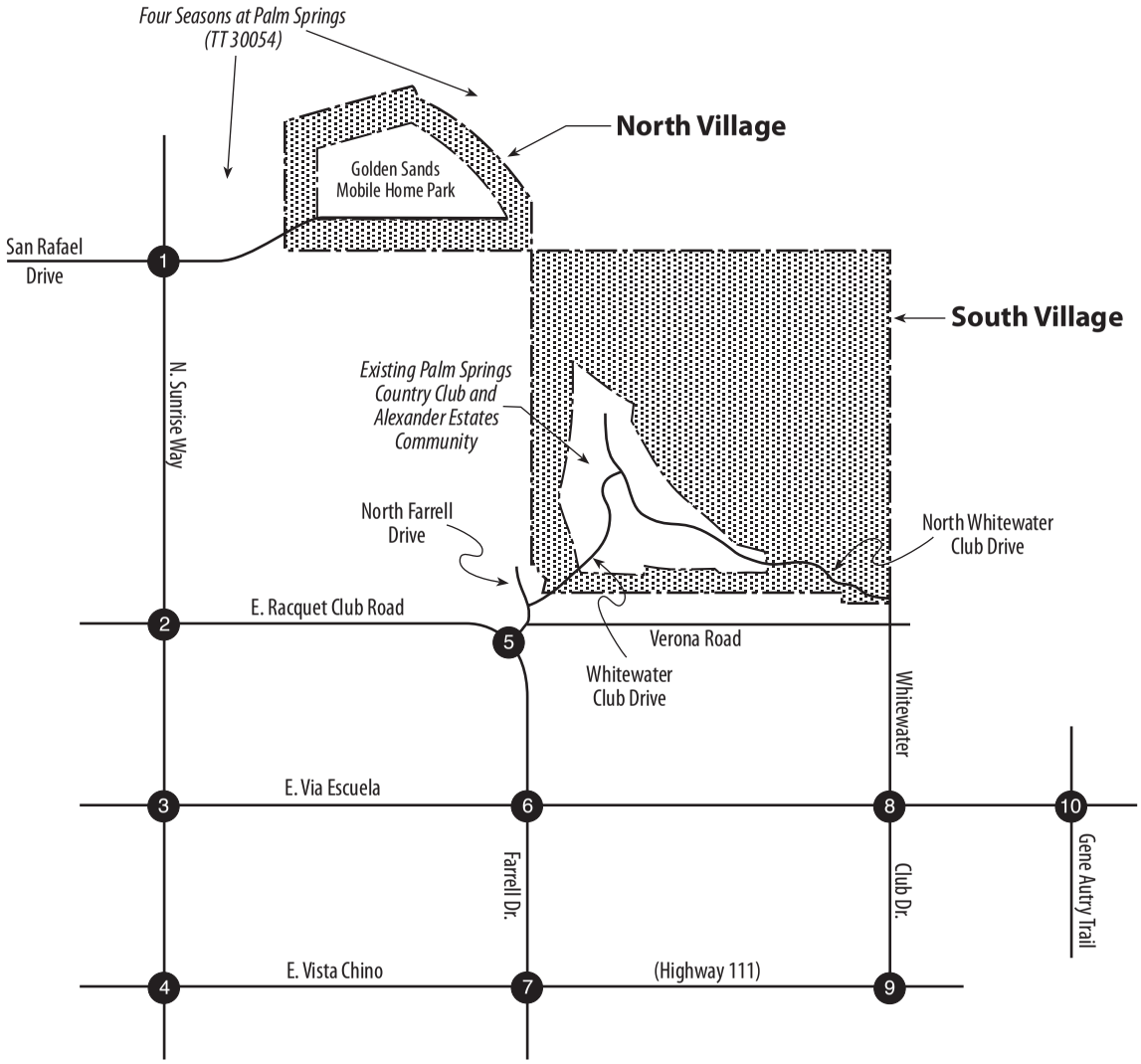
Legend

- Key Intersection
- Project Site

Endo Engineering

Scale: 1" = 5,700'

Figure 2-2
Vicinity Map



Legend

- Key Intersection
- Project Site

Endo Engineering

Scale: 1" = 1380'

R-1-C (single-family residential with 10,000 square-foot minimum lots). The existing zoning of the South Village (the area west of the levee) is O or O-5 (open space with 5-acre minimum lots). The parcel located east of the Whitewater River levee is zoned W (watercourse). Although the former golf course was a compatible use within the Open Space-Conservation designation, the low-density residential land uses currently proposed would require a Planned Development District in lieu of a zone change.

Proposed Development

The proposed project would include: (1) a General Plan Amendment from Private Open Space to Residential Low-4, and (2) a Planned Development District in lieu of a Zone Change to permit a low-density residential land use and a public park site to replace the former golf course and golf clubhouse. The residential density with the proposed project would be approximately 3.6 dwelling units per acre.

The public park site proposed at the southeast corner of the South Village would be deeded to the City of Palm Springs and have public access via North Whitewater Club Drive, outside the gated project entry. The 5.37-acre park site could serve as a trailhead for the planned CV Link, a regional corridor for a Coachella Valley multi-purpose trail to be located along the adjacent flood control levee.

The project proposes the development of a combined total of up to 441 residential dwelling units with direct access via East San Rafael Drive (east of North Sunrise Way) and North Whitewater Club Drive (like the former golf clubhouse). The North Village would be developed with 137 multi-family attached clustered dwelling units on 17.9 net acres, as shown in Figure 2-3. The South Village would be developed with up to 304 single-family detached dwelling units on 45.89 net acres, as shown in Figure 2-4.

Proposed Internal Circulation and Site Access

The project would be developed as a gated community with access via two gated access points located at the southwest corner of the North Village Planning Area and a third gated access located at the southeast corner of the South Village Planning Area, adjacent to the future public park site. The North Village and South Village Planning Areas would be connected via an internal roadway that would allow uncontrolled access between the two development areas within the site.

The existing Golden Sands Mobile Home Park would be surrounded on all sides by the North Village Planning Area. Residents and visitors associated with the Golden Sands Mobile Home Park currently use Golden Sands Drive and East San Rafael Drive to access North Sunrise Way.

Three single-lane roundabouts are proposed in conjunction with the proposed development with geometric features that would encourage slow travel speeds through the roundabout. A roundabout is proposed at the primary entry to the North Village, at the primary entry to the South Village and at the point where an internal connection is proposed between the two villages. A single-lane roundabout is proposed on North Whitewater Drive, north of Verona Road, to facilitate access to the gated South Village development and provide public access to the future public park proposed immediately north of the roundabout. People destined to and from the park will not be required to pass through the entry gates associated with the South Village.

To facilitate access via the two gated entries associated with the North Village Planning Area, East San Rafael Drive (east of North Sunrise Way) would be reconstructed with a

Figure 2-3
Site Development Plan - North Village

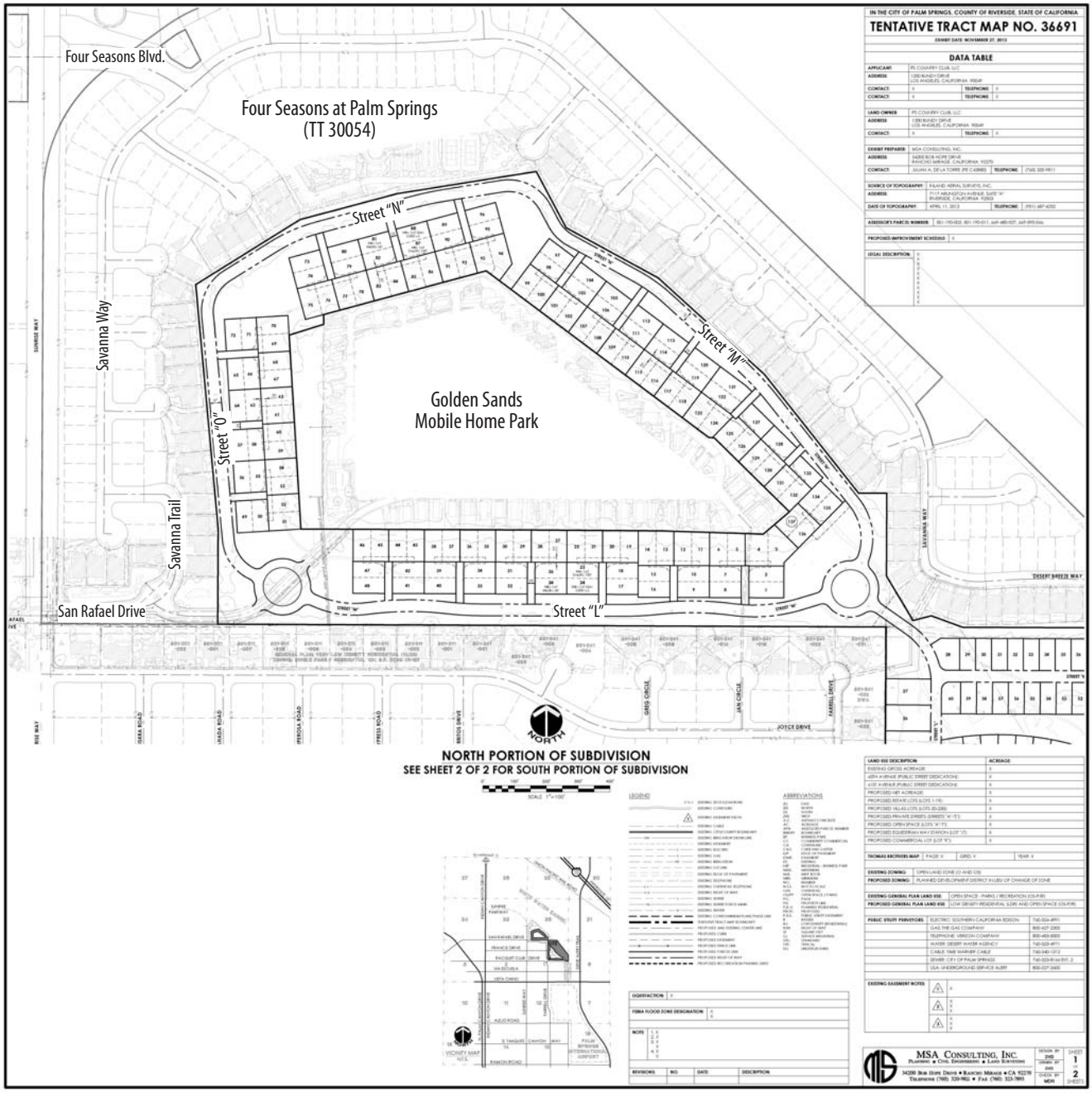


Figure 2-4
Site Development Plan - South Village

single-lane roundabout with yield control on all entries. Motor vehicles destined to/from the Golden Sands Mobile Home Park would pass through this roundabout without being required to pass through the entry gates designed to limit access to the North Village or the Four Seasons at Palm Springs community.

A proposed access and utility easement (90 feet in width) located adjacent to the flood control levee would include a 20-foot wide emergency access that would also function as a pedestrian, bicycle and neighborhood electric vehicle (NEV) path. A 24-foot wide gated emergency access is proposed to Farrell Drive, opposite the intersection of Francis Drive. This emergency access would be located between two existing residences located west of the South Village Planning Area. A Knox-Box Rapid Entry System would be installed at the gate to facilitate emergency access by fire fighters and other emergency first responders.

The proposed project includes two emergency access connections to Whitewater Club Drive, east of Farrell Drive, at the southwest corner of the gated existing Palm Springs Country Club and Alexander Estates community. These two emergency access connections are proposed to alleviate potential concerns associated with two lengthy cul-de-sacs (Street "B" and Street "K") that are proposed within the site to provide independent access for the residential lots proposed immediately west of and south of the existing Palm Springs Country Club and Alexander Estates community. To facilitate access by emergency vehicles and other large vehicles, Street "B" would provide a turn around area near its mid-point (see Figure 2-4).

The residents of existing Palm Springs Country Club and Alexander Estates currently take access to the southwest via the intersection of Whitewater Club Drive with Farrell Drive. Whitewater Club Drive currently terminates at the gated eastern access associated with the existing Palm Springs Country Club and Alexander Estates residential community. The proposed development within the South Village would surround the existing Palm Springs Country Club and Alexander Estates gated community on all sides without taking access through that neighborhood.

With the proposed project, Whitewater Club Drive, north of Verona Road, would be realigned and a roundabout would be constructed to serve both the future public park site and the gated South Village residential development. Residents of the Alexander Estates community would be permitted to pass through the gated entry for the South Village, prior to accessing the gated entry to Alexander Estates. Future residents of the South Village, however, would not be permitted to enter or pass through the existing Palm Springs Country Club and Alexander Estates or use the existing gated entry located at southwest corner of the existing Palm Springs Country Club and Alexander Estates community near Farrell Drive.

Project and Construction Phasing

Demolition and site preparation activities are expected to begin in August of the year 2015. Site grading will occur during September 2015 and be completed in approximately three weeks. Trenching activities necessary to underground utilities are projected to require about twenty days to complete. Construction of the residential structures is expected to begin in April, 2016 and require up to 3.5 years to complete. This includes the time required to lay asphalt and pour concrete for the roadways, sidewalks, driveways, trails, and parking lots. Although the phasing of the development will be dictated by the demands of the marketplace, both planning areas could be fully developed and occupied in the year 2020.

2.3 PROJECT ALTERNATIVES

Alternative 1 represents the Preferred Alternative. Approximately 3,740 daily trip-ends would be generated on a typical weekday by the Preferred Alternative.

Alternative 2 would replace approximately 91 of the residential dwelling units proposed within the South Village Planning Area with a 20-acre soccer park site, which could accommodate eight soccer fields. Alternative 2 would generate 3,290 trip-ends per day, approximately 88 percent of the daily trip generation of the Preferred Alternative. Parking for the soccer park would be located outside of the gated residential areas. The North Village would not be gated with Alternative 2. The South Village would be developed with 213 single-family detached dwelling units.

Alternative 3 would include the development of the entire project site with 272 single-family detached dwelling units on 10,000 square-foot lots. Alternative 3 would generate approximately 2,610 trip-ends on a typical weekday, approximately 70 percent of the daily trip generation of the Preferred Alternative.

Alternative 4 represents the no development alternative. The project site would remain vacant with this alternative and would not generate trips.

2.4 EXISTING LAND USES IN PROJECT VICINITY

Existing Land Uses Surrounding the North Village Planning Area

The North Village Planning Area surrounds the existing Golden Sands Mobile Home Park which includes 139 spaces for mobile homes, three of which are not currently occupied. Access to this development is via Golden Sands Drive, a private street that extends east from the eastern terminus of East San Rafael Drive. When fully occupied, approximately 81 (inbound plus outbound) vehicles per hour would be expected to use East San Rafael Drive, east of Sunrise Way, for access to this mobile home park during the evening peak hour on an average weekday during the peak season. The 136 currently occupied mobile homes generate approximately 79 vehicles per hour (inbound plus outbound) during the evening peak hour on a weekday.

The North Village Planning Area is surrounded to the west, north, and east by the Four Seasons at Palm Springs gated community (Tract 30054). The primary access to this community of 238 single-family detached dwelling units is located northwest of the North Village, at the intersection of Four Seasons Boulevard and Sunrise Way.

Approximately 76 single-family dwellings are located south of Four Seasons Boulevard and north of San Rafael Drive, between Sunrise Way and the western boundary of the North Village. Residents of these dwellings can take access via the gated entry on Four Seasons Boulevard or the secondary gated access located on Savanna Trail, which intersects East San Rafael Drive, east of Sunrise Way. Both Savanna Trail and Savanna Way are private north/south residential streets with access to East San Rafael Drive via the gated southern access to Tract 30054.

Willdan Associates prepared the approved *"Palm Springs Country Club Residential Development Traffic Study"* (dated August 6, 2001) evaluating Tract 30054. Willdan estimated that approximately 20 percent of the trips generated by Tract 30054 were expected to use the southern gated access and San Rafael Drive (east of Sunrise Way) for access. That traffic assignment would result in approximately 48 (inbound plus outbound) vehicles

per hour passing through the southern gated access onto San Rafael Drive during the evening peak hour on an average weekday.

Existing Land Uses Surrounding the South Village Planning Area

The South Village Planning Area surrounds the gated residential community known as existing Palm Springs Country Club and Alexander Estates. This community includes 275 residences with access to and from North Farrell Drive via Whitewater Club Drive, at the southwest corner of the South Village. With the proposed project, the 23 single-family detached dwellings and 275 condominiums within this community would also have access through the South Village Planning Area via North Whitewater Club Drive (i.e., at the southeast corner of the South Village). North Whitewater Club Drive was the access to the former Palm Springs Country Club clubhouse.

2.5 CUMULATIVE DEVELOPMENT

Plans for the construction of cumulative developments have been disrupted by the economic recession. The growth in traffic volumes projected with the traffic model developed in conjunction with the *Palm Springs 2007 General Plan* update process have been utilized for this noise analysis, and are assumed to address future cumulative development within the study area. The year 2020 and year 2030 traffic volumes evaluated assume that Sunrise Parkway will be extended from Sunrise Way to Indian Canyon Drive.

3.0 EXISTING NOISE ENVIRONMENT

Noise in daily life fluctuates over time, with some fluctuations being minor while others are substantial. Some fluctuations are random while occurs exhibit regular patterns. Some noises seem relatively constant, while others change rapidly and vary widely. Some noises are of extremely short duration (transient) while others, like pile driver noise, are intermittent.

Noise fundamentals are introduced below including: noise rating schemes, typical noise levels of familiar noise sources, sound propagation, and various factors that affect motor vehicle noise levels. This fundamental information is followed by a discussion of: (1) the harmful effects of noise, (2) community responses to sound, (3) guidelines for achieving land use compatibility with noise, and (4) the current noise environment in the project vicinity. A glossary of technical terms related to noise is provided as Appendix A.

3.1 FUNDAMENTALS OF NOISE

Noise levels are measured on a logarithmic scale in decibels which are then weighted and added over a 24-hour period to reflect not only the magnitude of the sound, but also its duration, frequency, and time of occurrence. In this manner, various acoustical scales and units of measurement have been developed such as: equivalent sound levels (L_{eq}), day-night average sound levels (L_{dn}) and community noise equivalent levels (CNELs).

A-weighted decibels (dBA) approximate the subjective response of the human ear to a broad frequency noise source by discriminating against the very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear. The decibel scale has a value of 1.0 dBA at the threshold of human hearing and 140 dBA nearing the threshold of pain. Each interval of 10 decibels indicates a sound energy ten times greater than the previous level, which is perceived by the human ear as being roughly twice as loud.

Under controlled conditions in a laboratory, the trained healthy human ear is able to discern changes in sound levels of 1 dBA, when exposed to steady single frequency signals in the mid-frequency range. Outside of these controlled conditions, the trained ear can detect changes of 2 dBA in normal environmental noise. A 3.0 decibel increase in noise level reflects a doubling of the acoustic energy. It is widely accepted that the average healthy ear, however, can barely perceive noise level changes of 3 dBA.[1]

Human perception is complicated in that two identical noise sources do not sound twice as loud as one noise source. The human perception of loudness in terms of decibels and acoustical energy is not linear. If one source produces a noise level of 70 dBA, two identical sources would produce 73 dBA. Three identical noise sources would produce approximately 75 dBA, whereas ten identical noise sources would produce 80 dBA.

Acoustic experts have tested thousands of subjects to establish the relationship between changes in acoustical energy and the corresponding human reaction. Table 3-1 summarizes their findings. The average human perceives a 10 dBA decrease in noise levels as one-half of the original level, even though it exposes the average human to one-tenth of the acoustic energy associated with the reference sound. Although an increase of 3 dBA in noise level

1. Mr. Rudy Hendriks, Caltrans Environmental Engineering - Noise, Air Quality and Hazardous Waste Management Office, *Technical Noise Supplement,* October 1998, pg. 41.

exposes the listener to twice the acoustic energy of the noise level before the increase, it is perceived as a barely perceptible increase.

Table 3-1
Human Perception of Noise Level Changes

Noise Level Change (dBA)	Relative Energy Change	Perceived Change In Percentage	Descriptive Change In Human Perception
+40 dBA	10,000 x		Sixteen Times as Loud
+30 dBA	1,000 x		Eight Times as Loud
+20 dBA	100 x	+300%	Four Times as Loud
+15 dBA	31.6 x	+183%	
+10 dBA	10 x	+100%	Twice as Loud
+9 dBA	7.9 x	+87%	
+8 dBA	6.3 x	+74%	
+7 dBA	5.0 x	+62%	
+6 dBA	4.0 x	+52%	
+5 dBA	3.16 x	+41%	Readily Perceptible Increase
+4 dBA	2.5 x	+32%	
+3 dBA	2.0 x	+23%	Barely Perceptible Increase
+0 dBA	1	0%	Reference (No Change)
-3 dBA	0.5 x	-19%	Barely Perceptible Reduction
-4 dBA	0.4 x	-24%	
-5 dBA	0.316 x	-29%	Readily Perceptible Reduction
-6 dBA	0.25 x	-34%	
-7 dBA	0.20 x	-38%	
-8 dBA	0.16 x	-43%	
-9 dBA	0.13 x	-46%	
-10 dBA	0.10 x	-50%	One-Half as Loud
-15 dBA	0.0316 x	-65%	
-20 dBA	0.01 x	-75%	One-Quarter As Loud
-30 dBA	0.001 x		One-Eighth as Loud
-40 dBA	0.0001 x		One-Sixteenth as Loud

a. Mr. Rudy Hendriks, Caltrans, *Technical Noise Supplement*, October, 1998.
b. Change in relative energy with respect to a zero change in dBA (no change).
c. Average human perceived change in noise level. A positive change represents an increase. A negative change represents a decrease.

Typical Noise Levels of Common Activities

Examples of the decibel level of various noise sources are shown in Figure 3-1. The quiet rustle of leaves generates 10 dBA. Ambient noise levels in a motion picture studio are typically 20 dBA. Interior noise in a library measures 35 dBA. A theater or large conference room exhibits ambient noise levels of 40 dBA. Ambient noise outdoors in a quiet urban area is 50 dBA during the daytime and 40 dBA during the nighttime hours. Normal conversation at 5 feet generates 55 dBA. The noise level in a commercial area is typically 65 dBA. A busy street generates 75 dBA at 50 feet and 60 dBA at 300 feet. The ambient noise level in a noisy urban area during daytime hours is approximately 75 dBA.

An automobile horn can generate 100 decibels at a distance of 16 feet. By comparison, a mother holding a screaming infant in her arms is subjected to 100 to 117 decibels. A jackhammer generates 120 decibels at a distance of three feet. The Who is in the *Guinness Book of World Records* as the loudest rock band, for a 1976 concert at which the band generated a sound level of 120 decibels at a distance of 50 meters from the sound system. Football game crowds can cheer as loudly as a rock band can play. By comparison, jet fly-over at 1,000 feet generates 105 dBA.

Noise Rating Schemes

Equivalent sound levels are not measured directly but rather calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (L_{eq}) is the constant level that, over a given time period, transmits the same amount of acoustic energy as the actual time-varying sound. Equivalent sound levels are the basis for both the L_{dn} and CNEL scales.

Day-night average sound levels (L_{dn}) are a measure of the cumulative noise exposure of the community. The L_{dn} value results from a summation of hourly L_{eq} values over a 24-hour time period with an increased weighting factor applied to the nighttime period between 10:00 PM and 7:00 AM. This noise rating scheme takes into account those subjectively more annoying noise events which occur during the normal sleeping hours.

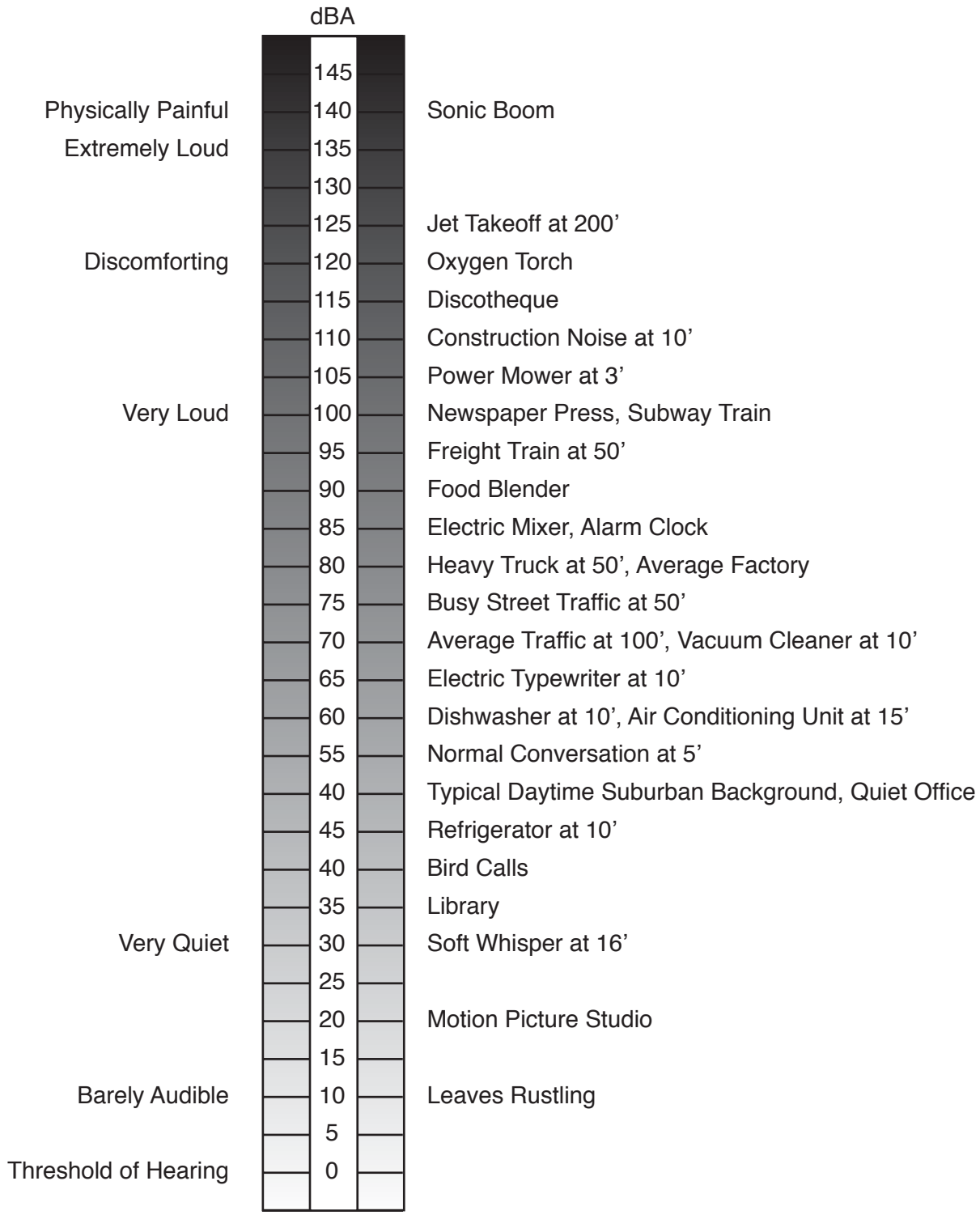
Community noise equivalent levels (CNEL) also carry a weighting penalty for noises that occur during the nighttime hours. In addition, CNEL levels include a penalty for noise events that occur during the evening hours between 7:00 PM and 10:00 PM. Because of the weighting factors applied, CNEL values at a given location will always be larger than L_{dn} values, which in turn will exceed L_{eq} values. However, CNEL values are typically within one decibel of the L_{dn} value.

As used in General Plan applications, the CNEL metric means the annualized daily sound level (the sum of 365 days of individual CNEL values divided by 365). The annualized CNEL reflects the fundamental theory that real community impacts are related to long-term noise exposure levels. That is why airport, railroad, and highway noise impact criteria are all based on annualized CNEL values.

Sound Propagation

For a "line source" of noise such as a heavily traveled roadway, the noise level drops off by a nominal value of 3.0 decibels for each doubling of distance between the noise source and the noise receiver. Environmental factors such as wind conditions, temperature gradients, characteristics of the ground (hard or soft) and the air (relative humidity), and the presence of vegetation combine to increase the attenuation achieved outside laboratory conditions to 4.5 decibels per doubling of distance in many cases.

Figure 3-1
Typical Noise Levels of Familiar Sources



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Source: Tipler, Paul A. "Physics", New York: Worth Publishers, 1976

The increase in noise attenuation in exterior environments is particularly true: (1) for freeways where an elevated or depressed profile, higher truck mix, or the presence of intervening buildings or topography come into play; (2) where the view of a roadway is interrupted by isolated buildings, clumps of bushes, scattered trees; (3) when the intervening ground is soft or covered with vegetation; or (4) where the source or receiver is located more than three meters above the ground. The nominal value of 3.0 dBA with doubling applies to sound propagation from a "line source": (1) over the top of a barrier greater than 3 meters in height; or (2) where there is a clear unobstructed view of the highway, the ground is hard, no intervening structures exist and the line-of-sight between the noise source and receiver averages more than 3 meters above the ground.[2]

In an area which is relatively flat and free of barriers, the sound level resulting from a single "point source" of noise drops by 6 decibels for each doubling of distance or 20 decibels for each factor of ten in distance. This applies to fixed noise sources and mobile noise sources which are temporarily stationary such as an idling truck or other heavy duty equipment operating within a confined area (such as the loading docks, or on-site construction activities).

Noise Shielding By Structures

One of the most effective ways of reducing noise is shielding. Shielding occurs when the observer's view of the noise source is obstructed by structures that interfere with the propagation of the sound waves. Shielding can be accomplished by using mufflers and shrouding on construction equipment or by erecting a sound barrier between the construction equipment and a noise receiver. A solid noise barrier wall can shield receivers by up to 20 dBA.

In a similar manner, the closest row of residences located along a roadway will acoustically shield the residents who live in the homes located behind the first row. The amount of attenuation provided by rows of buildings has a maximum value of 10 dBA and depends on the size of the gaps between the buildings. An attenuation of 3 dBA is typically allowed by the Federal Highway Administration (FHWA) for the first row of buildings, if they occupy 40 to 65 percent of the row, leaving gaps that occupy the remaining 35 to 60 percent of the row. An attenuation of 5 dBA is typically assumed when the buildings occupy 65 to 90 percent of the row, leaving 10 to 35 percent of the row as gaps. Rows of buildings behind the first row will also shield the area behind them and are typically assumed to attenuate the exterior sound levels behind them by 1.5 dBA for each row of buildings between the first row and the noise receptor.

In most situations, if the exterior area can be protected from excessive noise exposures, the interior will also be protected. The first step is to identify areas where frequent human use occurs (such as a patio, a porch, or a swimming pool). The interior noise levels may then be computed by subtracting the noise reduction expected to be provided by the building from the predicted exterior noise levels. Building noise reduction factors (from exterior to interior) range from a low of 10 dB (for all buildings with windows open) to a high of 35 dB (for masonry buildings with double-glazed windows). Masonry buildings with single-glazed windows achieve an exterior to interior noise reduction of 25 dB. Light frame buildings with ordinary sash windows closed achieve a 20 dB noise reduction. Light frame construction with storm windows can achieve a 25 dB reduction from outside to inside sound levels.

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2. State of California, Department of Transportation, *Noise Manual*, 1980.

Factors Affecting Motor Vehicle Noise

The noise levels adjacent to line sources, such as roadways, increase by 3.0 dBA with each doubling in the traffic volume, provided that the vehicle speed and truck mix do not change. From the mathematical expression relating increases in the number of noise sources (motor vehicles) to the increase in the adjacent sound level, it can be shown that a 26 percent increase in the traffic volume will cause a 1.0 dBA increase in adjacent noise levels. Doubling the number of vehicles on a given route increases the adjacent noise levels by 3.0 dBA. Changing the vehicle speed has a more dramatic effect on adjacent noise levels.

Increasing the vehicle speed from 35 miles per hour (mph) to 45 mph raises the adjacent noise levels by approximately 2.7 dBA. Raising the speed from 45 to 50 mph increases adjacent noise levels by 1.0 dBA. A speed increase from 50 to 55 mph increases adjacent noise levels by 0.9 dBA. Consequently, lower motor vehicle speeds can reduce adjacent noise levels substantially.[3]

The truck mix on a given roadway has a significant effect on adjacent noise levels. As the number of trucks increases and becomes a larger percentage of the vehicle volume, adjacent noise levels increase. This effect is more pronounced if the number of heavy-duty (3+ axle) trucks is large, compared to the number of medium-duty (2-axle) trucks.

3.2 HARMFUL EFFECTS OF NOISE

Noise can cause temporary physical and psychological responses in humans. Temporary physical reactions to passing noises range from a startle reflex to constriction in peripheral blood vessels, the secretion of saliva and gastric juices, and changes in heart rate, breathing patterns, the chemical composition of the blood and urine, dilation of pupils in the eye, visual acuity and equilibrium. The chronic recurrence of these physical reactions has been shown to cause fatigue, digestive disorders, heart disease, circulatory and equilibrium disorders. Moreover, noise is a causal factor in stress-related ailments such as ulcers, high blood pressure and anxiety.

Three harmful effects of noise which are commonly of concern include speech interference, the prevention or interruption of sleep, and hearing loss. Figure 3-2 illustrates how excessive background noises can reduce the amount and quality of verbal exchange and thereby impact education, family life-styles, occupational efficiency, and the quality of recreation and leisure time. Speech interference begins to occur at about 40 to 45 decibels and becomes severe at about 60 decibels. Background noise levels affect performance and learning processes through distraction, reduced accuracy, increased fatigue, annoyance and irritability, and the inability to concentrate (particularly when complex tasks are involved or in schools where younger children exhibit short concentration spans).

Several factors determine whether or not a particular noise event will interfere with or prevent sleep. These factors include the noise level and characteristics, the stage of sleep, the individual's age and motivation to waken. Ill or elderly people are particularly susceptible to noise-induced sleep interference, which can occur when intruding noise levels exceed the typical 35-45 decibel background noise level in bedrooms. Sleep prevention can occur when intruding noise levels exceed 50 dBA, as shown in Table 3-2.

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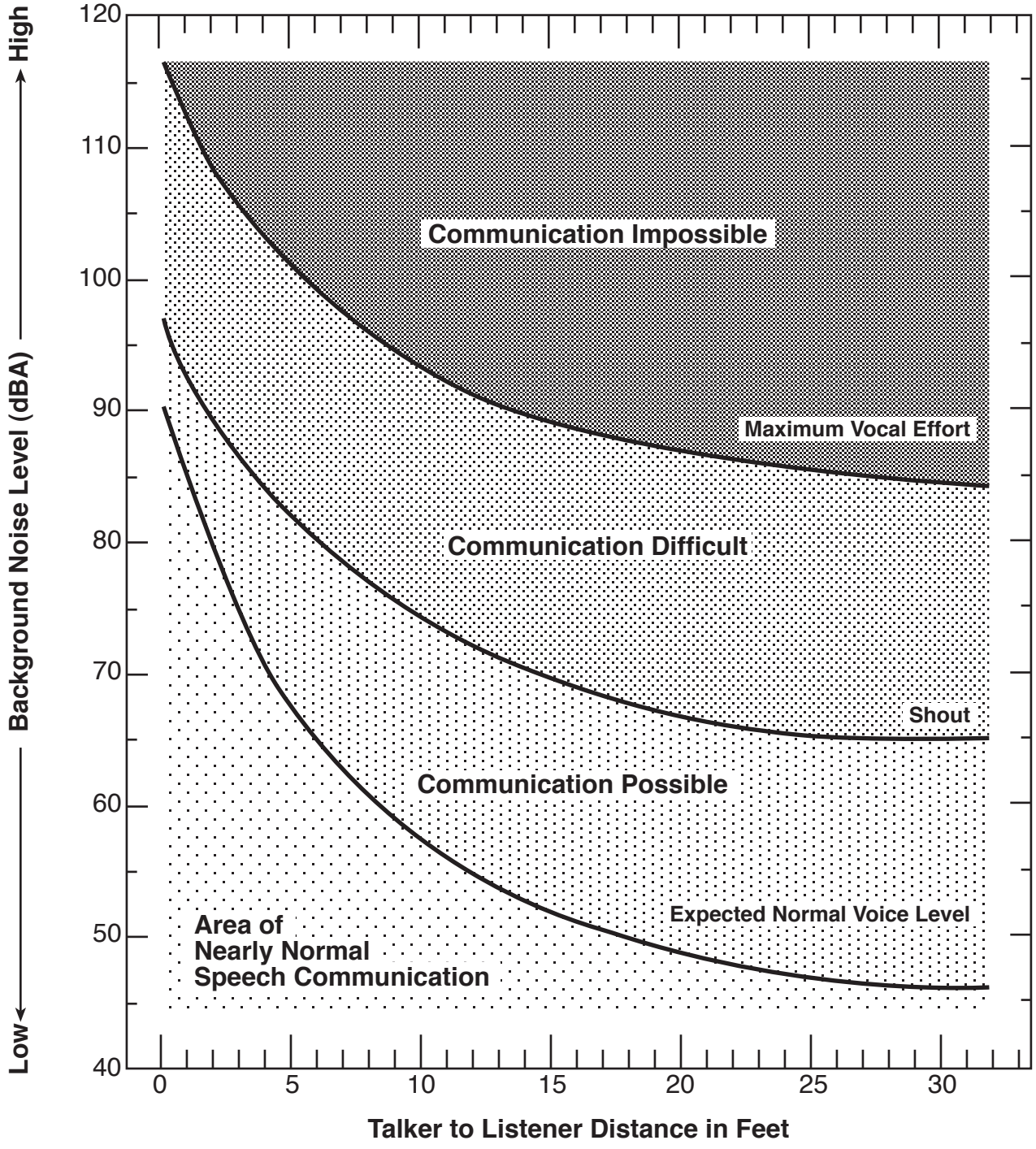
3. Conclusions drawn based upon computer modeling with RD-77-108, holding all variables constant except vehicle speed.

Figure 3-2

Speech Communication as a Function of Background Noise Level



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Source: Miller, "Effects of Noise on People", Journal of Acoustical Society of America, V.56, No. 3, 9/74

Table 3-2
Harmful Effects Of Noise[a]

Harmful Effect	Noise Levels at Which Harmful Effects Occur
Prevention or Interruption of Sleep	35 - 45 dB (A)
Speech Interference	50 - 60 dB (A)
Extra Auditory Physiological Effects	65 - 75 dB (A)
Hearing Loss	75 - 85 dB (A)

a. California Department of Public Health, *Report to 1971 Legislature*.

Hearing loss, like other adverse noise impacts, is related to a combination of noise amplitude and duration or exposure. Hearing loss may begin to occur at 75 dBA and is one of the most harmful effects of noise on people. Any noise greater than 85 dBA can damage hearing if the human ear is exposed to it over an extended period.

Traditionally, people have not been diagnosed with hearing loss until their 60s or later and hearing impairment has been viewed as a natural effect of aging. However, hearing loss from environmental noise exposure is developing at an earlier age than ever before. Many "baby boomers" are showing symptoms of hearing loss in their late 40s and 50s.

More than 28 million Americans currently have some degree of hearing loss (from mild to severe) and that number could reach 78 million by the year 2030, as baby boomers mature. One study estimates that as many as 5.2 million children in the United States, between the ages of 6 and 19, have some hearing damage from amplified music and other noise sources.[4] In many of these cases, exposures to very loud, impulsive, or sustained noises caused damage to the inner ear which was substantial even before a hearing loss was actually noticed.

Transportation noise levels experienced by communities and the general public are normally not high enough to produce hearing damage. The main causes of permanent damage are daily exposure to industrial noise. Although hearing loss can not be reversed, reducing exposure to excessive noise can prevent the damage from getting worse. To prevent the spread of hearing loss, a desirable goal would be to minimize the number of noise sources that expose people to sound levels above 70 decibels.

Even if an individual spends their life in a library, they will not hear as well at the age of seventy as they did when twenty years old. Hearing loss is a natural effect of the aging process.[5] Most common types of hearing loss occur at the higher frequencies. They are caused by damage to the sensitive hair cells essential for hearing that line the cochlea inside the inner ear. Once damaged, these cells are not regenerated. Various levels of noise affect these hair cells in different ways.

For example, if an explosion occurs right next to a person, the acoustic trauma kills hair cells in the ear and causes the instant loss of a great deal of hearing. Standing right in front of large speakers at a concert could cause a less serious temporary threshold shift in which

4. Mr. David Noonan, "A Little Bit Louder Please," *Newsweek,* June 6, 2005 Issue.
5. Dr. Robert Dobie, Professor of Otolaryngology, University of California, Davis.

the hair cells are stressed but not permanently damaged. This type of stress is often accompanied by ringing in the ears that can last for hours or even days after the event.

Repeated threshold shifts can lead to permanent hearing loss. Even if an individual's noise exposure does not reach levels that would cause instant hearing loss or temporary impairment at certain frequencies, constant exposure to noise in daily life may lead to deterioration over time. As the time during which the hair cells can rest decreases, they may become prematurely exhausted.

Protecting hearing requires an assessment of the risk of hearing loss and an understanding of the fact that the louder the noise, the less time people should be exposed to it. The risk of hearing loss is determined from the intensity of the sound (measured in decibels) multiplied by the duration of the sound (the exposure time). Prolonged exposure to any noise above 85 decibels can cause gradual hearing loss. For each five-decibel increase, the permissible exposure time is cut in half. Thus, one hour at 110 decibels is equivalent to eight hours at 95 decibels. Sound levels above 116 decibels (snowmobiles are 120 dB and rock concerts are 140 dB) are unsafe for any period of time.

With some exceptions (like weapons being fired next to ears) the development of adverse reactions to sound usually occurs over a long period of time. Therefore, adverse reactions are often evaluated in terms of the probability of the impact or the percent of the population affected. In noise exposure, as in other aspects of life, some level of risk is generally considered acceptable. Occupational Safety and Health Administration (OSHA) criteria that specify hearing protection in workplaces where noise levels exceed 90 dBA are based upon protecting only 80 percent of the population from hearing loss. Similarly, community annoyance criteria are frequently set at levels that allow up to a 15 percent probability of adverse reaction.

3.3 COMMUNITY RESPONSES TO SOUND

Many people must work and live in areas where noise exceeds acceptable levels. Construction and industrial noise sources frequently generate sound levels high enough to damage the hearing of nearby workers. These noise sources often provoke community annoyance complaints and are therefore the subject of noise control legislation at the federal, state, and local level.

People react to sound in different ways. They tend to compare an intruding noise with the existing background noise and usually find it objectionable if the new noise is: (1) readily identifiable, or (2) considerably louder than the ambient noise. Intermittent truck peak noise levels are more objectionable than continuous level fan noise. Humans are more sensitive to high frequency noise than low frequency noise.

The nature of the work or activity that is underway when the noise exposure occurs affects the way listeners react to the new noise. For example, workers in a factory or office may not be disturbed by highway traffic noise, but people sleeping at home or studying in a library and exposed to the same noise tend to be annoyed and find the noise objectionable. By the same token, an automobile horn at 2:00 a.m. is more disturbing than the same noise in traffic at 5:00 p.m.

Approximately 10 percent of the population has a very low tolerance for noise and will object to any noise not of their own making. Consequently, even in the quietest environment, some complaints will occur. Approximately 25 percent of the population will

not complain even in very severe noise environments.[6] Thus, a variety of reactions can be expected from people exposed to any given noise environment.

Despite this variability in behavior on an individual level, the population as a whole can be expected to exhibit the following responses to changes in noise levels. An increase or decrease of 1.0 dBA cannot be perceived except in carefully controlled laboratory experiments. A 3.0 dBA increase is considered just noticeable outside of the laboratory. An increase of 5.0 dBA is often necessary before any noticeable change in community response (i.e. complaints) would be expected.[7]

Community responses to noise may range from registering a complaint by telephone or letter, to initiating court action, depending upon each individual's susceptibility to noise and personal attitudes about noise. Several factors are related to the level of community annoyance including:

- fear associated with noise producing activities;
- socio-economic status and educational level of the receptor;
- noise receptor's perception that they are being unfairly treated;
- attitudes regarding the usefulness of the noise producing activity; and
- receptor's belief that the noise source can be controlled.[8]

Recent studies have shown that changes in long-term noise levels measured in units of day-night average sound levels (L_{dn}) or community noise equivalent levels (CNEL), are noticeable and are responded to by people. About ten percent of the people exposed to traffic noise of 60 L_{dn} will report being highly annoyed with the noise, and each increase of one L_{dn} is associated with approximately two percent more people being highly annoyed. When traffic noise exceeds 60 L_{dn} or aircraft noise exceeds 55 L_{dn}, people begin complaining.[9] Group or legal actions to stop the noise should be expected to begin at traffic noise levels near 70 L_{dn} and aircraft noise levels near 65 L_{dn}.

3.4 LAND USE COMPATIBILITY WITH NOISE

Some land uses are more tolerant of noise than others. Schools, hospitals, churches and residences are more sensitive to noise intrusion than commercial or industrial activities. As ambient noise levels affect the perceived amenity or livability of a development, so too can the mismanagement of noise impacts impair the economic health and growth potential of a community by reducing the desirability of the area as a place to live, shop and work. For this reason, land use compatibility with the noise environment is an important consideration in the planning process.

The annoyance-based research by the federal Environmental Protection Agency prescribes an average 24-hour noise level of 55 dBA as the goal for exterior noise levels in residential areas, with 75 dBA identified as the absolute upper limit of acceptability. Table 3-3 summarizes the EPA findings with regard to: (1) the effects of various noise levels on residential communities (in terms of hearing loss, speech interference and annoyance); (2) the general community attitude toward the area; and (3) the average community reaction to different noise exposure levels.

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6. Bolt Beranek & Newman, *Literature Survey for the FHA Contract on Urban Noise*, Report No. 1460, January 1967.
7. State of California, Department of Transportation, *Noise Manual*, 1980 and Highway Research Board, *National Cooperative Highway Research Program Report 117*, 1971.
8. United States Environmental Protection Agency, *Public Health and Welfare Criteria For Noise*, July 1973.
9. State of California, Department of Health Services, Dr. Jerome Lukas, Memo dated July 11, 1984.

Table 3-3

Effects of Noise on People
(Residential Land Uses Only)

Effects[1] / Day-Night Average Sound Level in Decibles	Hearing Loss	Speech Interference		Annoyance[2]	Average Community Reaction[4]	General Community Attitude Toward Area
		Indoor	Outdoor			
	Qualitative Description	% Sentence Intelligibility	Distance in Meters for 95% Sentence Intelligibility	% of Population Highly Annoyed[3]		
75 and above	May Begin to Occur	98%	0.5	37%	Very Severe	Noise is likely to be the most important of all adverse aspects of the community environment.
70	Will Not Likely Occur	99%	0.9	25%	Severe	Noise is one of the most important adverse aspects of the community environment.
65	Will Not Occur	100%	1.5	15%	Significant	Noise is one of the important adverse aspects of the community environment.
60	Will Not Occur	100%	2.0	9%	Moderate to Slight	Noise may be considered an adverse aspect of the community environment.
55 and below	Will Not Occur	100%	3.5	4%		Noise is considered no more important than various other environmental factors.

1. "Speech Interference" data are drawn from the following tables in EPA's "Levels Document:" Table 3, Fig. D-1, Fig. D-2, Fig. D-3. All other data from National Academy of Science report "Guidelines for Preparing Environmental Impact Statements on Noise, Report of Working Group 69 on Evaluation of Environmental Impact of Noise" (1977).

2. Depends on attitudes and other factors.

3. The percentages of people reporting annoyance to lesser extents are higher in each case. An unknown small percentage of people will report being "highly annoyed" even in the quietest surroundings. One reason is the difficulty all people have in integrating annoyance over a very long time.

4. Attitudes or other non-acoustic factors can modify this. Noise at low levels can still be an important problem, particularly when it intrudes into a quiet environment.

Note: Research implicates noise as a factor producing stress-related health effects such as heart disease, high blood pressure and stroke, ulcers and other digestive disorders. The relationships between noise and these effects, however have not as yet been conclusively demonstrated.

Source: U.S. Department of Transportation "Guidelines for Considering Noise in Land Use Planning and Control", 1980

Interference with activity and annoyance will not occur if outdoor levels are maintained at an energy equivalent of 55 dB and indoor levels are at or below 45 dB. While these levels are relevant for planning and design, they are not land use planning criteria because they do not consider economic cost, technical feasibility or the development needs of the community.

Palm Springs General Plan Standards and Policies

Noise concerns must be incorporated in land use planning to reduce the potential for future noise/land use incompatibilities within the City of Palm Springs. The City has adopted standards and criteria that specify acceptable limits of noise for various land uses to prevent noise/land use conflicts. The City reduces the impact of transportation noise in the community through the construction of noise barriers and by site design review. The impacts of non-transportation noises are effectively controlled through the enforcement and application of the City's Noise Ordinance.

Land Use Compatibility With Noise

Goals and policies regarding land use compatibility with noise are identified in the Noise Element of the *Palm Springs 2007 General Plan*. The goal of the Noise Element is to protect residential areas and other sensitive land uses from impacts generated by exposure to excessive noise levels, by minimizing to the greatest extent possible, noise impacts associated with stationary, mobile and temporary noise sources. The Noise Element identifies numerous policies and actions designed to achieve these goals.

The Noise Element contains guidelines for land use compatibility with various community noise exposure levels to permit noise concerns to be incorporated in the land use planning process and prevent future noise incompatibilities. As shown in Figure 3-3, community noise levels are identified as "normally acceptable", "conditionally acceptable", "normally unacceptable", or "clearly unacceptable" for each land use category. A "normally acceptable" designation indicates that conventional construction can occur with no special noise reduction requirements. A "conditionally acceptable" designation implies that new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements for each land use type is made and needed noise insulation features are incorporated in the design.

If development is to proceed where a "normally unacceptable" designation would apply, the outdoor areas must be shielded and a detailed analysis of the noise reduction requirements must be undertaken to identify design features required to achieve acceptable indoor noise levels. New development should generally not be undertaken if the community noise levels would result in a "clearly unacceptable" designation.

As shown in Figure 3-3, offices, businesses, commercial uses, playgrounds and neighborhood parks are considered "normally acceptable" in areas where the exterior noise exposure does not exceed 70 CNEL. Low-density residential uses are considered "normally acceptable" where the community noise exposure level is 60 CNEL or less and "conditionally acceptable" where the CNEL is between 55 and 70 dBA. Industrial, manufacturing, and utilities are "normally acceptable" at a CNEL up to 75 dBA and "conditionally acceptable" in areas where noise levels are 70 to 80 CNEL.

To protect citizens from the harmful and annoying effects of exposure to excessive noise, the City of Palm Springs has adopted specific interior and exterior noise standards related to various land uses in the Noise Element of the *Palm Springs 2007 General Plan*. Table 3-4 presents the City policies regarding interior and exterior noise standards by land use category.

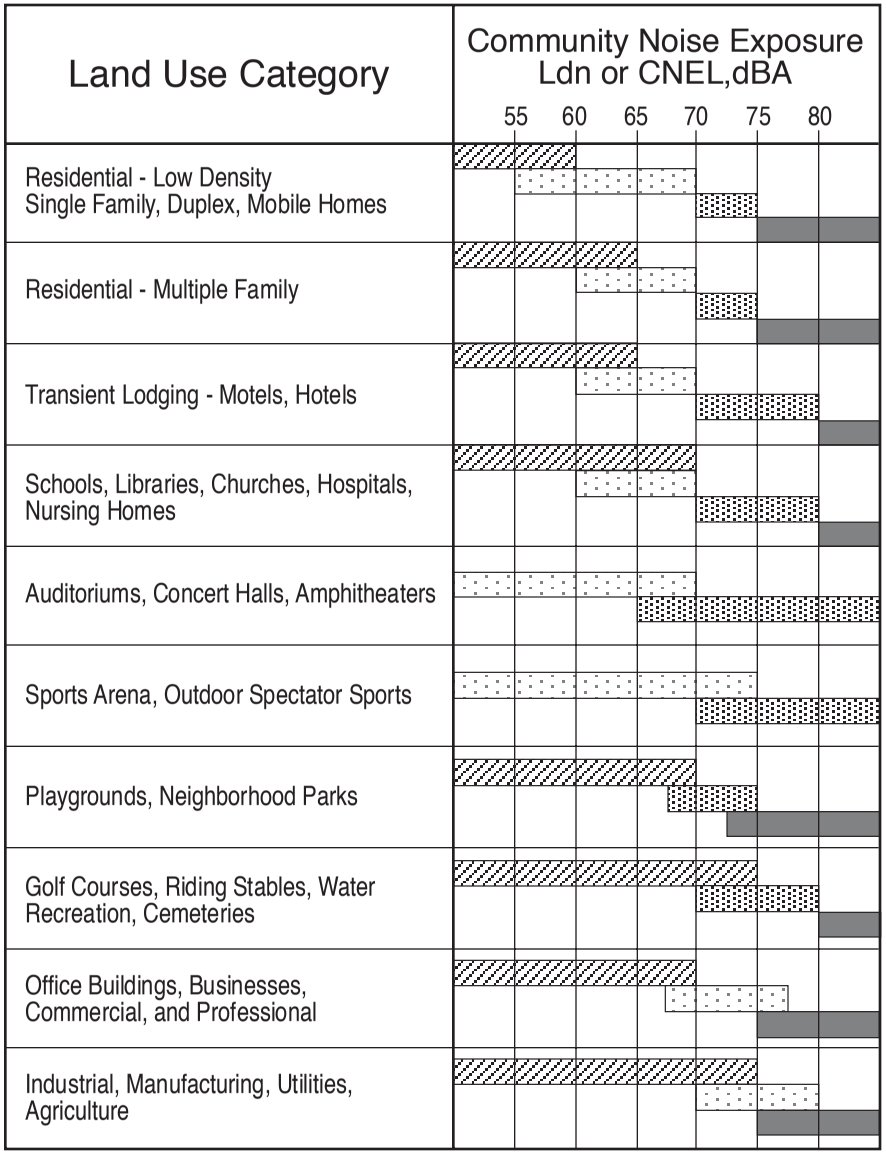

Figure 3-3
Land Use Compatibility for Community Noise Exposure

Interpretation

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 requirements is made and needed noise reduction 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 develoment 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.

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Source: "Palm Springs 2007 General Plan," Adopted October 24, 2007.

Table 3-4
City of Palm Springs Interior and Exterior Noise Standards[a]

Land Use		CNEL (dBA)	
Categories	Uses	Interior[b]	Exterior[c]
Residential	Single-Family, Multiple-Family, Duplex	45[d]	65
	Mobile Homes	--	65[e]
Commercial	Hotel, Motel, Transient Housing	45	--
	Commercial Retail, Bank, Restaurant	55	--
	Office Building, Research and Development, Professional Offices	50	--
	Amphitheater, Concert Hall, Auditorium, Meeting Hall	45	--
	Gymnasium (Multipurpose)	50	--
	Sports Club	55	--
	Manufacturing, Warehousing, Wholesale, Utilities	65	--
	Movie Theaters	45	--
Institutional/ Public	Hospital, School, Classrooms/Playgrounds	45	65
	Church, Library	45	--
Open Space	Parks	--	65

a. Noise Element of the *Palm Springs 2007 General Plan*, Adopted October 24, 2007, pg. 8-8, based on the California Office of Planning and Research "General Plan Guidelines," 2003.
b. Indoor environment excluding bathrooms, kitchens, toilets, closets, and corridors.
c. The exterior noise levels are to be attained in habitable areas and need not encompass the entire property. Habitable areas are dwellings areas that are occupied, intended or designed to be occupied, with facilities for living, sleeping, cooking and eating. The outdoor environment is limited to: private yard of single-family dwellings; multiple-family private patios or balconies accessed from within the dwelling (balconies 6 feet deep or less are exempt); mobile home parks; park picnic areas; school playgrounds; and hospital patios.
d. Noise-level requirement with closed windows, mechanical ventilation, or other means of natural ventilation shall be provided per Chapter 12, Section 1205 of the *Uniform Building Code*.
e. Exterior noise levels should be such that interior noise levels will not exceed 45 dBA CNEL.

As shown in Table 3-4, the exterior noise standard is 65 CNEL for parks, residential development, hospitals, school classrooms and playgrounds. There is no exterior noise standard for manufacturing, warehousing, or industrial uses. There is no exterior noise standard for offices or commercial/retail development.

Exterior noise levels apply to outdoor areas which have regular human use and in which a lowered noise level would be beneficial. They need not be applied to the entire property, to areas having limited human use, or where lowered noise levels would produce little benefit. Outdoor environments are generally limited to private yards of single-family residences, private patios or balconies of multi-family residences, mobile home parks, picnic areas at parks, and school playgrounds.

An interior noise standard of 45 CNEL applies to single-family and multiple-family residential development. Interior noise standards relate to indoor activity areas where no exterior noise-sensitive land use or activity is identified. Interior noise standards typically apply to indoor environments excluding bathrooms, kitchen areas, closets and corridors.

City Noise Goals and Policies

The City of Palm Springs has adopted numerous noise policies designed to achieve the City's noise goals. The following City noise goals are set forth in the Noise Element of the *Palm Springs 2007 General Plan*.

- Protect residential areas and other sensitive land uses from impacts generated by exposure to excessive noise.
- Minimize, to the greatest extent possible, the impact of transportation-related noise on residential areas and other sensitive land uses.
- Minimize, to the greatest extent possible, the impact of non-transportation-related stationary and temporary noise on residential areas and other sensitive land uses.

The following noise policies identified in the *Palm Springs 2007 General Plan* may be relevant to the proposed project.

Policy NS1.1 Continue to enforce acceptable noise standards consistent with health and quality of life goals established by the City and employ noise abatement measures, including the noise ordinance, applicable building codes, and subdivision and zoning regulations.

Policy NS1.2 Encourage the application of site planning and architectural design techniques that reduce noise impacts on proposed and existing projects.

Policy NS1.3 Utilize maximum anticipated, or "worst case," noise conditions as the basis for land use decisions and design controls as a means of preventing future incompatibilities.

Policy NS1.4 Evaluate the compatibility of proposed land uses with the existing noise environment when preparing, revising, or reviewing development proposals.

Policy NS1.5 Protect noise-sensitive land uses such as schools, hospitals, and convalescent homes from unacceptable noise levels from both existing and future noise sources.

Policy NS1.6 Require mitigation where sensitive uses are to be placed along transportation routes to ensure compliance with state noise standards.

Policy NS1.7 Allow new developments in areas exposed to noise levels greater than 60 dB CNEL only if appropriate mitigation measures are included such that applicable noise standards are met.

Policy NS 1.8 Include measures within project design that will assure that adequate interior noise levels are attained as required by the California Building Standards Code (Title 24), California Noise Insulation Standards (*Title 25*) and pertinent sections of the California Building Code and the City's Municipal Code.

Policy NS 1.9 Develop joint agreements with adjacent jurisdictions to apply standardized zoning and soundproofing requirements to reduce noise incompatibilities across jurisdictional boundaries.

Policy NS1.11 Encourage public agencies and institutions located in the City to incorporate appropriate measures to contain noise generated by their activities on-site.

Policy NS2.1 Require noise-attenuating project design or sound barriers to reduce the level of traffic-generated noise on residential and other noise-sensitive land uses to acceptable levels.

Policy NS2.2 Use traffic calming measures to reduce vehicular speeds and noise levels in residential neighborhoods.

Policy NS2.4 Require that new development minimize the noise impacts of trips it generates on residential neighborhoods by locating driveways and parking away from the habitable portions of dwellings to the greatest extent possible.

Policy NS2.5 Require that development generating increased traffic and subsequent increases in the ambient noise levels adjacent to noise-sensitive land uses provide appropriate mitigation to reduce the impact of noise.

Policy NS2.6 Employ noise-mitigation practices, such as natural buffers or setbacks between arterial roadways and noise-sensitive areas, when designing future streets and highways, and when improvements occur along existing road segments.

Policy NS2.7 Maintain roadways so that the paving is in good condition to reduce noise-generating cracks, bumps, and potholes.

Policy NS2.10 Require new equipment and vehicles purchased by the City to comply with noise-performance standards consistent with the best available noise-reduction technology.

Policy NS 2.12 Work with local agencies to provide public transit services that reduce traffic and noise and to ensure that the equipment they use does not generate excessive noise levels.

Policy NS 2.13 Encourage the Union Pacific railroad to minimize the level of noise produced by train movements and whistle noise within the City by reducing the number of nighttime operations, improving vehicle system technology and constructing new or developing improved sound barriers where residences exist next to the track.

Policy NS 2.14 Review and evaluate the City's traffic-flow systems to synchronize signalization to avoid traffic stops, which produce excessive noise.

Policy NS 2.15 Locate land uses that are compatible with higher noise levels adjacent to major roads and railway corridors.

Policy NS2.16 Restrict truck access in the City to approved truck routes and review hours of access to maximize residential and commercial activities free of truck traffic.

Policy NS2.17 Restrict early-morning trash pickup to less-sensitive land use areas where possible and rotate early morning pickup areas where restrictions are not possible.

NS2.23 Work with the federal government to incorporate helicopter routes on the "VFR (Visual Flight Rules) Aeronautical Chart" that align with the City's commercial corridors, such as Palm Canyon and Indian Canyon Drives.

NS2.24 Maximum compatibility between aircraft operations at Palm Springs International Airport and noise-sensitive land uses within the environs of the airport shall be achieved through compliance with the Noise Compatibility Plan of the FAR Part 150 Noise Compatibility Study.

Policy NS2.25 Encourage and facilitate the development of alternative transportation modes that minimize noise within residential areas such as bicycle and pedestrian pathways.

Policy NS3.3 Require that parking lots and structures be designed to minimize noise impacts on-site and on adjacent uses, including the use of materials that mitigate sound transmissions and configuration of interior spaces to minimize sound amplification and transmission.

Policy NS3.10 Require that construction activities that impact adjacent residential units comply with the hours of operation and noise levels identified in the City Noise Ordinances.

Policy NS3.11 Require that construction activities incorporate feasible and practical techniques which minimize the noise impacts on adjacent uses, such as the use of mufflers and intake silencers no less effective than originally equipped.

Policy NS3.12 Encourage the use of portable noise barriers for heavy equipment operations performed within 100 feet of existing residences, or make applicants provide evidence as to why the use of such barriers is not feasible.

Policy NS3.15 Work with public agencies and institutions that maintain facilities in the City to ensure that noise generated by their activities is limited to their site. Appropriate mitigation measures such as physical enclosures and time restrictions for operation shall be implemented.

Policy NS3.16 Allow for deviations from the noise standards for projects that are considered to be of significant importance (municipal revenue, socially valued, etc.) or contribute significant benefits to the City, provided that:

- The impacts can be mitigated by an acceptable compensating mechanism; and
- The impacts shall be reviewed with public hearings by the community and approved by the Planning Commission and City Council in conjunction with a Planned Development District.

Policy NS3.17 Promote the use of solar energy generation systems to reduce noise impacts on the community.

Palm Springs Municipal Code Requirements

The Palm Springs Noise Ordinance (Chapter 11.74) was designed to protect quiet residential areas throughout the City of Palm Springs from non-transportation noise sources. The noise levels encouraged by the Noise Ordinance are typical of a quiet residential area. The Noise Ordinance specifies adopted maximum permissible sound levels by receiving land use and maximum permissible dwelling interior sound levels. These noise control standards apply to non-transportation noise sources and are in addition to the interior and exterior noise standards specified in the Noise Element of the *Palm Springs 2007 General Plan*.

No person shall operate or cause to be operated any source of sound at any location which causes the noise level when measured on any other property to exceed the limits identified in Sections 11.74.031 and 11.74.032, as outlined below. However, if the measurement location is on a boundary between two different zones, the noise level limit applicable to the lower noise zone plus five decibels shall apply.

The Palm Springs Noise Ordinance sets noise level limits in low density residential areas adjacent to industrial areas of 55 dBA (between 7:00 a.m. and 6:00 p.m.), 50 dBA (between 6:00 p.m. and 10:00 p.m.), and 45 dBA (between 10:00 p.m. and 7:00 a.m.). These noise level limits may not be exceeded by five decibels or more at the residential property line, with allowances for time duration of the sound during the daytime hours. The time duration of sound allowances include: +3 dBA for up to 30 minutes per hour, +6 dBA for up to 15 minutes per hour, +8 dBA for up to 10 minutes per hour, +11 dBA for up to 5 minutes per hour, +15 dBA for up to 2 minutes per hour, +18 dBA for up to 1 minute per hour, +21 dBA for up to 30 seconds per hour, and +24 dBA for up to 15 seconds per hour.

The Construction Site Regulations (Chapter 8.04.220) limit construction work to the hours of 7:00 a.m. and 7:00 p.m. on weekdays and 8:00 a.m. and 5:00 p.m. on Saturdays, if the noise produced is of such intensity or quality that it disturbs the peace and quiet of any other person of normal sensitivity. Construction work is not permitted on Sundays and six major holidays, when residents are more likely to be home.

3.5 CURRENT NOISE EXPOSURE

The primary sources of noise in the study area are transportation related. Master planned roadways accommodate passenger cars, trucks, buses and motorcycles that increase ambient noise levels within the study area. The Palm Springs International Airport generates aircraft over flights. Railroad lines pass through the City of Palm Springs north of the project site within the Union Pacific Railroad corridor located south of Interstate 10.

The CNEL noise metric allows the total noise exposure of an area resulting from many individual noise events over a long period of time to be summed and expressed as a single value and mapped as a series of contour lines around the noise source. CNEL values represent the accumulation of noise energy in a manner similar to the way a rain gauge accumulates precipitation from passing storm fronts. Whether the noise event is brief and intense or occurs over an extended period at lower levels, the total noise energy at a location is summed to determine the exposure over a specified interval.

In the case of highway noise, CNEL values typically reflect the noise exposure over an average 24-hour period. CNEL values can reflect the noise exposure over the peak activity period or over a year, as is often the case with airport contours. In either case, they reflect the weighted summation of all of the sound events at a designated location, whether the events are far away with minimal effect or nearby, creating the dominant noise exposure at that location.

With the CNEL metric, sound events that occur during the evening hours are given a 5 dB penalty while those that occur at night are given a 10 dB penalty, to reflect the sensitivity of noise-sensitive receptors to sound events during these periods. This assumes that one evening noise event is equal in impact to three similar daytime events. It also assumes that one nighttime sound event is equal in impact to ten equivalent daytime sound events.

Aircraft Noise

The Palm Springs International Airport generates aircraft over flights that are audible and affect the current noise exposure of the project site and the study area. At its closest point, the end of the runway at the Palm Springs International Airport is located approximately 4,325 feet south of the southern boundary of the South Village. The maximum noise exposure considered acceptable for new residential land uses in the environs of the Palm Springs International Airport is 62 dB CNEL. The *Riverside County Airport Land Use Compatibility Plan* recommends that dwellings incorporate special noise attenuation measures in their design, if required, to ensure that interior noise levels do not exceed 45 dB CNEL.

The *Palm Springs 2007 General Plan* includes airport noise contours that represent a composite of year 2002 and year 2020 noise levels derived from the *Palm Springs International Airport Master Plan Study* (May 2003). As shown in Figure 3-4, at its closest point, the southwest corner of the South Village is located approximately 700 feet outside of the 60 dB CNEL contour and 2,090 feet outside of the 65 dB CNEL contour associated with the Palm Springs International Airport.[10]

Railroad Noise

The Union Pacific rail corridor is located north of the study area, along the south side of Interstate 10. Pursuant to the Noise Control Act, the Environmental Protection Agency regulates railroad noise and sets operating noise standards for railroad equipment. Figure 8-4 of the *Palm Springs 2007 General Plan* identifies the 65 CNEL railroad noise contour as being located approximately 900 feet on either side of the Union Pacific railroad tracks. None of the urbanized portions of the City of Palm Springs are currently located within close proximity to the railroad corridor. The northern boundary of the North Village is located approximately 6,540 feet south of the Union Pacific Railroad corridor. Therefore, although the noise generated by railroad activities may be audible within the project site, it does not pose a significant constraint to noise-sensitive development.

Motor Vehicle Noise

The closest residence proposed within the project site would be located approximately 7,930 feet southwest of the Interstate 10 freeway, behind the Whitewater River channel levee. Figure 8-4 of the *Palm Springs 2007 General Plan* identifies the 60 CNEL noise contour generated by vehicles on Interstate 10, between Gene Autry Trail and Indian Canyon Drive, as being located approximately 3,830 feet from the centerline of Interstate 10. The 65 CNEL contour is located approximately 1,830 feet from the centerline of Interstate 10 in this area. Consequently, the noise generated by traffic on the Interstate 10 freeway may be audible within the site at times but does not pose a significant constraint to noise-sensitive development within the project site.

The closest master planned roadways to the project site are: Sunrise Way, San Rafael Drive, Whitewater Club Drive, Verona Road, and the future extension of Sunrise Parkway. Based upon the future roadway noise contours shown in the *Palm Springs 2007 General Plan Noise Element* none of the 60 CNEL or 65 CNEL contours associated with these master planned roadways extend into the project site.

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10. *Palm Springs 2007 General Plan* (Figure 8-6) based upon the year 2002 and 2020 contours in the *Palm Springs International Airport Master Plan Study* (May, 2003).

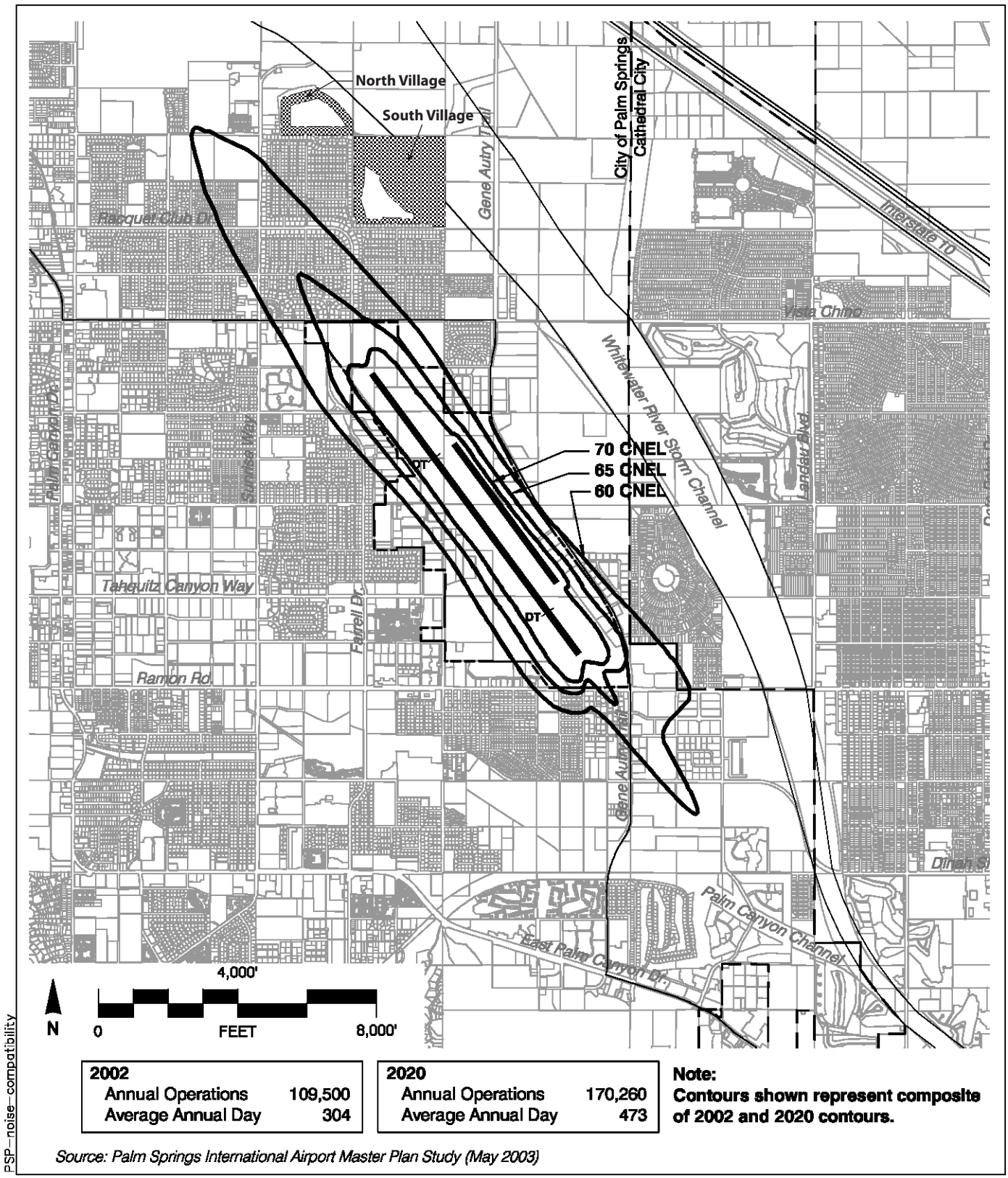

Figure 3-4
Palm Springs International Airport
Noise Compatibility Contours

Noise from motor vehicles is generated by engine vibrations, the interaction between the tires and the road, and the exhaust system. Consequently, reducing the speed of motor vehicles reduces the noise exposure of listeners both inside the vehicle and adjacent to the roadway. The Federal Highway Traffic Noise Prediction Model (RD-77-108) developed by the Federal Highway Administration was used to evaluate existing highway noise conditions near the project site. The FHWA highway traffic noise prediction model is based upon reference energy emission levels for automobiles, medium trucks (2 axles) and heavy trucks (3 or more axles). The California Vehicle Noise (Calveno) Reference Energy Mean Emission level curves were used, as recommended by Caltrans, to accurately model the noise levels within the study area.

This noise model accepts various parameters including the traffic volume, vehicle mix and speed, and roadway geometry, in computing equivalent noise levels during typical daytime, evening, and nighttime hours. The resultant noise levels are then weighted, summed over 24 hours, and output as the CNEL value. The model assumes that the noise receptor has a clear unobstructed line-of-sight exposure to the traffic on the roadway, with no barrier or other shielding at the receiver location. The noise contours assume flat terrain, without barrier interference or field-of-view restrictions (like intervening buildings or landscaping).

Noise contours are lines of constant sound level. Various CNEL contours were located through a series of computerized iterations designed to isolate the 60, 65, and 70 CNEL contour locations. The CNEL values include adjustments during the evening and night to compensate for the heightened sensitivity of the average listener during these hours.

The traffic data used for the noise modeling was taken from the *Traffic Impact Study For Tentative Tract Map No. 36691* (Endo Engineering; February 10, 2014). An eight percent truck mix was assumed for the noise modeling of all major thoroughfares and Sunrise Parkway. The truck mix specified by Riverside County for noise analyses (2.58 percent trucks) was assumed for the secondary thoroughfares and collector streets.[11] To ensure a conservative analysis, all sites were considered "hard" rather than "soft" so that noise levels would be atmospherically attenuated by geometric spreading of the sound energy at a rate of 3.0 dBA with each doubling of distance.

Table 3-5 provides the current noise levels adjacent to roadways within the study area. The distances to various noise contours used for land use compatibility purposes are also shown therein. As shown therein, the ambient noise levels emanating from area roadways currently range from a low of 52.9 CNEL at 50 feet from the centerline of Via Escuela, east of Gene Autry Trail, to a high of 79.8 CNEL at 50 feet from the centerline of Vista Chino, east of Farrell Drive.

The 70 dBA contour presently falls within the right-of-way along sixteen of the thirty-eight (42 percent) roadway segments analyzed. The 65 CNEL contour is located within the right-of-way along thirteen of the roadway segments analyzed (34 percent). The 60 CNEL contour is located within the right-of-way along five of the roadway segments evaluated (13 percent).

Table 3-6 identifies the number of roadway segments within the study area that generate noise levels at a distance of fifty feet from their centerline within a variety of noise level ranges. In addition, the percentage of the roadways modeled that was found to fall within each range of noise levels is shown in Table 3-6.

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11. Riverside County Department of Health, Memorandum Regarding Requirements for Determining and Mitigating Traffic Noise Impacts to Residential Structures. (January 15, 2004).

Table 3-5
Existing Exterior Noise Exposure Adjacent to Area Roadways

Roadway	A.D.T.[a] (Veh./Day)	CNEL[b] @ 50 Feet	Distance to Contours (Ft.)[c] 70 dBA	65 dBA	60 dBA
Sunrise Way					
- North of San Rafael Drive	3,970	69.4	R/W	123	383
- South of San Rafael Drive	9,890	73.4	99	304	960
- North of Racquet Club Road	11,080	73.9	110	341	1,077
- South of Racquet Club Road	10,220	73.5	101	311	982
- North of Via Escuela	10,610	73.7	106	326	1,029
- South of Via Escuela	12,460	74.4	123	383	1,208
- North of Vista Chino	14,030	74.9	138	429	1,356
- South of Vista Chino	19,850	76.4	193	606	1,915
Farrell Drive					
- North of Racquet Club Road	1,600	56.9	R/W	R/W	R/W
- South of Racquet Club Road	10,770	73.5	106	331	1,044
- North of Via Escuela	10,650	73.5	106	331	1,044
- South of Via Escuela	10,800	73.5	106	331	1,044
- North of Vista Chino	10,930	73.6	108	338	1,069
- South of Vista Chino	15,380	75.0	149	467	1,475
Whitewater Club Drive					
- North of Via Escuela	1,250	55.8	R/W	R/W	R/W
- South of Via Escuela	860	54.2	R/W	R/W	R/W
- North of Vista Chino	980	54.7	R/W	R/W	R/W
Gene Autry Trail					
- North of Via Escuela	30,640	79.7	410	1,295	4,094
- South of Via Escuela	29,490	79.5	392	1,236	3,909
San Rafael Drive					
- West of Sunrise Way	6,910	67.9	R/W	93	288
- East of Sunrise Way	1,650	57.0	R/W	R/W	R/W
Racquet Club Road					
- West of Sunrise Way	7,910	68.5	R/W	106	331
- East of Sunrise Way	9,490	69.3	44	127	397
- West of Farrell Drive	9,830	69.5	45	133	416
Via Escuela					
- West of Sunrise Way	2,470	58.8	R/W	R/W	38
- East of Sunrise Way	2,110	58.1	R/W	R/W	33
- West of Farrell Drive	2,170	58.2	R/W	R/W	33
- East of Farrell Drive	4,380	61.3	R/W	R/W	67
- West of Whitewater Club Dr.	3,920	60.8	R/W	R/W	60
- East of Whitewater Club Dr.	5,380	62.2	R/W	R/W	83
- West of Gene Autry Trail	4,790	61.6	R/W	R/W	72
- East of Gene Autry Trail	640	52.9	R/W	R/W	R/W

a. A.D.T. = Year 2013 peak season average daily two-way traffic volume.
b. CNEL values are given at 50 feet from the roadway centerline (see Appendix B for model assumptions).
c. All distances are measured from the centerline. R/W means the contour falls within the street right-of-way.

Table 3-5
Existing Exterior Noise Exposure Adjacent to Area Roadways

Roadway	A.D.T.[a] (Veh./Day)	CNEL[b] @ 50 Feet	Distance to Contours (Ft.)[c] 70 dBA	65 dBA	60 dBA
Vista Chino					
- West of Sunrise Way	19,460	76.7	189	592	1,871
- East of Sunrise Way	21,490	77.2	212	665	2,099
- West of Farrell Drive	23,450	77.5	227	712	2,250
- East of Farrell Drive	33,620	79.8	383	1,208	3,820
- West of Whitewater Club Dr.	33,260	79.4	383	1,208	3,820
- East of Whitewater Club Dr.	33,210	79.4	383	1,208	3,820

a. A.D.T. = Year 2013 peak season average daily two-way traffic volume.
b. CNEL values are given at 50 feet from the roadway centerline (see Appendix B for noise model input parameter assumptions).
c. All distances are measured from the centerline. R/W means the contour falls within the street right-of-way.

Table 3-6
Area Roadway Segments Currently Generating Noise Levels
At Fifty Feet Within Various CNEL Ranges

Noise Exposure Range At 50 Feet From Centerline	Number of Roadway Segments In Range	Percentage of Roadway Segments Within Range
≤ 60 CNEL	9	23.7
60.1-65.0 CNEL	4	10.5
65.1-70.0 CNEL	5	13.2
70.1-75.0 CNEL	11	28.9
75.1-80.0 CNEL	9	23.7

As shown in Table 3-6, 23.7 percent of the roadways modeled currently generate noise levels that exceed 75 CNEL at a point located 50 feet from their centerline. These roadway segments are along Vista Chino, Gene Autry Trail, Sunrise Way and Farrell Drive. Thirteen percent of the roadway segments modeled generate noise levels between 65 and 70 CNEL. Twenty-four percent of the roadway segments modeled generate noise levels below 65 CNEL. Twenty-nine percent of the roadway segments modeled generate noise levels between 70 and 75 CNEL.

Noise Generated By Development Adjacent to the Project Site

Non-transportation noise levels currently within the project site are typical of urbanized areas and include sounds associated with the residents of the surrounding residential land uses. The residential dwelling units that currently surround the project site generate

relatively little noise, other than that associated with motor vehicles arriving and departing, dogs barking, and landscaping equipment (lawnmowers, edgers, and blowers).

3.6 NOISE SENSITIVE RECEPTORS

Areas identified as "noise sensitive" must be protected from excess noise to maintain the City's quality of life. Noise sensitive land uses identified in the *Palm Springs 2007 General Plan* Noise Element include: residential land uses, hospitals, rest homes and convalescent hospitals, churches and schools. The Four Seasons at Palm Springs residential community surrounds the North Village on three sides. The Golden Sands Mobile Home Park is surrounded on all sides by the North Village. The South Village surrounds the Alexander Estates residential community on all sides.

Land uses considered to be relatively insensitive to noise typically include business, commercial, and professional developments. Land uses which are considered to not be sensitive to noise typically include: industrial uses, manufacturing uses, utilities, agriculture, natural open space, undeveloped land, parking lots, motorcycle parks, rifle ranges, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

Existing Land Uses Within the Project Site

The project site is located south of the Whitewater River/Chino Creek flood control levee maintained by the Riverside County Flood Control District to protect the area from 100-year floods. The project site was previously developed as the Palm Springs Country Club Golf Course and associated clubhouse but is currently vacant and generates no noise.

Land Uses Surrounding The Project Site

One of the surrounding developments with land uses deemed noise-sensitive is the Avalon P.D.D. residential community. Construction of this development was initiated east of Indian Canyon Drive, between Sunrise Parkway and San Rafael Drive, then halted as a result of the economic recession. This area is expected to ultimately be developed as single-family residential lots and a golf course. In conjunction with this development, Sunrise Parkway will be extended from Sunrise Way north and then west to Indian Canyon Drive.

The Whitewater River channel and flood control levee are located north and east of the project site. The area immediately south of the North Village and west of the South Village is primarily developed with single-family residential land uses in the Desert Park Estates development.

Two schools are located west of the study area. The Raymond Cree Middle School is located at 1011 East Vista Chino. This school is located south of Vista Chino and west of Sunrise Way and the study area. The Vista Del Monte Elementary School is located west of Sunrise Way and the study area, between San Rafael Drive and Racquet Club Road at 2744 North Via Miraleste.

4.0 NOISE IMPACT ANALYSIS

4.1 SIGNIFICANCE THRESHOLDS

Since noise increases or decreases of 1.0 dBA cannot be perceived (except in carefully controlled laboratory experiments) project-related noise impacts of this magnitude are not considered to be significant. If a project-related change in noise levels exceeds 3.0 dBA, it is considered to be audible and "potentially significant," provided noise-sensitive receptors are present. If a project-related noise increase exceeds 3.0 dBA and a receiving land use is expected to exceed the noise standards detailed in the Noise Element of the *Palm Springs 2007 General Plan* as a result, the noise impact is considered "clearly significant" and warrants the development of appropriate mitigation strategies.

4.2 SHORT-TERM CONSTRUCTION-RELATED IMPACTS

Short-term acoustic impacts are those associated with the construction activities necessary to implement the proposed project. Construction activities will create short-term noise increases that may be noticeable to residents of the community surrounding the site when:

- demolition of the remaining clubhouse foundation, tennis courts, and parking lots occurs within the southeast corner of the South Village;
- the demolition debris is loaded onto trucks and hauled to the landfill;
- construction vehicles associated with workers, building materials, and construction equipment enter and leave the site;
- activities occur in construction staging areas;
- temporary on-site generators are operated;
- fine grading activities are under way;
- construction of the buildings is occurring; and
- paving activities occur to provide site access and internal streets.

Short-term construction noise levels will be higher than the ambient noise levels in the study area today, but will subside once the construction activities are completed. Two types of noise impacts should be considered during the construction phase: (1) transportation-related noise impacts, and (2) construction activity noise impacts.

Transportation-Related Construction Noise Increases

The transport of workers, construction equipment, demolition debris, and building materials will incrementally increase noise levels along the roadways leading to and from the project site. The resulting increases, while temporary in nature, could be audible to noise-sensitive receptors located along the roadways utilized for this purpose.

Activities required to break up and remove the existing concrete slabs and pavement (located in the southeast corner of the South Village) by haul truck will generate short-term noise increases in August of the year 2015 that would be noticeable to residents who live adjacent to the project site as well as those who live along the roads used by the haul trucks to remove the debris. The concrete and pavement is expected to be cut into manageable sizes with concrete/industrial saws and loaded into haul trucks with rubber-tired loaders for removal.

Approximately 8,424 tons of debris is expected to be generated when the foundation, tennis courts, and parking areas associated with the previous clubhouse are demolished and removed. Approximately 42 truckloads of debris per day would be removed from the South Village for a period of ten days. The haul trucks are expected to use Whitewater Club Drive, Vista Chino, and Indian Canyon drive to transport the debris to the landfill.

The haul trucks may idle during the loading process. The noise levels generated by the passage of these trucks through the residential area located south of the project site will be higher than ambient sound levels and may be audible to residents. However, each haul truck would require a relatively brief period of time to traverse the neighborhood and the daily volume of trucks would represent a relatively small fraction of the total daily traffic volume currently using these roadways. The increase in the ambient noise levels associated with 84 one-way truck trips per day, may be audible and cause annoyance but would not result in any long-term or severe impact considered to be significant.

Construction Activity Noise Increases

Demolition and site preparation activities are expected to occur during August, 2015. Site grading will occur during September 2015 and be completed in approximately three weeks. Trenching activities necessary to underground utilities are projected to require twenty days to complete. Construction of the residential structures is expected to begin in April, 2016 and require up to 3.5 years to complete, including the time necessary to lay asphalt and concrete for the roadways, sidewalks, driveways, trails, and parking lots.

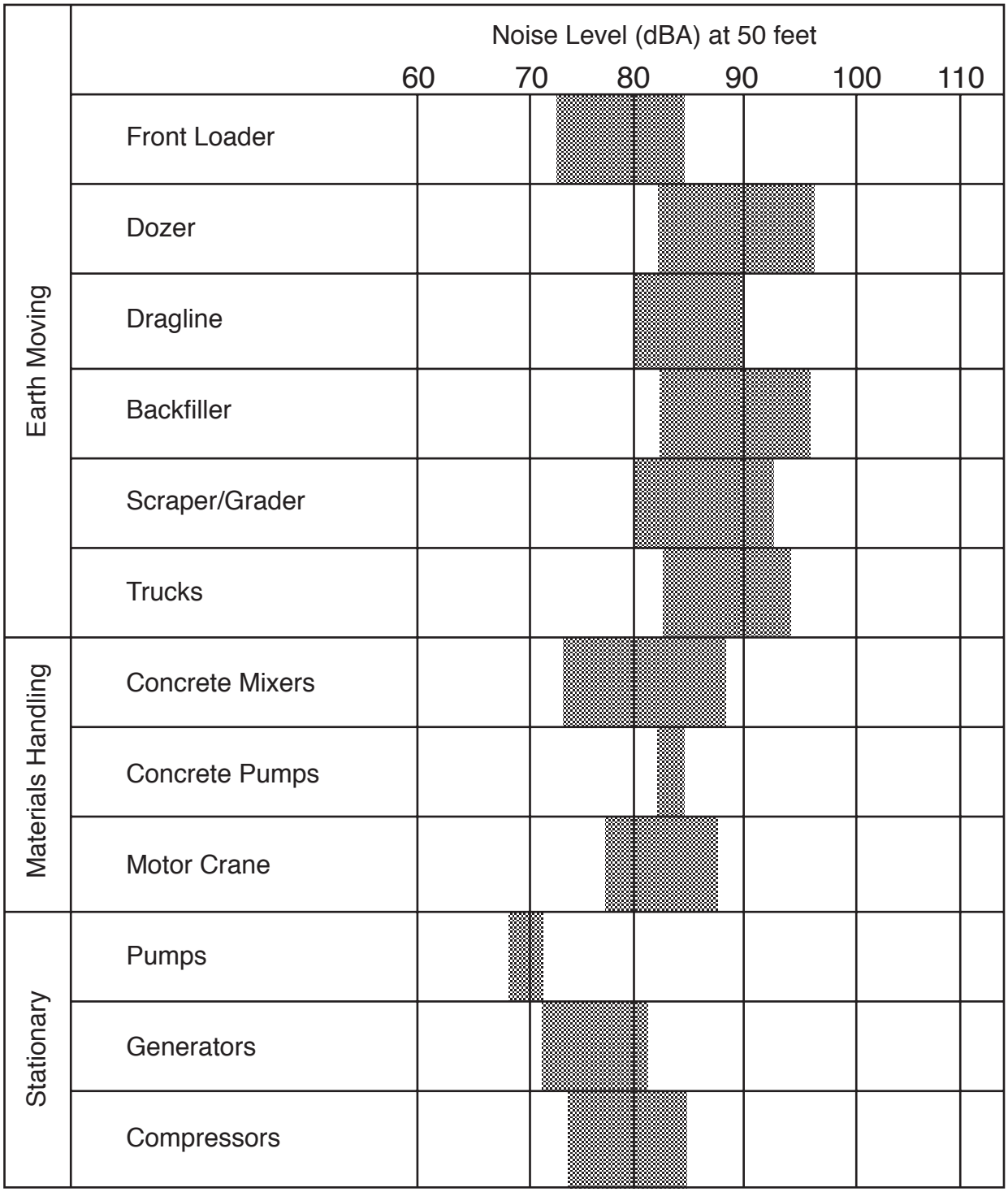
The noise generated by these on-site construction activities may be audible to residents in the surrounding community. Noise levels associated with construction activities will be regulated through the *City of Palm Springs Construction Regulations* and *Noise Ordinance* as well as through environmental specifications in the construction contract and the Noise Control Act of 1972, which sets noise emission standards for construction machinery.

Construction activities are carried out in discrete steps, each of which has its own mix of equipment, and consequently its own noise characteristics. These various sequential phases will change the character of the noise levels surrounding the construction site as work progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow noise ranges to be categorized by work phase. Figure 4-1 illustrates typical construction equipment noise ranges at a distance of 50 feet.

The earth moving equipment category includes excavating machinery (backhoes, bulldozers, shovels, trenchers, front loaders, etc.) and parking lot preparation and paving equipment (compactors, scrapers, graders, pavers, etc.). Typical operating cycles may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Noise levels at 50 feet from earth moving equipment range from 73 to 96 dBA, but relatively little earthwork will be required, given the relatively flat topography of the project site. Three graders are expected to complete the required fine grading within three weeks. Cut and fill quantities are expected to be balanced on-site; therefore, no import or export of soil by haul truck is anticipated.

The Environmental Protection Agency (EPA) has found that the noisiest equipment types operating at construction sites typically range from 88 to 91 dBA at 50 feet. Although noise ranges were found by the EPA to be similar for all construction phases, the erection phase (laying sub-base and paving) tended to be less noisy. Noise levels varied from 79 dBA to 89 dBA at 50 feet during the erection phase of construction. The foundation phase of construction tended to create the highest noise levels, ranging from 88 to 96 dBA at 50 feet.

Figure 4-1
Construction Noise



Source: EPA, 1971; "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances". NTID300.1

Within Palm Springs, construction activities are regulated on a case-by-case basis through conditions placed on entitlement permits and building permits. To reduce the potential for off-site noise impacts, construction equipment hours of operation on-site shall be limited near noise-sensitive land uses by the *Palm Springs Noise Ordinance* (Municipal Code Section 11.74.041) and the *Palm Springs Construction Site Regulations* (Chapter 8.04.220).

The Construction Site Regulations (Municipal Code Chapter 8.04.220) limit construction work to the hours between 7:00 a.m. and 7:00 p.m. on weekdays and between 8:00 a.m. and 5:00 p.m. on Saturdays, if the noise produced is of such intensity or quality that it disturbs the peace and quiet of any other person of normal sensitivity. Construction work is not permitted on Sundays or six major holidays.[1] Construction hours are limited in this manner to maintain quiet during the evening hours, Sundays and holidays, when residents are more likely to be home. Activities conducted as part of the implementation of an approved fugitive dust control program are exempt from these restrictions.

Effects on Sensitive Receptors

The intensity of the noise impacts will depend upon the proximity of the noise-sensitive receptors to the area under construction, the number and type of construction equipment operating each day, and the time interval during which each piece of equipment is operated. Although grading activities typically exhibit one of the highest potentials for noise impacts, the site is relatively flat and has been previously graded. Grading and over excavation activities with three graders are expected to begin in September of 2015 and be completed within approximately three weeks.

Noise generated by a single point source of noise (like a stationary piece of construction equipment) attenuates at a rate of 6 decibels with each doubling of distance between the noise source and the noise receptor. Consequently, surrounding residential development located 100 feet from the construction noise source would benefit from a 6 dBA noise attenuation with distance. Those residences located 200 feet away would benefit from a 12 dB reduction in exterior construction noise levels. When the construction activities occur 400 feet away from residences, an 18 dB reduction in noise levels would occur.

To attenuate 91 dB to 65 dB (a reduction of 26 decibels) would require a distance of 1,000 feet between the construction noise source and a noise receptor assuming flat terrain without barrier interference or field-of-view restrictions (such as intervening buildings or landscaping). Sensitive noise receptors located behind the first row of houses will benefit from some acoustic shielding. The attenuation afforded by the first row of homes is likely to be approximately 5 dBA because the residential buildings occupy 65 to 90 percent of the lot width. Each subsequent row of homes would attenuate the exterior noise levels behind them by approximately 1.5 dBA.

Masonry buildings with single-glazed windows should achieve an exterior to interior noise reduction of 25 dB. Light frame buildings with ordinary sash windows closed should achieve a 20 dB exterior to interior noise reduction.

The levels of construction noise expected to occur within the neighborhoods surrounding the project site may cause annoyance and could generate complaints. However, long-term hearing loss or other severe effects are not expected to result. Hearing loss is not likely to

1. These holidays include: Thanksgiving Day, Christmas Day, New Years Day, July 4th, Labor Day and Memorial Day.

occur, since construction operating cycles will be limited to the less-sensitive hours of the day and generate noise levels that are intermittent.

In the *Palm Springs 2007 General Plan*, the City of Palm Springs has identified temporary construction noise as an area of concern because construction noise frequently provokes community annoyance and complaints. This may occur because a substantial portion of the City of Palm Springs residents are retired and more likely to be at their residence during the daytime hours when construction activities typically occur. As a result, it will be important to incorporate all feasible noise reducing measures into the construction specifications to ensure that the potential for adverse impacts on the adjacent community is reduced to the maximum extent feasible.

4.3 LONG-TERM OPERATIONAL IMPACTS

Long-term noise concerns associated with the increase in development intensity of the project site center primarily on mobile source noise emissions along the access roadways in the study area. The potential would exist for off-site noise impacts in the adjacent noise-sensitive residential areas as a result of project-related traffic increases on site access roads. The potential would also exist for the intrusion of noise into the surrounding residential community associated with activities within the future public park site proposed at the southeast corner of the South Village. On-site acoustic impacts are unlikely to result from motor vehicle noise generated by ultimate traffic volumes on the master planned roadways within the project site.

The 60 dB CNEL contour represents the zone within which any proposed noise-sensitive land use should be evaluated on a project-specific basis to determine if it requires mitigation to meet City or State (Title 24) noise standards. The 65 CNEL contour represents the level at which any new noise-sensitive uses will require mitigation in order to comply with local noise standards. Although the land uses proposed on-site are considered noise-sensitive uses, they will be constructed outside of the 60 CNEL contours associated with transportation-related facilities. No stationary noise sources are located within the vicinity of the project site.

Off-Site Vehicular Noise Impacts

The Preferred Alternative would result in the highest weekday trip generation (3,740 weekday trip-ends) of the four alternatives considered. The Preferred Alternative was evaluated as the development scenario with the highest potential for off-site motor vehicle noise impacts. Alternative 2 would replace some of the residential development in the South Village with a 20-acre soccer park and generate approximately 3,290 weekday trips. Alternative 3 would develop 272 single-family detached dwelling units on 10,000 square-foot lots and generate an estimated 2,610 weekday trips. With Alternative 4, the no development alternative, the site would remain vacant and not generate any trips other than those required to maintain dust suppression measures.

Noise levels on area streets were quantified for the year 2020 (when construction of the proposed project is expected to be complete) and the future planning horizon year 2030. Traffic volumes in the year 2020 (with and without the Preferred Alternative) were analyzed to determine the impact of the proposed project on motor vehicle noise levels in the vicinity upon project completion. In addition, year 2030 (the General Plan build out year) traffic volumes were evaluated to forecast ultimate noise levels both on-site and within the study area. This allowed the significance of the worst-case long-term increases in motor vehicle noise associated with the proposed project to be identified.

Since noise increases or decreases of 1.0 dBA cannot be perceived in a community setting, motor vehicle noise impacts of this magnitude were not considered significant. Changes in motor vehicle noise levels that exceeded 3.0 dBA were considered potentially audible outside of a laboratory setting and therefore potentially significant, provided noise-sensitive receptors would be affected.

Off-Site Vehicular Noise Impacts

Noise levels on area streets were quantified for two different future horizon years (the year 2020 and the year 2030). Traffic volumes in the year 2020 (with and without the proposed project) were analyzed to determine the project-related impact on motor vehicle noise levels in the vicinity upon project completion. Year 2030 traffic volumes were evaluated to forecast ultimate noise levels in the study area upon General Plan build out and identify the significance of long-term project-related increases in motor vehicle noise levels.

Year 2020 Noise Impacts

The projected year 2020+project noise levels adjacent to roadways carrying appreciable volumes of project-related traffic are shown in Table 4-1. As shown therein, noise levels at 50 feet from the centerline of each facility will range from a low of 53.0 CNEL along Via Escuela (east of Gene Autry Trail) to a high of 80.6 CNEL along Vista Chino (east of Farrell Drive). The 70 CNEL contour will remain within the right-of-way along fifteen of the roadway segments analyzed. The 65 CNEL contour will remain within the right-of-way along ten of the roadway segments analyzed.

Table 4-2 details the projected increase in year 2020 motor vehicle noise associated with project-related traffic on each roadway segment evaluated. As shown therein, the proposed project would generate a perceptible noise increase (greater than 3.0 dBA) along only one of the thirty-eight roadway segments evaluated.

An audible noise increase of 3.2 dBA is projected to occur adjacent to Whitewater Club Drive, between Via Escuela and Verona Road. This roadway exists today and would provide access for the South Village, including the proposed future public park site. The future noise level at 50 feet from the centerline of Whitewater Club Drive upon General Plan build out is projected to remain below 60 CNEL. The existing residential land uses adjacent to Whitewater Club Drive would be compatible with the future exterior noise exposure of 59.9 CNEL. Therefore, the project-related noise increase of 3.2 dBA along Whitewater Club Drive, between Via Escuela and Verona Road, would be considered a less than significant noise impact.

Noise increases of less than 3 decibels at locations where the ambient noise level would not exceed the City of Palm Springs noise performance standard for the adjacent land use type are not considered significant. Two of the roadway segments modeled are projected to generate motor vehicle noise levels more than one decibel but less than three decibels above the ambient noise levels as a direct result of the Preferred Alternative traffic increases in the year 2020. These two roadway segments include: (1) San Rafael Drive (east of Sunrise Way), and (2) Farrell Drive (north of Racquet Club Road).

Following the addition of project-related traffic volumes in the year 2020, a potentially audible noise increase of 2.7 dBA is projected to occur adjacent to San Rafael Drive, east of Sunrise Way. This roadway segment is located immediately west of the project site and would be utilized by project-related traffic for site access.

Table 4-1
Year 2020+Preferred Alternative Exterior Noise Exposure
Adjacent to Area Roadways

Roadway Segment	A.D.T.[a] (Veh/Day)	CNEL @ 50 Feet[b]	Distance to Contours (Ft.)[b] 70 dBA	65 dBA	60 dBA
Sunrise Way					
- North of San Rafael Drive	8,130	72.5	82	248	780
- South of San Rafael Drive	15,310	75.3	151	471	1,486
- North of Racquet Club Road	16,310	75.6	161	504	1,593
- South of Racquet Club Road	14,220	75.0	141	439	1,387
- North of Via Escuela	14,520	75.1	144	449	1,420
- South of Via Escuela	16,000	75.5	157	493	1,557
- North of Vista Chino	17,100	75.8	168	528	1,668
- South of Vista Chino	21,210	76.7	207	649	2,052
Farrell Drive					
- North of Racquet Club Road	2,330	58.5	R/W	R/W	R/W
- South of Racquet Club Road	11,240	73.7	111	346	1,094
- North of Via Escuela	11,120	73.6	108	338	1,069
- South of Via Escuela	11,570	73.8	113	354	1,119
- North of Vista Chino	11,710	73.9	116	363	1,145
- South of Vista Chino	17,840	75.7	174	548	1,733
Whitewater Club Drive					
- North of Via Escuela	3,180	59.9	R/W	R/W	49
- South of Via Escuela	1,140	55.4	R/W	R/W	R/W
- North of Vista Chino	1,260	55.8	R/W	R/W	R/W
Gene Autry Trail					
- North of Via Escuela	35,100	80.3	471	1,486	4,700
- South of Via Escuela	32,670	79.9	429	1,356	4,287
San Rafael Drive					
- West of Sunrise Way	8,170	68.7	R/W	111	346
- East of Sunrise Way	3,210	59.9	R/W	R/W	49
Racquet Club Road					
- West of Sunrise Way	9,330	69.2	R/W	124	388
- East of Sunrise Way	11,550	70.2	52	156	489
- West of Farrell Drive	10,920	69.9	49	145	456
Via Escuela					
- West of Sunrise Way	2,790	59.3	R/W	R/W	43
- East of Sunrise Way	3,420	60.2	R/W	R/W	52
- West of Farrell Drive	3,470	60.2	R/W	R/W	52
- East of Farrell Drive	6,850	63.2	R/W	33	104
- West of Whitewater Club Dr.	5,080	61.9	R/W	R/W	77
- East of Whitewater Club Dr.	7,450	63.6	R/W	36	114
- West of Gene Autry Trail	7,030	63.3	R/W	34	106
- East of Gene Autry Trail	660	53.0	R/W	R/W	R/W

a. Average daily two-way traffic volume in the year 2020 with the Preferred Alternative.
b. Distances shown are from the roadway centerline. R/W means the contour falls within the right-of-way.

Table 4-1
Year 2020+Preferred Alternative Exterior Noise Exposure
Adjacent to Area Roadways

Roadway Segment	A.D.T.[a] (Veh/Day)	CNEL @ 50 Feet[b]	Distance to Contours (Ft.)[b] 70 dBA	65 dBA	60 dBA
Vista Chino					
- West of Sunrise Way	22,470	77.4	222	696	2,198
- East of Sunrise Way	25,440	77.9	248	781	2,467
- West of Farrell Drive	31,290	78.8	305	960	3,034
- East of Farrell Drive	40,370	80.6	460	1,453	4,593
- West of Whitewater Club Dr.	41,730	80.3	471	1,486	4,700
- East of Whitewater Club Dr.	42,680	80.4	482	1,521	4,810

a. Average daily two-way traffic volume in the year 2020 with the Preferred Alternative.
b. Distances shown are from the roadway centerline. R/W means the contour falls within the right-of-way.

Table 4-2
Increase in Year 2020 Motor Vehicle Noise
At Fifty Feet With Preferred Alternative

Roadway Segment	Without Preferred[a] Alternative (CNEL)	With Preferred Alternative (CNEL)	Increase (dBA)
Sunrise Way			
- North of San Rafael Drive	72.3	72.5	0.2
- South of San Rafael Drive	75.0	75.3	0.3
- North of Racquet Club Road	75.3	75.6	0.3
- South of Racquet Club Road	74.7	75.0	0.3
- North of Via Escuela	74.8	75.1	0.3
- South of Via Escuela	75.2	75.5	0.3
- North of Vista Chino	75.6	75.8	0.2
- South of Vista Chino	76.6	76.7	0.1
Farrell Drive			
- North of Racquet Club Road	57.2	58.5	1.3
- South of Racquet Club Road	73.6	73.7	0.1
- North of Via Escuela	73.6	73.6	0.0
- South of Via Escuela	73.7	73.8	0.1
- North of Vista Chino	73.7	73.9	0.2
- South of Vista Chino	75.6	75.7	0.1
Whitewater Club Drive			
- North of Via Escuela	56.7	59.9	3.2
- South of Via Escuela	54.5	55.4	0.9
- North of Vista Chino	55.0	55.8	0.8
Gene Autry Trail			
- North of Via Escuela	80.2	80.3	0.1
- South of Via Escuela	79.9	79.9	0.0

a. See Appendix B for assumptions. CNEL values are given at 50 feet from the roadway centerline. Year 2020 noise levels and traffic volumes without the Preferred Alternative are provided in Appendix C.

Table 4-2 (Continued)
Increase in Year 2020 Motor Vehicle Noise
At Fifty Feet With Preferred Alternative

Roadway Segment	Without Preferred[a] Alternative (CNEL)	With Preferred Alternative (CNEL)	Increase (dBA)
San Rafael Drive			
- West of Sunrise Way	68.5	68.7	0.2
- East of Sunrise Way	57.2	59.9	2.7
Racquet Club Road			
- West of Sunrise Way	69.1	69.2	0.1
- East of Sunrise Way	69.9	70.2	0.3
- West of Farrell Drive	69.6	69.9	0.3
Via Escuela			
- West of Sunrise Way	58.9	59.3	0.4
- East of Sunrise Way	59.4	60.2	0.8
- West of Farrell Drive	59.5	60.2	0.7
- East of Farrell Drive	62.7	63.2	0.5
- West of Whitewater Club Drive	61.2	61.9	0.7
- East of Whitewater Club Drive	62.9	63.6	0.7
- West of Gene Autry Trail	62.7	63.3	0.6
- East of Gene Autry Trail	53.0	53.0	0.0
Vista Chino			
- West of Sunrise Way	77.3	77.4	0.1
- East of Sunrise Way	77.9	77.9	0.0
- West of Farrell Drive	78.8	78.8	0.0
- East of Farrell Drive	80.6	80.6	0.0
- West of Whitewater Club Drive	80.3	80.3	0.0
- East of Whitewater Club Drive	80.4	80.4	0.0

a. See Appendix B for assumptions. CNEL values are given at 50 feet from the roadway centerline. Year 2020 noise levels and traffic volumes without the Preferred Alternative are provided in Appendix C.

Although residents of the Four Seasons at Palm Springs community and the Golden Sands Mobile Home Park use this roadway for access, the current weekday traffic volumes are relatively low (approximately 1,650 vehicles per day). The Preferred Alternative would increase the traffic volume on this roadway by 1,490 vehicles per day. Following this traffic increase, the noise levels at fifty feet from the centerline of San Rafael Drive (east of Sunrise Way) are projected to remain below 60 CNEL. Therefore, the project-related incremental motor vehicle noise increase is not considered significant.

Following the addition of site traffic in the year 2020, a noise increase of 1.3 dBA is projected to occur along Farrell Drive, north of Racquet Club Road. There are two single-family dwelling units adjacent to each side of Farrell Drive at this location. The exterior noise levels at 50 feet from the centerline of Farrell Drive (north of Racquet Club Road) are projected to be 58.5 CNEL, following the addition of the traffic generated by the Preferred Alternative. Single-family residential land uses are considered compatible uses where the exterior noise levels are below 60 CNEL. The projected noise increase of 1.3 dBA would be imperceptible to the adjacent residents. The project-related incremental motor vehicle noise increase is not considered significant and no mitigation would be required.

Project-related motor vehicle noise increases of 1.0 decibel or less are projected to occur in the year 2020 adjacent to the remaining twenty-nine roadway segments modeled. Since noise increases or decreases of 1.0 dBA cannot be perceived in the community, project-related motor vehicle noise impacts of this magnitude are considered less than significant.

Year 2030 Noise Impacts

Table 4-3 presents motor vehicle noise levels in the study area in the year 2030 with the proposed project. As shown therein, noise levels at 50 feet from the centerline of the roadway segments evaluated would range from a low of 53.3 CNEL along Via Escuela, east of Gene Autry Trail, to a high of 81.7 CNEL along Vista Chino, between Farrell Drive and Whitewater Club Drive.

Table 4-4 details the projected increase in year 2030 motor vehicle noise associated with project-related traffic on each roadway segment modeled. As shown therein, the proposed project would generate a perceptible noise increase (greater than 3.0 dBA) along one roadway segment that would provide access to the South Village.

An audible noise increase of 3.1 dBA is projected to occur adjacent to Whitewater Club Drive, north of Via Escuela. With the project-related noise increase, the noise levels anticipated adjacent to this roadway segment are projected to be 60 CNEL at fifty feet from the centerline.

Noise increases of less than 3.0 dBA are projected to occur upon General Plan build out with the proposed project along all of the remaining roadway segments evaluated in the project vicinity. Since noise increases of 3.0 dBA or less are imperceptible, the project-related incremental motor vehicle noise increases of this magnitude are not considered significant.

Table 4-5 shows the number of roadway segments modeled within the study area that are projected to be generating future noise levels at fifty feet from their centerline within various noise level ranges. Values are provided therein for conditions with and without traffic generated by the Preferred Alternative for the year 2020 and the year 2030.

Thirteen of the roadway segments modeled (34.2 percent) are projected to generate noise levels that would exceed 75 CNEL at 50 feet from their centerline by the year 2020. Project-related traffic is projected to increase the number of roadway segments in this category to fifteen (39.5 percent). Site traffic is projected to increase the number of roadway segments generating noise levels between 60.1 CNEL and 65.0 CNEL from four to six. As a result, the percentage of roadway segments modeled that will fall into this category in the year 2020 is projected to increase from 10.5 percent to 15.8 percent. Project-related traffic volumes are expected to increase the number of roadway segments that would generate between 70.1 and 75.0 CNEL in the year 2030 from six to seven. This would increase the percentage of the roadway segments within this category from 15.8 to 18.4 percent.

Off-Site Operational Noise Impacts

The project includes residential land uses that would generate operational noise levels similar to those generated by the surrounding residential community. No significant adverse operational noise impacts are expected to occur as a result of the residential land uses proposed.

Table 4-3
Year 2030+Preferred Alternative Exterior Noise Exposure
Adjacent to Area Roadways

Roadway	A.D.T.[a] (Veh/Day)	CNEL @ 50 Feet[b]	Distance to Contours (Ft.)[b] 70 dBA	65 dBA	60 dBA
Sunrise Way					
- North of San Rafael Drive	19,980	76.5	197	620	1,959
- South of San Rafael Drive	25,370	77.5	248	780	2,467
- North of Racquet Club Road	25,370	77.5	248	780	2,467
- South of Racquet Club Road	20,850	76.6	202	634	2,005
- North of Via Escuela	20,850	76.6	202	634	2,005
- South of Via Escuela	20,960	76.7	207	649	2,052
- North of Vista Chino	20,960	76.7	207	649	2,052
- South of Vista Chino	22,400	76.9	216	680	2,148
Farrell Drive					
- North of Racquet Club Road	3,000	59.6	R/W	R/W	46
- South of Racquet Club Road	11,890	73.9	116	363	1,145
- North of Via Escuela	11,760	73.9	116	363	1,145
- South of Via Escuela	12,220	74.1	121	380	1,199
- North of Vista Chino	12,360	74.1	121	380	1,199
- South of Vista Chino	21,620	76.5	209	659	2,084
Whitewater Club Drive					
- North of Via Escuela	3,260	60.0	R/W	R/W	50
- South of Via Escuela	1,190	55.6	R/W	R/W	R/W
- North of Vista Chino	1,320	56.0	R/W	R/W	R/W
Gene Autry Trail					
- North of Via Escuela	41,620	81.0	553	1,746	5,522
- South of Via Escuela	36,970	80.5	493	1,557	4,922
San Rafael Drive					
- West of Sunrise Way	9,860	69.5	45	133	416
- East of Sunrise Way	3,310	60.0	R/W	R/W	50
Racquet Club Road					
- West of Sunrise Way	11,070	70.0	50	149	467
- East of Sunrise Way	13,850	71.0	61	187	588
- West of Farrell Drive	11,510	70.1	51	152	478
Via Escuela					
- West of Sunrise Way	2,940	59.5	R/W	R/W	45
- East of Sunrise Way	4,960	61.8	R/W	R/W	75
- West of Farrell Drive	4,960	61.8	R/W	R/W	75
- East of Farrell Drive	10,850	65.2	R/W	52	164
- West of Whitewater Club Dr.	5,950	62.6	R/W	R/W	91
- East of Whitewater Club Dr.	9,390	64.6	R/W	46	143
- West of Gene Autry Trail	9,390	64.6	R/W	46	143
- East of Gene Autry Trail	700	53.3	R/W	R/W	R/W

a. Average daily two-way traffic volume in the year 2030 with the Preferred Alternative.
b. Distances shown are from the roadway centerline. R/W means the contour falls within the right-of-way.

Table 4-3
Year 2030+Preferred Alternative Exterior Noise Exposure
Adjacent to Area Roadways

Roadway	A.D.T.[a] (Veh/Day)	CNEL @ 50 Feet[b]	Distance to Contours (Ft.)[b] 70 dBA	65 dBA	60 dBA
Vista Chino					
- West of Sunrise Way	26,940	78.2	266	836	2,643
- East of Sunrise Way	31,760	78.9	312	982	3,105
- West of Farrell Drive	46,460	80.5	450	1,420	4,488
- East of Farrell Drive	51,800	81.7	592	1,871	5,917
- West of Whitewater Club Dr.	57,000	81.7	649	2,052	6,488
- East of Whitewater Club Dr.	60,380	82.0	696	2,199	6,952

a. A.D.T. means average daily two-way traffic volume for year 2030+project conditions.
b. Distances shown are from the roadway centerline. R/W means the contour falls within the right-of-way.

Table 4-4
Increase in Year 2030 Motor Vehicle Noise
At Fifty Feet With the Preferred Alternative

Roadway Segment	Without Preferred[a] Alternative (CNEL)	With Preferred Alternative (CNEL)	Increase (dBA)
Sunrise Way			
- North of San Rafael Drive	72.7	72.8	0.1
- South of San Rafael Drive	77.3	77.5	0.2
- North of Racquet Club Road	77.3	77.5	0.2
- South of Racquet Club Road	76.5	76.6	0.1
- North of Via Escuela	76.5	76.6	0.1
- South of Via Escuela	76.5	76.7	0.2
- North of Vista Chino	76.5	76.7	0.2
- South of Vista Chino	76.8	76.9	0.1
Farrell Drive			
- North of Racquet Club Road	58.6	59.6	1.0
- South of Racquet Club Road	73.9	73.9	0.0
- North of Via Escuela	73.8	73.9	0.1
- South of Via Escuela	73.9	74.1	0.2
- North of Vista Chino	74.0	74.1	0.1
- South of Vista Chino	76.5	76.5	0.0
Whitewater Club Drive			
- North of Via Escuela	56.9	60.0	3.1
- South of Via Escuela	54.7	55.6	0.9
- North of Vista Chino	55.3	56.0	0.7
Gene Autry Trail			
- North of Via Escuela	80.9	81.0	0.1
- South of Via Escuela	80.4	80.5	0.1

a. CNEL values are given at 50 feet from all roadway centerlines (see Appendix B for assumptions). Year 2030 ambient roadway noise levels and traffic volumes are provided in Appendix D.

Table 4-4
Increase in Year 2030 Motor Vehicle Noise
At Fifty Feet With the Preferred Alternative

Roadway Segment	Without Preferred[a] Alternative (CNEL)	With Preferred Alternative (CNEL)	Increase (dBA)
San Rafael Drive			
- West of Sunrise Way	69.4	69.5	0.1
- East of Sunrise Way	57.4	60.0	2.6
Racquet Club Road			
- West of Sunrise Way	69.8	70.0	0.2
- East of Sunrise Way	70.7	71.0	0.3
- West of Farrell Drive	69.9	70.1	0.2
Via Escuela			
- West of Sunrise Way	59.2	59.5	0.3
- East of Sunrise Way	61.3	61.8	0.5
- West of Farrell Drive	61.3	61.8	0.5
- East of Farrell Drive	64.9	65.2	0.3
- West of Whitewater Club Drive	62.0	62.6	0.6
- East of Whitewater Club Drive	64.1	64.6	0.5
- West of Gene Autry Trail	64.1	64.6	0.5
- East of Gene Autry Trail	53.3	53.3	0.0
Vista Chino			
- West of Sunrise Way	78.1	78.2	0.1
- East of Sunrise Way	78.8	78.9	0.1
- West of Farrell Drive	80.5	80.5	0.0
- East of Farrell Drive	81.7	81.7	0.0
- West of Whitewater Club Drive	81.7	81.7	0.0
- East of Whitewater Club Drive	81.9	82.0	0.1

a. CNEL values are given at 50 feet from all roadway centerlines (see Appendix B for assumptions). Year 2030 ambient roadway noise levels and traffic volumes are provided in Appendix D.

Future activities within the proposed public park site may occasionally generate noise levels that are audible within the surrounding community. These sporadic noise levels are expected to occur infrequently and last for relatively brief intervals. Other than noise generated by landscape maintenance equipment (lawn mowers, leaf blowers, etc.) the typical activities at the park site will generate relatively low noise levels. Activities within the park will be subject to the provisions of the *Palm Springs Noise Ordinance* (Municipal Code Section 11.74.041).

On-Site Aircraft Noise Impacts

When land exposed to aircraft noise is developed, both current and future noise levels within the Airport Influence Area should be considered in evaluating the compatibility of the proposed land use with airport noise and ensuring that appropriate noise mitigation is incorporated in the project design. The *Riverside County Airport Land Use Compatibility Plan* outlines procedures and criteria for use is reviewing proposed developments for compatibility with airport activity. It also provides airport noise contours and identifies Compatibility Zones within the Airport Influence Area, based on the exposure of each area

to aircraft noise, land use safety concerns, the protection of airport airspace, and general concerns related to overflights.

Table 4-5
Area Roadway Segments With Future Noise Levels
At 50 Feet Within Various Ranges By Scenario[a]

Noise Exposure Range At 50 Feet From Roadway Centerline	Year 2020 No Project	Year 2020 + Project	Year 2030 No Project	Year 2030 + Project
Number of Roadway Segments Generating Noise Levels By Range				
- 60.0 CNEL or Less	9	7	7	7
- 60.1 CNEL-65.0 CNEL	4	6	6	5
- 65.1 CNEL-70.0 CNEL	4	3	3	3
- 70.1 CNEL-75.0 CNEL	8	7	6	7
- 75.1 CNEL or Greater	13	15	16	16
Percentage of Roadway Segments Generating Noise Levels By Range				
- 60.0 CNEL or Less	23.7%	18.4%	18.4%	18.4%
- 60.1 CNEL-65.0 CNEL	10.5%	15.8%	15.8%	13.2%
- 65.1 CNEL-70.0 CNEL	10.5%	7.9%	7.9%	7.9%
- 70.1 CNEL-75.0 CNEL	21.1%	18.4%	15.8%	18.4%
- 75.1 CNEL or Greater	34.2%	39.5%	42.1%	42.1%

a. Values shown representing conditions with the proposed project reflect the Preferred Alternative.

The Palm Springs International Airport noise contours used to evaluate airport/land use noise compatibility are determined from: (1) the current and future single-event noise levels associated with the each aircraft type in the fleet; (2) the existing and future aircraft fleet mix; (3) the number of current and future aircraft operations at the airport; and (4) the locations of the standard flight paths flown by approaching and departing aircraft. Changes in some of these factors over time can increase noise levels whereas changes in other factors can offset or even reduce future noise levels.

The airport activity levels are projected to increase from 109,500 annual aircraft operations in the year 2002 to 170,260 annual aircraft operations by the year 2020. The anticipated growth in aircraft activity would be expected to result in future noise contours being larger than the current contours. However, the future noise levels associated with the airline and corporate jets (i.e., the primary noise sources at the Palm Springs International Airport) are projected to decrease as newer quieter models are added to the airline and general aviation fleets. As a result, the long-range noise contours are expected to be slightly smaller than the current noise contours, despite the projected growth in airport activity. The reduction reflects the reduced single-event noise levels produced by the future aircraft fleet mix, compared to the current fleet mix.

To evaluate land use compatibility with aircraft noise where the current noise contours are larger than the future contours, Policy 4.1.2 (a) of the *Riverside County Airport Land Use Compatibility Plan Policy Document* (Adopted October 2004) recommends that a composite of the contours for the two time frames be considered. The *Airport Master Plan* adopted by the City of Palm Springs in 2002 is the basis for the *Compatibility Plan*, which

uses a composite of the 2002 and 2020 noise contours. At the resolution used to depict the Palm Springs International Airport noise contours, the composite (year 2002 and year 2020) 60 dB CNEL and 65 dB CNEL contours in the vicinity of the project site appear identical to the year 2002 contours.[2]

The Palm Springs International Airport composite noise compatibility contours for the year 2002 and the year 2020 are shown in Figure 3-4. As shown therein, the new residential land uses proposed within the project site would be in an area with a composite airport noise exposure below 60 dB CNEL. The southwest corners of both the North Village and the South Village are located approximately 700 feet outside of the 60 dB CNEL contour associated with aircraft operations on an annual average day at the Palm Springs International Airport. The southwest corner of the South Village is located approximately 2,080 feet outside of the 65 CNEL contour. At its closest point, the North Village is located approximately 0.75 mile outside of the 65 CNEL contour associated with aircraft operations at the Palm Springs International Airport.

The City of Palm Springs has adopted 62 dB CNEL as the maximum noise exposure considered normally acceptable for new residential land uses in areas exposed to aircraft noise associated with the Palm Springs International Airport. This threshold takes into account the community's long-standing exposure to the noise of airline aircraft operations. Based upon this criterion, the new residential land uses proposed would be considered compatible land uses with respect to the aircraft noise exposure of the project site.

The Airport Influence Area surrounding the Palm Springs International Airport has been divided into Compatibility Zones (designated Zone A through Zone E) based upon factors related to potential noise impacts, overflights at low altitudes, safety concerns, and airspace protection. As required by state law, certain development proposals/land use actions within these Compatibility Zones are subject to review by the Riverside County Airport Land Use Commission (ALUC). The Riverside County ALUC review of such actions is advisory. Local jurisdictions may elect to approve a project without incorporating design changes suggested by the ALUC.

The North Village Planning Area is located entirely within Compatibility Zone C. Palm Springs Compatibility Policy 2.2 states that residential densities in Zone C shall either be kept to a very low density of no more than 0.2 dwelling units per acre or be in the range of 3.0 to 15.0 dwelling units per acre. The basic compatibility criteria identified in the *Riverside County Airport Land Use Compatibility Plan Policy Document* specifies for residential development in Zone C that 20 percent of the land remain as open space (as defined in Policy 4.2.4) that can function as a light aircraft landing site for a controlled emergency landing. Another development condition for residential development in Zone C requires the inclusion of a minimum noise level reduction of 20 dB (per Policy 4.1.6). This required sound level attenuation from outside to inside the residential structures is determined with windows closed and intended to provide for a maximum aircraft-related interior noise level of 45 dB CNEL in any habitable room of single-family or multi-family residences, within which interior activities may be easily disrupted by noise.

The South Village Planning Area is located almost entirely within Compatibility Zone D. Palm Springs Compatibility Policy 2.3 states that residential densities in Zone D shall either be kept to a very low density (no more than 0.2 dwelling units per acre) or be greater than 5 dwelling units per acre. However, densities as low as 3.0 dwelling units per acre are

2. *Riverside County Airport Land Use Compatibility Plan Policy Document* (Adopted March 2005) with noise compatibility contours from the *Palm Springs International Airport Master Plan Study* (May 2003).

permitted to the extent that such densities are typical of existing residential development in nearby areas of the community. The *Riverside County Airport Land Use Compatibility Plan Policy Document* specifies for residential development in Zone D that 10 percent of the land remain as open space (as defined in Policy 4.2.4).

As part of residential real estate transactions, state statutes require the disclosure of information regarding whether the property is situated within an Airport Influence Area, including the airport proximity, and the existence of aircraft overflights. In addition to real estate transfer disclosure requirements, a deed notice is required and shall be recorded for each parcel associated with any discretionary land use action affecting property within an Airport Influence Area (per Policy 4.4.2 of the *Riverside County Airport Land Use Compatibility Plan Policy Document*).

In Policy PS.2.5, the *Riverside County Airport Land Use Compatibility Plan Policy Document* specifies expanded buyer awareness measures required of any new single-family or multi-family residential development proposed for construction anywhere within the Palm Springs International Airport Influence Area (other than Zone E). The following measures are intended to ensure that prospective buyers or renters are informed about the presence of aircraft overflights. During initial sales of properties within newly created subdivisions, large airport-related informational signs shall be installed and maintained by the developer. These signs shall be installed in conspicuous locations and shall clearly depict the proximity of the property to the airport and aircraft traffic patterns. In addition, an informational brochure shall be provided to prospective buyers or renters showing: (1) the locations of aircraft flight patterns; (2) the frequency of overflights; (3) the typical altitudes of the aircraft; and (4) the range of noise levels that can be expected from individual aircraft overflights.

5.0 NOISE MITIGATION MEASURES

Noise standards are implemented at various points in the planning and design of a development. At the preliminary planning levels, the land use type and density near noisy transportation facilities can be controlled. Later, at more detailed planning levels, proper structure arrangement and orientation can be evaluated, with approval conditioned upon setbacks, landscaped buffers, etc., that can resolve noise difficulties. Detailed noise abatement requirements such as architectural design, acoustic construction techniques and the erection of noise barriers are established at the final stages of the planning process, when deemed necessary.

Long-term acoustic impacts can be mitigated more effectively through proper site design than through the use of noise reducing construction techniques. Consequently, the mitigation strategies identified in the pages which follow take the form of suggested design guidelines for use in detailed planning efforts.

5.1 GENERAL METHODS TO REDUCE NOISE IMPACTS

There are several basic techniques available to minimize the adverse effects of noise on sensitive noise receivers. Classical engineering principles suggest controlling the noise source when ever feasible and protecting the noise receptors when noise source control measures are inadequate. Many of the noise source control mechanisms are being applied by state and Federal governments. Acoustic site planning, architectural design, acoustic construction techniques and the erection of noise barriers are all effective methods for reducing noise impacts when source control mechanisms are insufficient to achieve desired results.

Acoustic site planning involves the careful arrangement of land uses, lots and buildings to minimize intrusive noise levels. The placement of noise compatible land uses between the roadway and more sensitive uses is an effective planning technique. The use of buildings as noise barriers and their orientation away from the source of noise, can shield sensitive activities, entrances and common open space areas. Clustered and planned unit developments can maximize the amount of open space available for landscaped buffers in place of continuous noise barriers next to heavily traveled roadways.

Acoustic architectural design involves the incorporation of noise reducing strategies in the design and lay-out of individual structures. Building heights, room arrangements, window size and placement, balcony and courtyard design, and the provision of air conditioning all play an important role in shielding noise-sensitive activities from intrusive noise levels. Roof designs which reflect the noise back towards the roadway also reduce noise intrusion into adjacent tracts.

Acoustic construction is the treatment of various parts of a building to reduce interior noise levels. Acoustic wall design, doors, ceilings and floors, as well as dense building materials, the use of acoustic windows (double glazed, double paned, thick, non-openable, or small with air-tight seals) and the inclusion of maximum air spaces in attics and walls are all available options.

Normal construction techniques generally provide a 20 dBA reduction from outside to inside noise levels with windows closed. New energy insulation requirements for buildings can produce up to 25 dBA exterior to interior noise reductions with windows closed and 10

dBA reductions with open windows. Consequently, buildings with exterior noise exposures up to 70 dBA can achieve 45 dBA interior noise levels with standard construction techniques.

Any solid barrier that hides the passing vehicles from view on abutting properties will reduce traffic noise. To be an adequate noise shield, the mass and stiffness of the barrier must be sufficient to prevent bending or buckling and it must not vibrate easily or leak air. Up to 15 dBA reductions can be achieved using noise barriers such as berms and walls made of stucco, reinforced concrete, concrete blocks, or precast concrete panels. Various roadway designs are also effective in reducing traffic noise. Both depressed and elevated roadway designs can by themselves, or in combination with noise barriers, prevent adjacent areas from being exposed to excessive noise levels.

5.2 SPECIFIC RECOMMENDATIONS

The following specific mitigation measures are recommended for incorporation in the project to minimize noise impacts and insure compliance with applicable noise standards.

1. Construction activities within the project site shall be limited to the hours between 7:00 a.m. and 7:00 p.m. on weekdays and between 8:00 a.m. and 5:00 p.m. on Saturdays, as specified by the *Palm Springs Municipal Code* Construction Site Regulations (Chapter 8.04.220) if the noise produced is of such intensity or quality that it disturbs the peace and quiet of any other person of normal sensitivity. Construction work shall not be permitted on Sundays or six major holidays, when residents are more likely to be at home. Activities conducted as part of the implementation of an approved fugitive dust control program are exempt from these limitations.

2. All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers and the engines shall be equipped with shrouds.

3. All construction equipment shall be in proper working order and maintained in a proper state of tune to reduce backfires.

4. Stockpiling and vehicle staging areas shall be located as far as practical from noise-sensitive receptors.

5. Parking, refueling and servicing operations for all heavy equipment and on-site construction vehicles shall be located as far as practical from existing homes.

6. Every effort shall be made during construction activities to create the greatest distance between noise sources and noise-sensitive receptors located in the vicinity of the project site.

7. Stationary equipment shall be placed such that emitted noise is directed away from noise-sensitive receptors.

8. Future on-site development shall comply with all relevant noise policies set forth in the Noise Element of the General Plan.

9. The project shall comply with all requirements identified in the *Riverside County Airport Land Use Compatibility Plan Policy Document* (adopted March 2005) related to residential development within the Palm Springs International Airport Influence Area, as discussed on pages 4-14 and 4-15.

Appendices

A. Noise Glossary
B. Noise Model Assumptions
C. Year 2020 Ambient Exterior Noise Exposure
D. Year 2030 Ambient Exterior Noise Exposure

Appendix A
Noise Glossary

A-Weighted Sound Level (dBA) -- An A-weighted sound level is the sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the response of the human ear and provides good correlation with subjective reactions to noise.

Ambient Noise Level -- The composite noise from all sources near and far is the ambient noise level. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

Barrier -- A natural or man-made object that interrupts the path of sound from the sound from the sound source to the sound receiver.

Community Noise Equivalent Level (CNEL) -- CNEL is the average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five decibels to sound levels occurring during the evening from 7 p.m. to 10 p.m. and addition of ten decibels to sound levels occurring during the night from 10 p.m. to 7 a.m. The 5 and 10 decibel penalties are applied to account for increased noise sensitivity during the evening and nighttime hours. The CNEL represents the daily energy noise exposure averaged on an annual basis. The State of California uses the dBA CNEL noise index to relate community noise exposure to compatibility criteria.

CNEL -- See Community Noise Equivalent Level.

Day-Night Average Noise Level (Ldn) -- The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of 10 decibels to sound levels occurring during the nighttime from 10 p.m. to 7 a.m. The 10-decibel penalty is applied to account for increased noise sensitivity during the nighttime hours. The Ldn represents the daily energy noise exposure averaged on an annual basis and is typically within 1 dBA of the CNEL value.

dB -- See Decibel.

dBA -- See A-Weighted Sound Level.

Decibel (dB) -- A decibel is a unit of measurement on a logarithmic scale which describes the magnitude of a particular quantity of sound pressure or power with respect to a standard reference value. A decibel is equal to 10 times the logarithm (to the base 10) of the ratio of the measured sound pressure squared to a reference pressure (i.e., 20 micro-pascals) squared.

Design Noise Level -- The noise level selected by the designer after consideration of applicable standards for various land use or activity categories to be used for determining traffic noise impacts and the assessment of the noise abatement treatment for a particular highway section.

EPA -- Environmental Protection Agency.

Equivalent Sound Level (Leq) -- An Leq is the sound level corresponding to a steady state sound level containing the same total energy as a time varying sound level over a given sample period.

FHWA -- Federal Highway Administration.

Frequency (Hz) -- The frequency is the number of times per second that a sound pressure signal oscillates about the prevailing atmosphere. The unit of frequency is the hertz.

Habitable Room -- A habitable room is defined as any room meeting the requirements of the Uniform Building Code or other applicable regulations that is intended to be used for sleeping, living, cooking or dining purposes, excluding such enclosed spaces as closets, pantries, bath or toilet rooms, service rooms, connecting corridors, laundries, unfinished attics, foyers, storage spaces, cellars, utility rooms and similar spaces.

Hz -- A unit of measurement of frequency, numerically equal to cycles per second (See Frequency).

Intrusive Noise -- That noise exceeding the existing ambient noise at a given location is termed an intrusive noise. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, time of occurrence and tonal or informational content, as well as prevailing ambient noise level.

Leq -- See Equivalent Sound Level.

Ldn -- See Day-Night Average Noise Level.

Line Source -- A noise source which generates sound along a line rather than at a single fixed point.

L Percentile -- L percentiles represent the A-weighted sound level exceeded for the identified percent of the sample time. For example, a value of 55 dBA L_{10} would mean that 55 dBA was exceeded 10 percent of the time. Other L percentiles commonly used include L_{50}, L_{90}, L_{99}, etc. The L_{50} corresponds to the average level of noise. The L_{10} corresponds to peaks of noise in the time history of environmental noise.

Noise -- Noise is any unwanted sound, or sound that 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 -- Noise attenuation is the ability of a material substance, or medium to reduce the noise level from one place to another or between one room and another. Noise attenuation is specified in decibels.

Noise Contours -- The lines drawn around a noise source indicating constant or equal level of noise exposure from that source are termed noise contours. CNEL and Ldn are typical standards used for comparison.

Noise-Sensitive Area -- An area of regular and intensive human usage where the usage is impaired or restricted when subjected to excessive levels of noise.

Noise Sensitive Land Use -- Noise-sensitive land uses are land uses associated with indoor and/or outdoor human activities that may be subject to stress and/or significant interference from noise. They include residential (single-family and multi-family dwellings, mobile home parks, dormitories and similar uses); transient lodging (including hotels, motels and similar uses); hospitals, nursing homes, convalescent hospitals and other facilities for long-term medical care; and public or private educational facilities, libraries, churches and places of public assembly.

Outdoor Living Area -- Outdoor living area is a term used to define spaces that are associated with residential land uses and are typically used for passive recreational activities. Such spaces include patio areas, barbecue areas, Jacuzzi areas, etc. Outdoor areas usually not included in this definition are front yard areas, driveways, greenbelts, maintenance areas and storage areas associated with residential land uses.

Point Source -- A stationary device which creates sounds while fixed or motionless.

Shadow Zone -- Area of reduced sound levels adjacent to a natural or man-made barrier.

Appendix B
Noise Model Assumptions

I. Temporal Traffic Distribution Assumed (Percent)

Secondary and Larger Highways

Type of Vehicle	Overall	Day	Evening	Night
Automobile	92	69.30	12.90	9.60
Medium Truck	3	1.44	0.06	1.50
Heavy Truck	5	2.40	0.10	2.50

Riverside County Department of Health acoustical parameters for County highways.

Collector and Smaller Streets

Type of Vehicle	Overall	Day	Evening	Night
Automobile	97.4	73.6	13.6	10.22
Medium Truck	1.84	0.90	0.04	0.90
Heavy Truck	0.74	0.35	0.04	0.35

Riverside County Department of Health acoustical parameters for County highways.

II. Road Grade Assumptions -- level terrain and roadway.

III. Roadway Widths Assumed -- were based upon the *Palm Springs Country Club (TTM 36691) Traffic Impact Study* (Endo Engineering, dated February 10, 2014) and field observations.

IV. Speeds Assumed -- are shown in the following table.

V. RD-77-108 Input Parameters -- see the tables on the following pages.

VI. Alpha-- was assumed to be zero (3 decibels per doubling of distance).

Appendix B
Noise Model Assumptions

Roadway Segment	Speed[a] (mph)	Half-Width[b] (feet)	Percent Trucks[c] (% - Medium)	
Sunrise Way				
- North of San Rafael Drive	45	24	8.00	37.50
- South of San Rafael Drive	45	24	8.00	37.50
- North of Racquet Club Road	45	24	8.00	37.50
- South of Racquet Club Road	45	24	8.00	37.50
- North of Via Escuela	45	24	8.00	37.50
- South of Via Escuela	45	24	8.00	37.50
- North of Vista Chino	45	24	8.00	37.50
- South of Vista Chino	45	24	8.00	37.50
Farrell Drive				
- North of Racquet Club Road	25	6	2.58	71.32
- South of Racquet Club Road	45	18	8.00	37.50
- North of Via Escuela	45	18	8.00	37.50
- South of Via Escuela	45	18	8.00	37.50
- North of Vista Chino	45	18	8.00	37.50
- South of Vista Chino	45	18	8.00	37.50
Whitewater Club Drive				
- North of Via Escuela	25	6	2.58	71.32
- South of Via Escuela	25	6	2.58	71.32
- North of Vista Chino	25	6	2.58	71.32
Gene Autry Trail				
- North of Via Escuela	55	24	8.00	37.50
- South of Via Escuela	55	24	8.00	37.50
San Rafael Drive				
- West of Sunrise Way	45	18	2.58	71.32
- East of Sunrise Way	25	6	2.58	71.32
Racquet Club Road				
- West of Sunrise Way	45	18	2.58	71.32
- East of Sunrise Way	45	18	2.58	71.32
- West of Farrell Drive	45	18	2.58	71.32
Via Escuela				
- West of Sunrise Way	25	6	2.58	71.32
- East of Sunrise Way	25	6	2.58	71.32
- West of Farrell Drive	25	6	2.58	71.32
- East of Farrell Drive	25	6	2.58	71.32
- West of Whitewater Club Dr.	25	6	2.58	71.32
- East of Whitewater Club Dr.	25	6	2.58	71.32
- West of Gene Autry Trail	25	6	2.58	71.32
- East of Gene Autry Trail	25	6	2.58	71.32
Vista Chino				
- West of Sunrise Way	45	30	8.00	37.50
- East of Sunrise Way	45	30	8.00	37.50
- West of Farrell Drive	45	30	8.00	37.50
- East of Farrell Drive	50	30	8.00	37.50
- West of Whitewater Club Dr.	50	24	8.00	37.50
- East of Whitewater Club Dr.	50	24	8.00	37.50

a. Speed is based upon posted speed limits or conditions observed during field reconnaissance.
b. The half-width is the distance from the roadway centerline to the center of the outermost travel lane.
c. Truck mix provided by Riverside County Department of Health. The format is truck mix percentage of ADT, followed by the percentage of all trucks that are assumed to be medium-duty (2-axle) trucks.

Appendix C
Year 2020 Ambient Exterior Noise Exposure

Roadway Segment	A.D.T.[a] (Veh/Day)	CNEL @ 50 Feet[b]	Distance to Contours (Ft.)[c] 70 dBA	65 dBA	60 dBA
Sunrise Way					
- North of San Rafael Drive	7,650	72.3	78	237	745
- South of San Rafael Drive	14,340	75.0	141	439	1,387
- North of Racquet Club Road	15,340	75.3	151	471	1,486
- South of Racquet Club Road	13,470	74.7	132	410	1,295
- North of Via Escuela	13,770	74.8	135	420	1,325
- South of Via Escuela	15,140	75.2	147	460	1,453
- North of Vista Chino	16,240	75.6	161	504	1,593
- South of Vista Chino	20,650	76.6	202	634	2,005
Farrell Drive					
- North of Racquet Club Road	1,730	57.2	R/W	R/W	R/W
- South of Racquet Club Road	11,020	73.6	108	338	1,069
- North of Via Escuela	10,900	73.6	108	338	1,069
- South of Via Escuela	11,230	73.7	111	346	1,094
- North of Vista Chino	11,370	73.7	111	346	1,094
- South of Vista Chino	17,620	75.6	170	536	1,694
Whitewater Club Drive					
- North of Via Escuela	1,530	56.7	R/W	R/W	R/W
- South of Via Escuela	930	54.5	R/W	R/W	R/W
- North of Vista Chino	1,050	55.0	R/W	R/W	R/W
Gene Autry Trail					
- North of Via Escuela	34,580	80.2	460	1,453	4,593
- South of Via Escuela	32,200	79.9	429	1,356	4,287
San Rafael Drive					
- West of Sunrise Way	7,910	68.5	R/W	106	331
- East of Sunrise Way	1,720	57.2	R/W	R/W	R/W
Racquet Club Road					
- West of Sunrise Way	8,960	69.1	R/W	121	380
- East of Sunrise Way	10,800	69.9	49	145	456
- West of Farrell Drive	10,170	69.6	46	136	426
Via Escuela					
- West of Sunrise Way	2,570	58.9	R/W	R/W	39
- East of Sunrise Way	2,860	59.4	R/W	R/W	44
- West of Farrell Drive	2,910	59.5	R/W	R/W	45
- East of Farrell Drive	6,100	62.7	R/W	30	93
- West of Whitewater Club Dr.	4,330	61.2	R/W	R/W	66
- East of Whitewater Club Dr.	6,460	62.9	R/W	31	97
- West of Gene Autry Trail	6,040	62.7	R/W	30	93
- East of Gene Autry Trail	660	53.0	R/W	R/W	R/W
Vista Chino					
- West of Sunrise Way	22,130	77.3	217	680	2,148
- East of Sunrise Way	25,180	77.9	248	781	2,467
- West of Farrell Drive	31,030	78.8	305	960	3,034
- East of Farrell Drive	40,070	80.6	460	1,453	4,593
- West of Whitewater Club Dr.	41,430	80.3	471	1,486	4,700
- East of Whitewater Club Dr.	42,400	80.4	482	1,521	4,810

a. A.D.T. = average daily two-way traffic volume.
b. CNEL is provided at 50 feet from all roadway centerlines .
c. All distances are measured from the centerline. R/W means the contour falls within the right-of-way.

Appendix D
Year 2030 Ambient Exterior Noise Exposure

Roadway Segment	A.D.T.[a] (Veh/Day)	CNEL @ 50 Feet[b]	Distance to Contours (Ft.)[c] 70 dBA	65 dBA	60 dBA
Sunrise Way					
- North of San Rafael Drive	7,650	72.3	78	237	745
- South of San Rafael Drive	14,340	75.0	141	439	1,387
- North of Racquet Club Road	15,340	75.3	151	471	1,486
- South of Racquet Club Road	13,470	74.7	132	410	1,295
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- South of Via Escuela	15,140	75.2	147	460	1,453
- North of Vista Chino	16,240	75.6	161	504	1,593
- South of Vista Chino	20,650	76.6	202	634	2,005
Farrell Drive					
- North of Racquet Club Road	1,730	57.2	R/W	R/W	R/W
- South of Racquet Club Road	11,020	73.6	108	338	1,069
- North of Via Escuela	10,900	73.6	108	338	1,069
- South of Via Escuela	11,230	73.7	111	346	1,094
- North of Vista Chino	11,370	73.7	111	346	1,094
- South of Vista Chino	17,620	75.6	170	536	1,694
Whitewater Club Drive					
- North of Via Escuela	1,530	56.7	R/W	R/W	R/W
- South of Via Escuela	930	54.5	R/W	R/W	R/W
- North of Vista Chino	1,050	55.0	R/W	R/W	R/W
Gene Autry Trail					
- North of Via Escuela	34,580	80.2	460	1,453	4,593
- South of Via Escuela	32,200	79.9	429	1,356	4,287
San Rafael Drive					
- West of Sunrise Way	7,910	68.5	R/W	106	331
- East of Sunrise Way	1,720	57.2	R/W	R/W	R/W
Racquet Club Road					
- West of Sunrise Way	8,960	69.1	R/W	121	380
- East of Sunrise Way	10,800	69.9	49	145	456
- West of Farrell Drive	10,170	69.6	46	136	426
Via Escuela					
- West of Sunrise Way	2,570	58.9	R/W	R/W	39
- East of Sunrise Way	2,860	59.4	R/W	R/W	44
- West of Farrell Drive	2,910	59.5	R/W	R/W	45
- East of Farrell Drive	6,100	62.7	R/W	30	93
- West of Whitewater Club Dr.	4,330	61.2	R/W	R/W	66
- East of Whitewater Club Dr.	6,460	62.9	R/W	31	97
- West of Gene Autry Trail	6,040	62.7	R/W	30	93
- East of Gene Autry Trail	660	53.0	R/W	R/W	R/W
Vista Chino					
- West of Sunrise Way	22,130	77.3	217	680	2,148
- East of Sunrise Way	25,180	77.9	248	781	2,467
- West of Farrell Drive	31,030	78.8	305	960	3,034
- East of Farrell Drive	40,070	80.6	460	1,453	4,593
- West of Whitewater Club Dr.	41,430	80.3	471	1,486	4,700
- East of Whitewater Club Dr.	42,400	80.4	482	1,521	4,810

a. A.D.T. = average daily two-way traffic volume.
b. CNEL is provided at 50 feet from all roadway centerlines .
c. All distances are measured from the centerline. R/W means the contour falls within the right-of-way.