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NOISE ELEMENT

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PURPOSE

Rancho Mirage generally enjoys a quiet noise environment, with existing community noise being dominated by highway and local traffic, intermittent aircraft flyovers, and commercial operations. The Noise Element is intended to help coordinate the community's various land uses with the existing and future noise environment and to ensure that any negative effects of noise are minimized or completely avoided. Low noise levels are considered to be a major economic asset of the City's resort residential nature. As development continues, the City shall carefully review proposals to ensure that land uses incompatible with the noise environment are avoided. It is the purpose of this Element to identify noise problems within the City and its Sphere of Influence and to minimize future noise impacts resulting from continued growth.

BACKGROUND

Concern regarding the potential psychological and physiological impacts of noise has increased significantly in recent years. Excessive noise levels are not only a potential annoyance but can constitute a significant health threat resulting in temporary or permanent hearing loss and mental distress. The noise environment can also have a profound influence on the quality of life enjoyed by residents and visitors.

Understanding Noise

The principal characteristics of sound are its loudness (amplitude) and frequency (pitch). The frequency of a sound is significant because the human ear is not equally sensitive to all frequencies. At low frequencies, characterized as a rumble or roar, the ear is not very sensitive while at higher frequencies, characterized as a screech or a whine, the ear is most sensitive. To reflect this varying sensitivity, an A-weighted decibel scale (dBA) is typically used to measure the perceived loudness of a sound.

Noise refers to sound pressure variations audible to the ear. The audibility of a sound depends on the amplitude and frequency of the sound and the individual's capability to hear the sound. Whether the sound is judged as noise depends largely on the listener's current activity and attitude toward the sound source, as well as the amplitude and frequency of the sound. To obtain convenient measurements and sensitivities at extremely low and high sound pressures, sound is measured in units of the decibel (dB). A listener often judges an increase in sound levels of 10 dBA as a doubling of sound. Examples of the decibel level of various noise sources are shown in Exhibit VII-1.

Ranges and Effects of Noise

The most common sounds vary between 40 dBA (very quiet) and 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud engine noises equate to 110 dBA, which can cause serious discomfort. Physical health, psychological well being, social cohesion, property values, and economic productivity can all be affected by excessive amounts of noise.



Noise Terminology

dB (Decibel) – The unit of measure that denotes the ratio between two quantities that are proportional to power; the number of decibels corresponding to the ratio of the two amounts of power is based on a logarithmic scale.

dBA (A-weighted decibel) – The A-weighted decibel scale discriminates against upper and lower frequencies in a manner approximating the sensitivity of the human ear. The scale ranges from zero for the least perceptible sound to about 130 for the pain level.

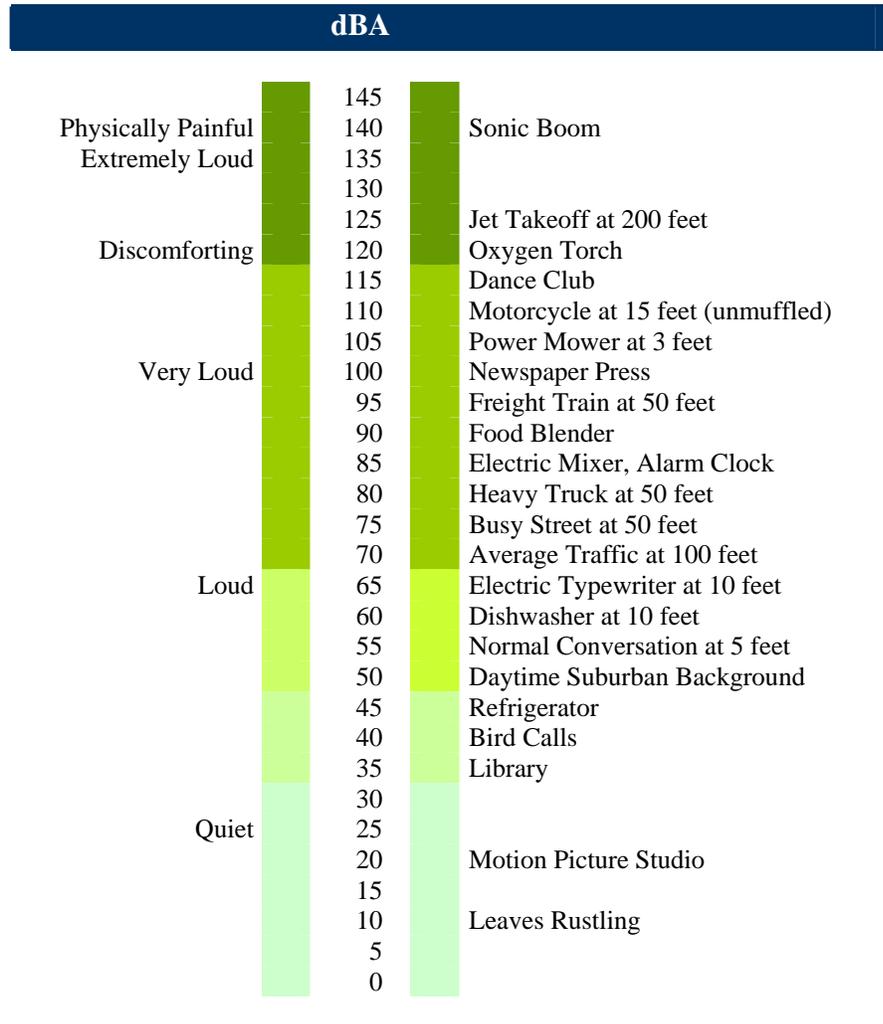
CNEL (Community Noise Equivalent Level) – The average equivalent A-weighted sound level during a 24-hour day, obtained after the addition of five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 decibels to sound levels in the night from 10:00 p.m. to 7:00 a.m. CNEL and Ldn are the metrics used in this document to describe annoyance due to noise and to establish land use planning criteria for noise.

L50 – The A-weighted sound level that is exceeded 50 percent of the sample time. Alternatively, the A-weighted sound level that is exceeded 30 minutes in a 60-minute period (similarly, L10, L25, etc.). These values are typically used to demonstrate compliance with noise restrictions included in the City noise ordinance.

Leq (Equivalent Energy Level) – The average acoustic energy content of noise during the time it lasts. The Leq of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure, no matter what time of day they occur.

Ldn (Day-Night Average Level) – The average equivalent A-weighted sound level during a 24-hour day, obtained after the addition of 10 decibels to sound levels in the night from 10:00 p.m. to 7:00 a.m. *Note:* CNEL and Ldn represent daily levels of noise exposure averaged on an annual or daily basis, while Leq represents the equivalent energy noise exposure for a shorter time period, typically one hour. CNEL and Ldn are the metrics used in this document to describe annoyance due to noise and to establish land use planning criteria for noise.

Exhibit VII-1 Noise Levels of Familiar Sources



The effects of noise on people can be grouped into three general categories: subjective effects, such as annoyance and nuisance; interference with activities such as conversation and sleep; and physiological effects, for example, a startle or hearing loss. Adverse reactions to noise generally increase with an increase in the difference between background or ambient noise and the noise generated from a particularly intrusive source such as a barking dog, traffic, aircraft or industrial operations. In most situations, noise control measures must reduce noise by 5 to 10 dBA in order to effectively lower the perceived sound. Therefore, loud, short duration noises from barking dogs and low flying aircraft generally have little impact upon the Community Noise Equivalent Level (CNEL) levels of an area, due to the CNEL being a 24-hour weighted average of noise levels.

Existing Community Noise Environment

In the City of Rancho Mirage, the primary source of noise, as in most Coachella Valley communities, is a consequence of motor vehicle traffic. To a lesser but occasionally substantial degree, aircraft traffic also contributes an intrusive element to the noise environment. The Interstate 10/Southern Pacific Railroad corridor has a substantial impact on the northern portion of the City and the Sphere of Influence. Other sources of community noise include mechanical equipment serving commercial land uses, resorts, and major institutions.

Motor Vehicle Noise

The principle noise source measured within the community is vehicular traffic, including automobiles, trucks, buses, and motorcycles. The level of noise generated by vehicular traffic generally varies according to the volume of traffic, the percentage of trucks, average traffic speed, and condition and composition of the roadway surface.

Interstate 10 and Southern Pacific Railroad Lines

In addition to traffic along Highway 111 and the other major arterial roadways impacting the City, both incorporated and Sphere of Influence areas of the City are impacted by rail and vehicular traffic associated with the Southern Pacific Railroad line and Interstate 10 (I-10). While the passage of trains is an intrusive noise event, it occurs only periodically and is limited in duration. The influence of traffic noise of I-10 is more significant and increases at night with persistent truck volumes.

Aircraft Noise

Aircraft noises impacting the community emanate from commercial and general aviation operations at the Palm Springs International Airport, located northwest and frequently directly upwind of the City. The Palm Springs Airport Master Plan and Part 150 Noise Compatibility Study evaluated airport operations, monitored portions of the noise environment, and projected future noise impacts from planned expansions and increased operations. Flight tracks or patterns aircraft are assumed to follow in the noise study indicate limited overflights in Rancho Mirage.

Stationary Noise Sources

In addition to noise generated by vehicular traffic and aircraft, there are stationary noise generators within the City that could create significant noise related conflicts. Acoustically unscreened operations such as loading and materials transfer for stores and businesses will raise issues of impact and compatibility. Another important source of potentially significant noise is from the operation of mechanical equipment, including chillers, refrigerator units and heating/air conditioner equipment associated with commercial centers. Noise from roof mounted equipment is especially effective at penetrating adjoining neighborhoods and impacting sensitive receptors. The constant hum associated with fans and compressors can impact the enjoyment of the outdoors and adversely affect the quality of life. Substantial progress has been made in noise analysis and mitigation through careful equipment design and ever improving baffling and noise cancellation technologies.



Noise Assessment and Modeling

To understand and evaluate the impacts of land use patterns, traffic, and individual developments on the noise environment, a variety of data has been collected, and existing and future impacts have been modeled. Projected noise contours for the City's roadways and freeways at buildout are presented in Exhibit VII-2.

Future noise impacts to the community are expected to be primarily generated by increasing traffic volumes. From the Circulation Element, we can extract the future volumes projected on major roadways. To make the projected traffic noise data more accurate, the average posted speed limits and a percentage mix of light and heavy truck traffic along the roadways are included in the modeling data. This information was supplied through City and CVAG traffic counts and counts prepared for General Plan traffic modeling. Computer modeling was used to estimate noise impacts and update the noise contour map due to the increased traffic volumes.

It is important to note that special attention to project specific site design may substantially reduce noise impacts below those projected; therefore, these estimates are considered to be conservative and unmitigated. A wide range of design criteria affecting roadway engineering and traffic noise abatement include differences in final grade between the roadbed and the top of walls, spacing of intersections, setbacks and parkway widths, roadway composition, and other considerations.

Managing the Noise Environment

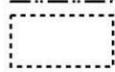
There are a variety of strategies available for managing the City's noise environment and preserving those qualities of peace and quiet that are essential and highly valued community assets. Land use planning, transportation planning, project design mitigation, and acoustical barriers can all be applied to address noise compatibility issues.

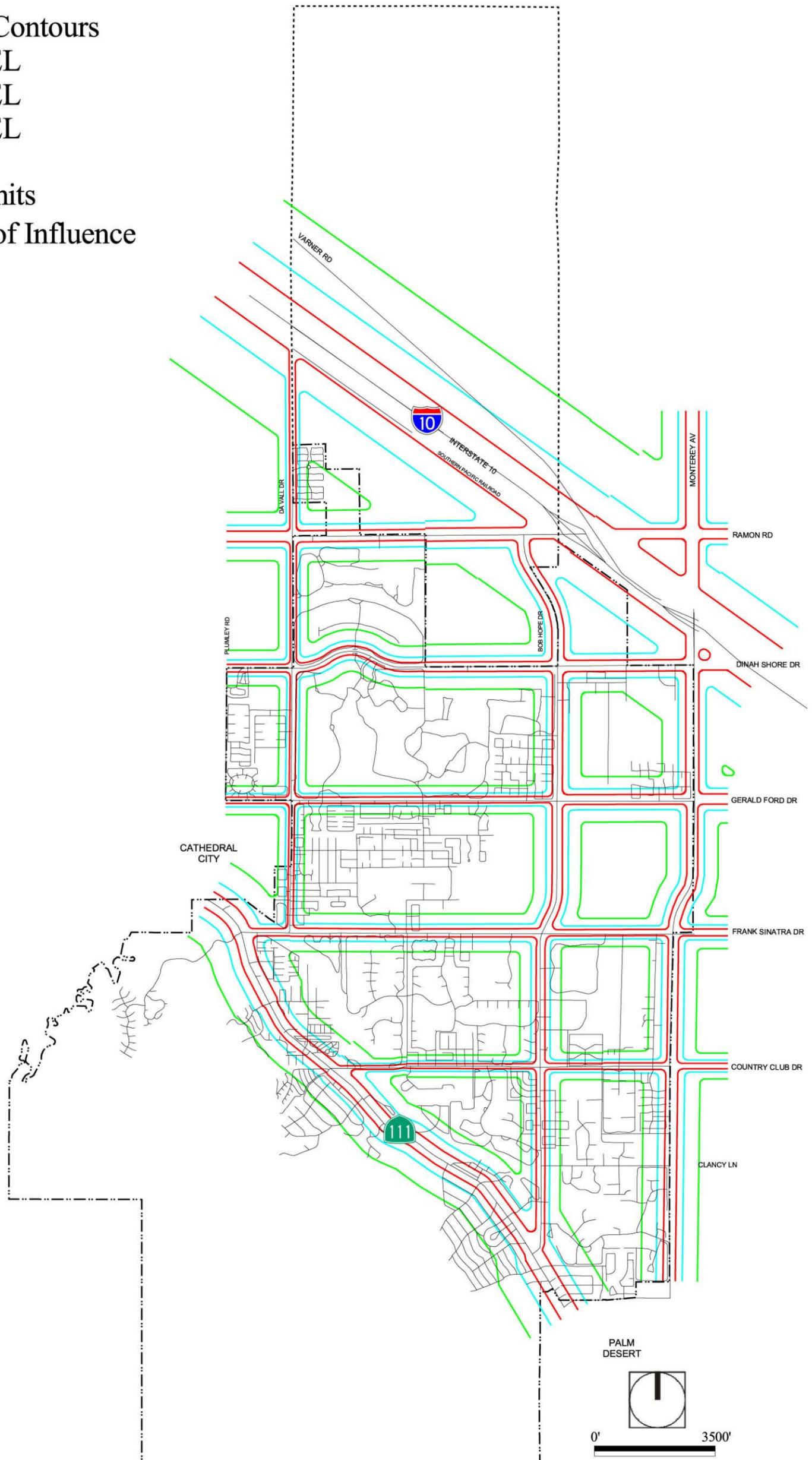
In areas subject to significant or potentially significant noise impacts, site planning and design standards are geared to provide direct and integrated noise impact mitigation. Applied mitigation measures include the use of buffer zones consisting of earthen berms, walls, and landscaping between sensitive land uses and roadways, and other noise sources. In addition, site planning and building orientation can provide shielding of outdoor living spaces and orient operable windows away from roadways. Effective acoustical materials can also be incorporated into building windows and walls that adequately reduce outdoor noise.

FUTURE ROADWAY CNEL NOISE CONTOURS

Future Noise Contours

-  60 CNEL
-  65 CNEL
-  70 CNEL

-  City Limits
-  Sphere of Influence



NOISE ELEMENT

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Rancho Mirage Noise Ordinance

The City’s Municipal Health and Safety Code sets forth standards, guidelines, and procedures concerning the regulation of noise in Rancho Mirage. Section 8.45 of the Municipal Code cites the value and importance given by residents, visitors, and businesses to the exceptional quality of life and peace and quiet of the community. The Rancho Mirage Noise Ordinance provides definitions of key terms and defines exterior noise level standards on a time-of-day basis along with adjustments for intensity and duration. The noise standards in the General Plan are intended to guide the location of future noise generators and sensitive land uses. The appropriate exterior noise standards are identified in Table VII-1 below. Interior noise standards are provided by State Noise Insulation Standards (California Administrative Code, Title 24), which requires residential structures to limit noise from exterior sources to 45 dBA in any habitable room.

**Table VII-1
Exterior Noise Limits**

Type of Land Use	Time Interval	CNEL (dBA)
Residential, Low Density	7:00 a.m. to 6:00 p.m.	55
	6:00 p.m. to 10:00 p.m.	50
	10:00 p.m. to 7:00 a.m.	45
Residential, Medium and High Density; Hospital; Open Space	7:00 a.m. to 6:00 p.m.	60
	6:00 p.m. to 10:00 p.m.	55
	10:00 p.m. to 7:00 a.m.	50
Commercial Office, Resort Commercial, Mixed Use, Institutional	7:00 a.m. to 6:00 p.m.	65
	6:00 p.m. to 10:00 p.m.	60
	10:00 p.m. to 7:00 a.m.	55
Commercial Neighborhood, General Commercial, Commercial Recreation	7:00 a.m. to 6:00 p.m.	70
	6:00 p.m. to 10:00 p.m.	65
	10:00 p.m. to 7:00 a.m.	60

Source: Rancho Mirage Noise Ordinance

Noise and Land Use Compatibility

In California, a CNEL of 65 dBA is used as a standard for maximum outdoor noise levels in residential areas. To assist the City in the planning of compatible uses, Table VII-2 illustrates a range of allowable exterior noise levels for various land uses. Particularly sensitive land uses include residences, schools, libraries, churches, hospitals and nursing homes, and destination resort areas. In addition, parks, golf courses, and other outdoor activity areas can be sensitive to noise disturbances. Less sensitive land uses include commercial uses, conventional hotels and motels, and playgrounds. Least sensitive to noise are heavy commercial uses, transportation, communication, and utility land uses.



**Table VII-2
Community Noise And Land Use Compatibility**

Land Uses Category	Community Noise Exposure Level Ldn or CNEL, dBA					
	55	60	65	70	75	80
Residential-Low Density Single-Family Dwellings, Duplex, and Mobile Homes	Normally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Residential Multi-family	Normally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Transient Lodging-Motels, Hotels	Normally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Schools, Libraries, Churches, Hospitals, Nursing Homes	Normally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Auditoriums, Concert Halls, Amphitheaters	Normally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Sports Arena, Outdoor Spectator Sports	Normally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Playgrounds, Neighborhood Parks	Normally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Golf Courses, Riding Stables, Water Recreation, Cemeteries	Normally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Office Buildings, Business, Commercial, Professional	Normally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Industrial, Manufacturing, Utilities, Agriculture	Normally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable

Explanatory Notes

-  **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 insulation features included in the design. Conventional construction, but with closed windows and fresh air supply system or air conditioning will normally suffice. Outdoor environment will seem noisy.

-  **Normally Unacceptable:**
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made with needed noise insulation features included in the design. Outdoor areas must be shielded.
-  **Clearly Unacceptable:**
New construction or development should generally not be undertaken. Construction cost to make the indoor environment acceptable would be prohibitive and the outdoor environment would not be usable.

Source: California Office of Noise Control

GOALS, POLICIES, AND PROGRAMS

Generally, the City of Rancho Mirage enjoys a quiet noise environment consistent with its character as a resort residential community. The City is, however, impacted by highway and major roadway noise sources. By following the policies and programs listed below, Rancho Mirage will ensure compatible development, protect noise sensitive land uses, and minimize the effects of excessive and nuisance noise. Future efforts should focus on the preservation of the peaceful and quiet atmosphere.

Existing and future noise abatement and mitigation will have varying levels of effectiveness, depending upon the noise type and its source, site conditions, geography, and land uses. Noise issues have been carefully considered in the development of the Land Use Element and Land Use Plan. Zoning designations provide another level of land use control. Designations assure appropriate uses near significant noise sources and development standards and guidelines that will reduce impacts and enhance compatibility. The Circulation Element has also been designed, where possible, to protect the City's residential areas from excessive traffic noise and to assure compatible noise levels.

GOAL 1

A noise environment providing peace and quiet that complements and is consistent with the City's resort residential character.

Policy 1

The potential of land use patterns, associated traffic and its distribution, and individual development shall be assessed for their potential to generate adverse and incompatible noise impacts. Significant impacts identified shall be appropriately mitigated.

Program 1.A

Expand the City's Noise Ordinance to include noise exposure thresholds triggering project-specific noise impact studies. Provide development standards and project design guidelines, which include a variety of mitigation measures that can be applied to meet City standards.

Program 1.B

Provide an outline of minimal requirements for noise studies for future development projects. Studies shall analyze project impacts and the effectiveness of proposed mitigation measures.

Policy 2

Noise sensitive land uses, including residences, resorts, community open space, schools, libraries, churches, hospitals, and convalescent homes shall be protected from high noise levels emitted by both existing and future noise sources.

Program 2.A

On a project-specific basis, apply noise mitigating site planning and require the installation of soundwalls, earthen berms, wall and window noise insulation, and/or other mitigation measures in areas exceeding the City's noise limit standards.



Policy 3

Project designs shall be required to include measures that assure that interior noise levels for residential development do not exceed 45 dBA.

Program 3.A

In areas subject to potentially significant noise impacts, the City shall require new development, upon construction, to demonstrate compliance with all applicable noise level limits at project completion.

Policy 4

Land uses that are compatible with higher noise levels shall be encouraged to locate adjacent to the City's major arterial roads and highways or the Southern Pacific Railroad/I-10 corridor to maximize noise-related land use compatibility.

Policy 5

Develop and maintain a circulation plan that is consistent with the resort residential character of the City, avoids impacts to existing and planned sensitive receptors/uses, and provides fixed routes for existing and future truck traffic.

Program 5.A

Employ noise mitigation practices, as necessary, when designing future streets and highways, and when improvements occur along existing road segments. Mitigation measures should emphasize the establishment of natural buffers or setbacks between the arterial roadways and adjoining noise-sensitive areas.