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. Noise increases of less than 3 dBA are not noticeable to most people, and an increase in sound levels of 10 dBA is generally perceived as a doubling of sound. Examples of the decibel level of various noise sources are shown in Exhibit 17.

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 away is roughly at 60 dBA, and loud engine noises can be as loud as 110 dBA. The higher level 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.

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.

Community noise is generally measured using the Community Noise Equivalent Level (CNEL), which is a 24-hour weighted average noise level. Noise that is loud or has a short duration (e.g.,
barking dogs and low flying aircraft) may be disruptive, but generally has little impact upon the CNEL because it does not last long.

**Existing Community Noise Environment**

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

**Motor Vehicle Noise**

The principle noise source measured in 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.

**I-10 and Southern Pacific Railroad Lines**

In addition to traffic along Highway 111 and the other major arterial roadways, both the incorporated areas of Rancho Mirage and the SOI are impacted by rail and vehicular traffic associated with the Southern Pacific Railroad line and I-10. While trains passing provide intrusive noise events, this only occurs periodically and has a limited duration. The influence of traffic noise from I-10 is more significant and increases at night with the persistent volume of truck travel.

**Aircraft Noise**

Aircraft noise impacting the community emanates from commercial and general aviation operations at the Palm Springs International Airport, located northwest and frequently directly upwind of Rancho Mirage. 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, stationary noise generators in Rancho Mirage could create significant noise related conflicts. Acoustically unscreened operations such as loading and materials transfer for stores and businesses can 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. 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. Certain outdoor uses, such as concerts at the Rancho Mirage Amphitheater in Rancho Mirage Community Park and outdoor athletic events at Rancho Mirage High School, can also generate significant stationary noise.

**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 Rancho Mirage’s roadways and freeways at buildout are presented in Exhibit 18.

Future noise impacts to the community are expected to be primarily generated by increasing traffic volumes. The Circulation Element provides information from which future traffic volumes on major roadways can be extracted. 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 collected through City and Coachella Valley Association of Governments-conducted traffic counts and those specifically conducted for General Plan traffic modeling. Noise impacts were estimated using computer modeling and the noise contour map was updated to reflect the increased traffic volumes.
It is important to note that the placement of noise barriers and special attention to project-specific site design may substantially reduce noise to levels below what is shown on the contour maps. These maps are considered, therefore, to be conservative and should be used for screening purposes only. Design criteria potentially affecting roadway engineering and traffic noise 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

A variety of strategies are available for managing Rancho Mirage’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 acoustic 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 provide direct and integrated noise impact mitigation. Applied mitigation measures may include, but are not limited to, 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 shield outdoor living spaces and orient operable windows away from roadways. Effective acoustic materials can also be incorporated into building windows and walls that adequately reduce outdoor noise.

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 3. Interior noise standards are provided by State Noise Insulation Standards (California Administrative Code, Title 24), which require residential structures to limit noise from exterior sources to 45 dBA in any habitable room.

### Table 35 Exterior Noise Limits

<table>
<thead>
<tr>
<th>Type of Land Use</th>
<th>Time Interval</th>
<th>CNEL (dBA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential, low-density</td>
<td>7 am to 6 pm</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>6 pm to 10 pm</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>10 pm to 7 am</td>
<td>45</td>
</tr>
<tr>
<td>Residential, medium</td>
<td>7 am to 6 pm</td>
<td>60</td>
</tr>
<tr>
<td>and high-density Hospital</td>
<td>6 pm to 10 pm</td>
<td>55</td>
</tr>
<tr>
<td>Open space</td>
<td>10 pm to 7 am</td>
<td>50</td>
</tr>
<tr>
<td>Commercial office</td>
<td>7 am to 6 pm</td>
<td>65</td>
</tr>
<tr>
<td>Resort commercial</td>
<td>6 pm to 10 pm</td>
<td>60</td>
</tr>
<tr>
<td>Institutional</td>
<td>10 pm to 7 am</td>
<td>55</td>
</tr>
<tr>
<td>Commercial neighborhood</td>
<td>7 am to 6 pm</td>
<td>70</td>
</tr>
<tr>
<td>General commercial</td>
<td>6 pm to 10 pm</td>
<td>65</td>
</tr>
<tr>
<td>Commercial recreation</td>
<td>10 pm to 7 am</td>
<td>60</td>
</tr>
</tbody>
</table>

**Source:** Rancho Mirage Noise Ordinance

- **D (Decibel)** is a unit used to measure the intensity of a sound or the power level of an electrical signal by comparing it with a given level on a logarithmic scale; more generally, decibel indicates a degree of loudness.
- **dBA** (A-weighted decibel) is an expression of the relative loudness of sounds in air as perceived by the human ear.
- **CNEL (Community Noise Equivalent Level)** is a weighted average of noise level over time. CNEL is determined by taking the weighted sound level over 24 hours, plus 5 dBA to evening sound levels and 10 dBA to night levels to account for increased human sensitivity to noise during a time when most people sleep.
- **Leq (Equivalent Energy Level)** is the preferred method to describe sound levels that vary over time, resulting in a single decibel value that accounts for the total sound energy for a short time. CNEL and Leq are used in this document to describe annoyance due to noise and to establish land use planning criteria for noise.

Exhibit 19 Noise Terminology

**CNEL (Community Noise Equivalent Level)** is a weighted average of noise level over time. CNEL is determined by taking the weighted sound level over 24 hours, plus 5 dBA to evening sound levels and 10 dBA to night levels to account for increased human sensitivity to noise during a time when most people sleep.

**Leq (Equivalent Energy Level)** is the preferred method to describe sound levels that vary over time, resulting in a single decibel value that accounts for the total sound energy for a short time.
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 compatible uses, a range of exterior noise thresholds for various land uses have been developed and are provided in Exhibit 20. 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.

Noise Goals, Policies, and Programs

Generally, Rancho Mirage enjoys a quiet noise environment consistent with the city’s character as a resort residential community. The city is impacted, however, 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 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 N 1

A noise environment providing peace and quiet that complements and is consistent with Rancho Mirage’s resort residential character.
**POLICY N 1.3**

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

**PROGRAM N 1.3.A**

In areas subject to exterior noise levels exceeding 65 dBA CNEL, the City shall require new residential development, upon construction, to demonstrate compliance with all applicable noise level limits at project completion.

**POLICY N 1.4**

Land uses allowed adjacent to Rancho Mirage’s major arterial roads and highways, or the Southern Pacific Railroad/I-10 corridor, should generally be limited to those that are compatible with higher noise levels to maximize noise-related land use compatibility.

**POLICY N 1.5**

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

**PROGRAM N 1.5.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.

A quiet setting in a planned residential community.