

3.11 NOISE

3.11.1 SETTING

Noise Measurement

Noise is defined as unwanted sound. Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. Sound levels are usually measured and expressed in decibels (dB), with 0 dB corresponding roughly to the threshold of hearing. The method commonly used to quantify environmental sounds consists of evaluating all of the frequencies of a sound in accordance with a weighting factor that reflects the facts that human hearing is less sensitive at low frequencies and extreme high frequencies than in the mid-range frequencies. This is called “A” weighting, and the decibel level so measured is called the A-weighted sound level (dBA). To describe the time-varying character of environmental noise, the statistical noise descriptors L_{10} , L_{50} , and L_{90} are commonly used. They are the A-weighted noise levels equaled or exceeded during 10 percent, 50 percent and 90 percent of a stated time period. A single number descriptor called L_{eq} is now also widely used. The L_{eq} is the average A-weighted noise level during a stated time period. In determining the daily level of environmental noise, it is important to account for the difference in response of people to daytime and nighttime noises. During the nighttime, exterior background noises are generally lower than the daytime levels. However, most household noise also decreases at night, and exterior noise becomes very noticeable. Further, most people sleep at night and are very sensitive to noise intrusion. To account for human sensitivity to nighttime noise levels, the descriptor L_{dn} (day/night average sound level) was developed. The L_{dn} divides the 24-hour day into the daytime of 7:00 AM to 10:00 PM and the nighttime of 10:00 PM to 7:00 AM. The nighttime noise level is weighted 10 dB higher than the daytime noise level. The Community Noise Equivalent Level (CNEL) is another 24-hour average which includes both an evening and nighttime weighting.

With regard to increases in A-weighted noise levels, knowledge of the following relationships will be helpful:

Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived.

- Outside of the laboratory, a 3 dB change is considered a just perceivable difference.
- A change in level of at least 5 dB is required before any noticeable change in community response would be expected.
- A 10 dB change is subjectively heard as approximately a doubling in loudness, and would almost certainly cause an adverse change in community response.

Existing Noise Environment

Ambient noise levels vary throughout the Monterey Bay region, and differ between urban and rural settings. Noise sources are primarily associated with transportation facilities, with noise in the vicinity of major roadways, airports and railroads frequently exceeding health and welfare criteria for noise exposure for sensitive land uses in urban areas. Sensitive land uses include residences, hotels/motels and other forms of transient lodging, schools, libraries, churches, hospitals and nursing homes.

The primary factors that determine roadway noise levels are the local traffic volume, the percentage of trucks and buses, average vehicle speed and the presence of natural or man-made noise attenuation features such as soundwalls and landscaping. Noise levels immediately adjacent to freeways may exceed an L_{dn} of 80 dB, while noise levels along major arteries are typically between an L_{dn} of 65 and 70 dB. An increase in traffic volumes means a comparable increase in sound energy. For example, ten times as many vehicles per hour means ten times as much sound energy, resulting in a 10 dB increase and a perceived doubling of loudness.

Noise associated with railroad operations is caused by diesel engines, switching operations and whistles. Generally, trains operate at low speeds through urban areas as a safety precaution, and noise levels are correspondingly lower at lower speeds. Switching operations usually occur at stations or depots. Whistles are blown in advance of grade crossings.

Noise associated with airport operations is caused by flyovers, takeoffs and landing from air carrier, business and military aircraft operations. Noise levels exceeding 75 dB are experienced beneath the flight paths of commercial airports.

Regulatory Background

Federal, state and local regulations and ordinances define objectionable noise levels and identify land use compatibility noise standards. The California Department of Transportation (Caltrans) has developed noise abatement criteria which attempt to balance noise levels between that which may be desirable for various land uses and that which may be achievable. According to Caltrans guidelines, a substantial noise level increase occurs when the predicted design year exterior noise levels reach 65 dB and exceed ambient noise levels by 12 dB.

The Federal Highway Administration (FHWA) guidelines identify a significant noise increase when exterior traffic noise levels exceed 67 dB for sensitive noise receptors in picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries and hospitals, and 72 dB for commercial receptors in other developed areas. Exceedance of these guidelines generally indicates the need for sound attenuation to reduce noise levels for sensitive land uses. Typical sound attenuation devices used by these agencies include sound barriers.

Each of the three counties within the region, and the cities within those counties, have adopted noise elements in their General Plans. Typically, residential uses are considered to be compatible with exterior L_{dn} noise levels of up to 60 dB, while office and commercial land uses are considered compatible with exterior L_{dn} noise levels of up to 75 dB. Exterior noise levels above an L_{dn} of 80 dB are generally unacceptable. Interior noise levels are generally recommended to be below an L_{dn} of 45 dB in residential development. In fact, interior noise levels are mandated by California law to be below an L_{dn} of 45 dB in new multi-family housing projects, including hotels and motels. In addition, many of the noise elements have programs which require that all projects which have the potential for creating increased noise levels be studied, and mitigation identified to minimize noise impacts.

For light rail and commuter projects, the applicable guidelines are those of the Federal Transit Administrative (FTA) and the American Public Transit Association (APTA). The APTA guidelines are not mandatory, but are frequently applied in the design and engineering of transit facilities.

3.11.2 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Implementation of the three plans could have a significant environmental impact if it were to result in:

- Exposure of persons to (or generation of) noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Exposure of persons to (or generation of) excessive groundborne noise levels;
- Exposure of persons to (or generation of) excessive groundborne vibration;
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- Development located in an area covered by an airport land use plan (or, where such a plan has not been adopted, within two miles of a public airport or public use airport), if it would result in exposure of people residing or working in the project area to excessive noise levels;
or
- Development within the vicinity of a private airstrip, if it would result in exposure of people residing or working in the project area to excessive noise levels.

Traffic Noise

Although the adoption the three plans would not, in and of itself, entail any noise impacts, the completion of roadway extensions or widenings, and the construction of new roadways identified in the financially constrained Action Elements of the three plans could have the potential for creating noise impacts, not only along the new alignments, but also along streets connecting to those alignments.

IMPACT 3.11.1: Increased Noise Related to Increased Traffic Volumes. Major roadway widenings which increase capacity, or transportation system improvements which create new roadways in previously unaffected areas, may permanently affect ambient noise levels by substantially increasing traffic volumes, possibly exceeding established standards for noise exposure. This could represent a **potentially significant environmental impact** associated with these types of projects.

RECOMMENDED MITIGATION MEASURE

MITIGATION MEASURE 3.11.1: Acoustical Analysis/Site-Specific Mitigation

A. Acoustical analyses shall, where appropriate, be conducted by the implementing agency as part of new roadway construction and/or widening projects for existing roads. The noise study shall, where appropriate, identify existing noise sensitive receptors, determine existing ambient noise levels, project future noise levels, make appropriate findings with respect to appropriate criteria, and recommend mitigation/abatement measures. Specific noise mitigation or abatement measures to be considered include alternative alignments, sound barrier walls and earthen berms where space is available. Determination of appropriate noise attenuation or abatement measures shall, where appropriate, be assessed on a case-by-case basis pursuant to the regulations of the applicable agency.

B. Various sound attenuation techniques shall, where appropriate, be considered where transportation system improvement projects are found to expose sensitive receptors to noise exceeding normally acceptable levels. The preferred methods for mitigating noise impacts will be the use of appropriate setbacks and sound attenuating building design, including retrofit of existing structures with sound attenuating building materials, where feasible. In instances where the use of these techniques is not feasible, the use of sound barriers (earthen berms, sound walls, or some combination of the two) will be considered. Determination of appropriate noise attenuation measures will be assessed on a case-by-case basis during a project's individual environmental review pursuant to the regulations of the applicable agency.

RESULTING LEVEL OF SIGNIFICANCE

Although noise mitigation or abatement measures may be expected to reduce potential traffic noise impacts to a level of less than significant in most instances, this impact may not be mitigable in a few cases, resulting in an environmental impact that could remain **significant and unavoidable**.

Rail Noise

Rail-related projects identified in the financially constrained Action Elements of the three plans may also have the potential to significantly increase noise levels along their alignments.

IMPACT 3.11.2: Increased Noise Levels along Rail Corridors. Expansion of existing rail service and related facilities associated with the financially constrained Action Elements of the three plans may increase ambient noise levels along rail service corridors, possibly exceeding established standards for noise exposure. This could represent a **potentially significant environmental impact** associated with this type of project.

RECOMMENDED MITIGATION MEASURE

MITIGATION MEASURE 3.11.2: Acoustical Analysis/Site-Specific Mitigation

A. Where appropriate and feasible, a Community Quiet Zone should be pursued with appropriate crossing devices to decrease the use of train crossing horns. Designation of the Quiet Zone is made by the Federal Railroad Administration, in coordination with the Public Utilities Commission.

B. Acoustical analyses shall, where appropriate, be conducted by the implementing agency as part of future rail service and facilities expansion projects. If future noise levels exceed the applicable federal, state or local noise impact criteria, appropriate noise barriers such as berms, noise walls, and/or landscaping or attenuation measures for homes such as double-paned windows or other sound insulating techniques shall, where appropriate, be installed as necessary to reduce exterior noise levels to acceptable levels, and to meet state standards for residential interior noise levels.

C. If proposed rail projects are located adjacent to sensitive uses, the implementing agency shall, where appropriate, ensure that a vibration survey and assessment is conducted to determine alternative alignments which allow greater distance from the rail or other vibration isolation techniques, as necessary, to assess the effects and mitigate any potential adverse effects.

RESULTING LEVEL OF SIGNIFICANCE

Use of noise mitigation or abatement measures may be expected to reduce potential rail-related noise and vibration impacts to a level of less than significant in most instances. However, these impacts may not be mitigable in a few cases, resulting in environmental impacts that could remain **significant and unavoidable**.

Transit-Related Noise

Projects that would increase the number of buses or other transit vehicles used by transit providers, or that would expand existing transit routes, would result in increased bus trips and/or trip lengths, and a corresponding increase in noise along roadways supporting transit operations. However, the

reduction in traffic noise that would occur as a result of the associated reduction in vehicle trips would more than offset this transit-related noise increase. Therefore, transit projects would be expected to result in an overall noise reduction when compared to existing conditions.

Aviation Noise

Airport improvements identified in the three plans could be expected to facilitate increased air traffic in the future. However, despite increased flight traffic, overall noise levels on and near airports within the region would not be expected to decline over time, due to the introduction of newer, quieter aircraft. Because an increase in noise levels is not anticipated, no significant impacts due to aircraft operations would be anticipated.

Construction Noise

Construction activity associated with the implementation of transportation system improvement projects identified in the financially constrained Action Elements of the three plans could create temporary noise impacts.

IMPACT 3.11.3: Construction-Related Noise. Construction activity associated with some of the projects identified in the financially constrained Action Elements of the three plans could temporarily result in noise levels which might exceed established standards for noise exposure. Examples of projects which might involve such impacts may include (but are not necessarily limited to) the construction of new roadways, the widening of existing roadways, rail improvements on rail lines that are not currently used by trains, new transit stations, bridge improvements and the construction of other transportation system improvement infrastructure. This could represent a **potentially significant environmental impact** associated with those projects which involve construction activity.

RECOMMENDED MITIGATION MEASURE

MITIGATION MEASURE 3.11.3: Noise Abatement

In order to reduce potential construction-related noise impacts, the implementing agency shall, where appropriate, ensure that, where residences or other noise sensitive uses are located adjacent to construction sites, appropriate measures shall be implemented, where appropriate, to ensure consistency with local noise ordinance requirements relating to construction activity. Specific techniques may include (but are not limited to) restrictions on construction timing, the use of sound blankets on construction equipment, and the use of temporary noise walls and noise barriers to block and deflect noise. All construction equipment in active use at project sites should be appropriately muffled and properly maintained. Limiting truck access routes and establishing maximum allowable noise limits for construction equipment should also be considered as measures which would reduce construction-related noise at specific sites.

RESULTING LEVEL OF SIGNIFICANCE

These noise abatement measures could generally be expected to reduce construction-related noise impacts to a level of less than significant.

Groundborne Noise/Vibration

Certain construction activities associated with specific types of transportation system improvement projects may also entail significant noise and/or vibration impacts.

IMPACT 3.11.4: Exposure to Excessive Groundborne Noise/Vibration. Construction associated with some of the transportation system improvement projects identified in the financially constrained Action Elements of the three plans might involve activities (such as pile-driving) which could result in the temporary exposure of persons living or working near the construction area to excessive groundborne noise and/or vibration during construction activity. Examples of projects which might involve such impacts may include (but are not necessarily limited to) bridge replacements and the construction of new transportation system improvement infrastructure, including on/off ramps and interchanges. This could represent a **potentially significant environmental impact** associated with these types of projects.

RECOMMENDED MITIGATION MEASURE

MITIGATION MEASURE 3.11.4: Restrictions on Construction Activities

In order to reduce the potential noise and/or vibration impacts associated with certain construction activities such as pile-driving, the implementing agency shall, where appropriate, ensure that, to the maximum extent feasible, all such activity which would take place in the vicinity of sensitive receptors be limited to the hours of 7:00 AM to 7:00 PM, Monday through Friday. If a particular project located adjacent to sensitive receptors requires pile driving, the local jurisdiction may require the use of pile driving techniques that would reduce physical impacts and associated noise generation from such activity.

RESULTING LEVEL OF SIGNIFICANCE

These restrictions could generally be expected to reduce noise and/or vibration impacts associated with such construction activity to a level of less than significant.

Airport Noise

Implementation of the projects identified in the financially constrained Action Elements of the three plans would not result in any new development within an area covered by an airport land use plan, within two miles of any airport, or within the vicinity of a private airstrip which would result in the exposure of people living or working within those areas to excessive noise levels.