

3.10 Noise

Environmental Setting

PHYSICAL SETTING

Noise Principles and Descriptors

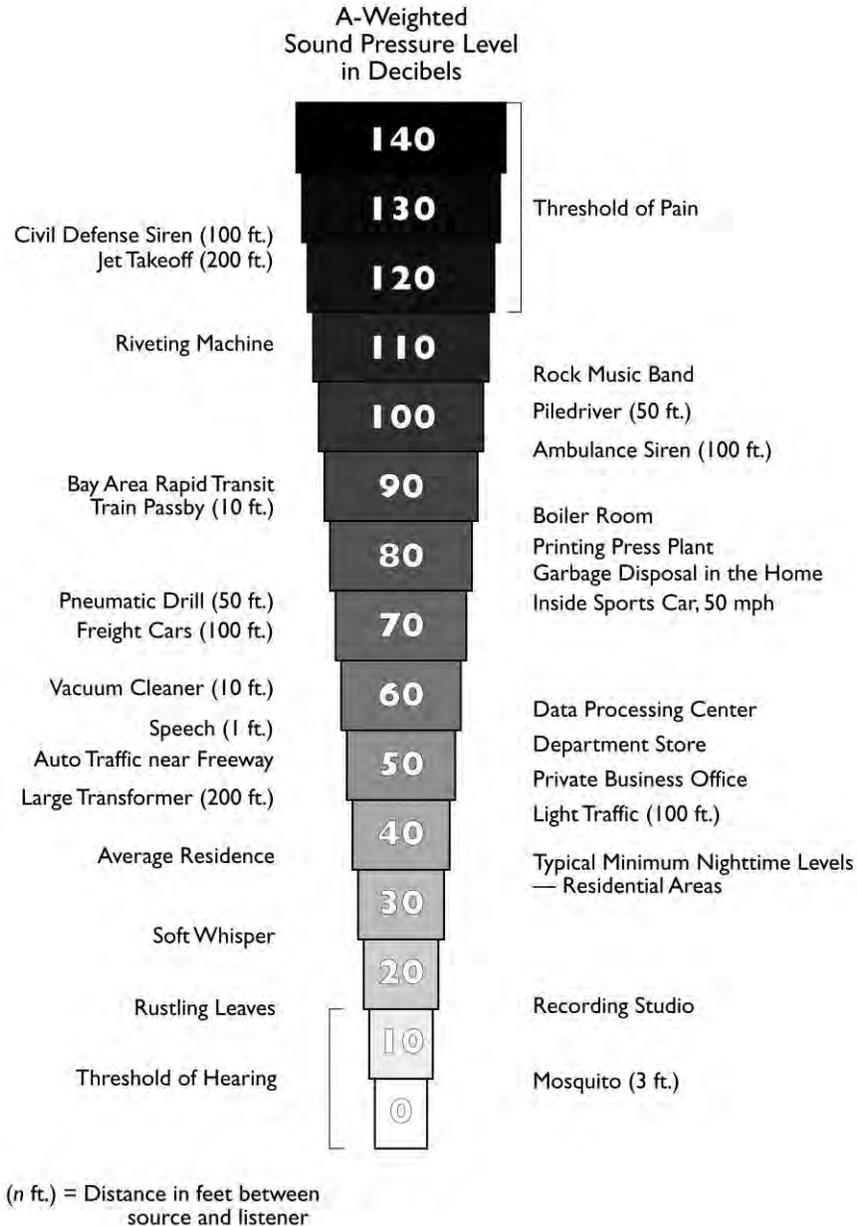
Introduction

Noise is defined as unwanted sound. Sound, traveling in the form of waves from a source, exerts a sound pressure level (referred to as sound level) which is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain. Pressure waves traveling through air exert a force registered by the human ear as sound.

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude (sound power). When all the audible frequencies of a sound are measured, a sound spectrum is plotted consisting of a range of frequency spanning 20 to 20,000 Hz. The sound pressure level, therefore, constitutes the additive force exerted by a sound corresponding to the sound frequency/sound power level spectrum.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ears decreased sensitivity to low and extremely high frequencies. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA). Frequency A-weighting follows an international standard methodology of frequency de-emphasis and is typically applied to community noise measurements. Some representative noise sources and their corresponding A-weighted noise levels are shown in Figure 3.10-1. For simplicity, all noise levels in this section use the “dB” symbol; however, all noise levels presented in this section are A-weighted.

Figure 3.10-1: Typical Sound Levels



Noise Exposure and Community Noise

An individual’s noise exposure is a measure of noise over a period of time. A noise level is a measure of noise at a given instant in time. The noise levels presented in Figure 3.10-1 are representative of measured noise at a given instant in time, however, they rarely persist consistently over a long period of time. Rather, community noise varies continuously over a period of time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with the individual contributors unidentifiable. The background noise level changes

throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources such as traffic and changes in atmospheric conditions. What makes community noise variable throughout a day, besides the slowly changing background noise, is the addition of short duration single-event noise sources (e.g., aircraft flyovers, trains, motor vehicles, sirens), which are readily identifiable to the individual. These temporary sources of noise may occur infrequently at any time, or recur on a short-term but repeating basis throughout the day or even during evening hours (such as noise associated with bus or train trips).

These successive additions of sound to the community noise environment varies the community noise level from instant to instant requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts. This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

- **L_{eq}**: the equivalent sound level is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The L_{eq} is the constant sound level which would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).
- **L_{max}**: the instantaneous maximum noise level for a specified period of time.
- **L₅₀**: the noise level that is equaled or exceeded 50 percent of the specified time period. The L₅₀ represents the median sound level.
- **L₉₀**: the noise level that is equaled or exceeded 90 percent of the specified time period. The L₉₀ is sometimes used to represent the background sound level.
- **L_{dn}**: the L_{dn} is the same as the DNL (below).
- **DNL**: The DNL is a 24-hour day and night A-weighted noise exposure level which accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night. Noise between 10:00 p.m. and 7:00 a.m. is weighted (penalized) by adding 10 dB to take into account the greater annoyance resulting from nighttime noises.
- **CNEL**: similar to the DNL, the Community Noise Equivalent Level (CNEL) adds a 5 dB “penalty” for the evening hours between 7:00 p.m. and 10:00 p.m. in addition to a 10 dB penalty between the hours of 10:00 p.m. and 7:00 a.m.
- **SEL**: Sound Exposure Level (SEL) is the energy-based sum of a given duration noise event squeezed into a reference duration of one second.

Cumulative noise descriptors, DNL and CNEL, are directly correlated with the likelihood of public annoyance from transportation noise sources. Individual noise events, such as train passbys, are further described using single-event noise descriptors. For single events, the maximum measured noise level (L_{max}) is often cited, as is SEL.

As a general rule, in areas where the noise environment is dominated by traffic, the L_{eq} during the peak-hour is generally equivalent (+/- 1 to 2 dB) to the DNL at that location.¹

Sound Propagation and Attenuation

Sound levels naturally decrease as one moves further away from the source. This basic attenuation rate is referred to as the geometric spreading loss. The basic rate of geometric spreading loss depends on whether a given noise source can be characterized as a point source or a line source.

Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate between 6 dB for “hard” sites and 7.5 dB for “soft sites” for each doubling of distance from the reference measurement. Hard sites are those with a reflective surface between the source and the receiver such as parking lots or smooth bodies of water. Soft sites have an absorptive ground surface such as soft dirt, grass, or scattered bushes and trees. In addition to geometric spreading, an excess ground attenuation value of 1.5 dB (per doubling of distance) is normally assumed for soft sites. Line sources (such as traffic noise from vehicles) attenuate at a rate between 3 dB for hard sites and 4.5 dB for soft sites for each doubling of distance from the reference measurement.²

Atmospheric effects, such as wind and temperature gradients, can also influence noise attenuation rates from both line and point sources of noise. However, unlike ground attenuation, atmospheric effects are constantly changing and are difficult to predict. Trees and vegetation, buildings, and barriers reduce the noise level that would otherwise occur at a given receptor distance. However, for trees or a vegetative strip to have a noticeable effect on noise levels, it must be dense and wide. For example, a stand of trees must be at least 100 feet wide and dense enough to completely obstruct a visual path to the roadway to attenuate traffic noise by 5 dB.³ A row of structures can shield more distant receivers depending upon the size and spacing of the intervening structures and the site geometry. Generally, for an at-grade highway in an average residential area where the first row of houses cover at least 40 percent of the total area, the reduction provided by the first row of houses is approximately 3 dB, and 1.5 dB for each additional row.⁴ Similar to vegetative strips discussed above, noise barriers, which include natural topography and soundwalls, reduce noise by blocking the line of sight between the source and receiver. Generally, a noise barrier that breaks the line of sight between source and receiver will provide at least a 5 dB reduction in noise.

Effects of Noise on People

Human reaction to noise ranges from annoyance, to interference with various activities, to hearing loss and stress-related health problems. The effects of noise on people can be placed into three categories:

¹ California Department of Transportation. Technical Noise Supplement to the Traffic Noise Analysis Protocol, October, 1998.

² Ibid.

³ Ibid.

⁴ Ibid.

- Subjective effects of annoyance, nuisance, dissatisfaction;
- Interference with activities such as speech, sleep, learning; and
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no complete satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists, and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so called "ambient noise" level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur:

- 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 human response would be expected; and
- A 10 dB change is subjectively heard as approximately a doubling in loudness, and can cause adverse response.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. The human ear perceives sound in a non-linear fashion; hence the decibel scale was developed. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dB the combined sound level would be 53 dB, not 100 dB.

Sensitive Receptors

People in residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, natural areas, parks and outdoor recreation areas are generally more sensitive to noise than are people at commercial and industrial establishments. Consequently, the noise standards for sensitive land uses (sensitive receptors) are more stringent than for those at less sensitive uses.

Noise Sources in Daly City

As in most urban areas, transportation sources generate the bulk of noise in Daly City. Noise from roadways are the primary source of transportation noise in the city, but noise from aircraft departures from the San Francisco International Airport (SFO) and Bay Area Rapid Transit (BART) trains also contribute.

Roadway Noise

The city is exposed to noise generated by traffic on Interstate 280, Highway 1, and Highway 35. To a lesser extent, noise is also generated along major arterial roads such as Geneva Avenue, Mission

Street, John Daly Boulevard, Junipero Serra and Serramonte Boulevard. Traffic noise depends primarily on traffic speed (tire noise increases with speed) and the proportion of truck traffic (trucks generate engine, exhaust, and wind noise in addition to tire noise). Changes in traffic volumes can also have an impact on overall traffic noise levels. For example, a doubling of traffic volumes results in a 3 dB increase in noise levels. Existing roadway noise contours are shown in Figure 3.10-2.

Railway Noise

The city experiences impacts from rail noise generated by BART. Elevated BART tracks run parallel between Interstate 280 and Junipero Serra through the city. The BART tracks are elevated through the Daly City BART Station, at approximately 30 feet above grade. The BART tracks begin to run below grade at Westlake Avenue and then begin to run underground where Junipero and Interstate 280 cross. BART trains do not result in high noise levels when they are inside the tunnel or below grade. However, on the elevated tracks, north of Westlake Avenue, engine noise from accelerating trains and vibratory noise from elevated tracks result in relatively high train operations noise. Because the tracks are elevated, receptors to the east of the tracks, including residences are exposed to train noise without shielding. Maximum BART train noise was measured to range from the high 50s to the low 80s dBA (L_{max}).⁵

Aircraft Noise

The city is located northwest of SFO, and the southern portion of Daly City lies below the flight path of aircraft departures from SFO. The Federal Aviation Administration (FAA), the agency charged with ensuring air safety, mandates that most airports create computer-generated noise contour maps using the Integrated Noise Model program. The most recent FAA-approved noise contour maps are contained in the *2001 Noise Exposure Map Update* ('01 NEM), which includes 2001 baseline noise contours and projected 2006 noise contours. As of July 2012, SFO is currently in the process of updating the NEMs. After public comment, they will be submitted to the FAA for review and approval.⁶

Based on the FAA-approved NEMs, a small area in the southern portion of the city is located within the 65-70 dB noise contours. The southern portion of the city up to about Southgate and Mayfield avenues falls within the 60-65 dB noise contours, as shown in Figure 3.10-2. No part of the city is within 70+ noise contours.

REGULATORY SETTING

Federal Regulations

Generally, the federal government sets noise standards for transportation-related noise sources that are closely linked to interstate commerce, such as aircraft, locomotives, and trucks. For those noise sources, the state government is pre-empted from establishing more stringent standards.

⁵ City of Daly City, Peninsula Gateway Plaza Redevelopment Project, Draft Supplemental EIR, December 14, 1998.

⁶ Email correspondence with Bert Ganoung, Manager of Aircraft Noise Abatement at San Francisco International Airport, July 9, 2012.

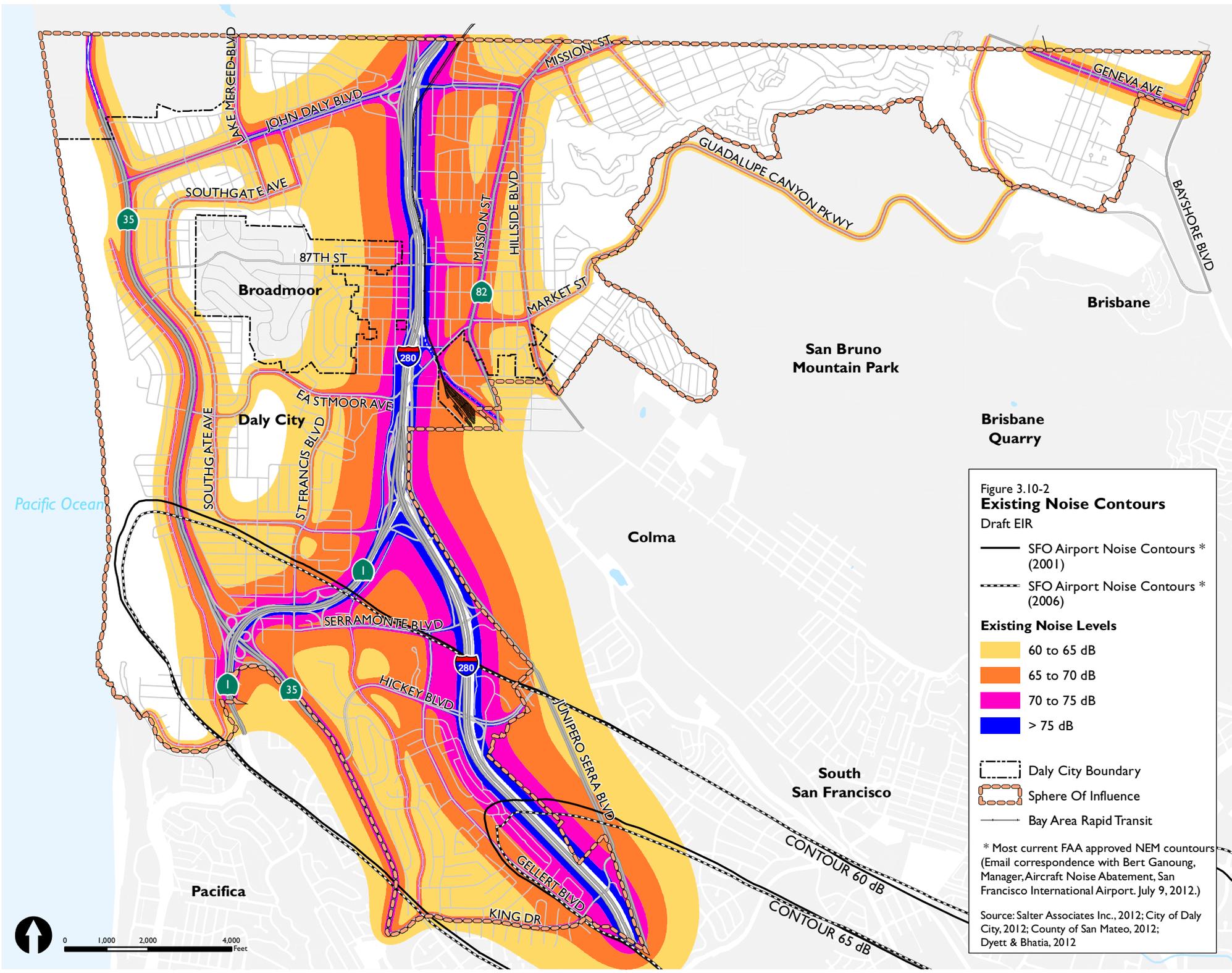


Figure 3.10-2
Existing Noise Contours
 Draft EIR

- SFO Airport Noise Contours * (2001)
- - - SFO Airport Noise Contours * (2006)

Existing Noise Levels

- 60 to 65 dB
- 65 to 70 dB
- 70 to 75 dB
- > 75 dB

- - - Daly City Boundary
- ⋯ Sphere Of Influence
- Bay Area Rapid Transit

* Most current FAA approved NEM countours (Email correspondence with Bert Ganoung, Manager, Aircraft Noise Abatement, San Francisco International Airport, July 9, 2012.)

Source: Salter Associates Inc., 2012; City of Daly City, 2012; County of San Mateo, 2012; Dyett & Bhatia, 2012



Federal Aviation Act of 1958

The Federal Aviation Act of 1958 created the Federal Aviation Agency. When the Agency became a part of the Department of Transportation in 1967, it adopted its present name of Federal Aviation Administration (FAA). Among other responsibilities, the FAA is in charge of developing and carrying out programs to control aircraft noise and other environmental effects of civil aviation.

Federal Aviation Administration's Airport Improvement Program

The Airport Improvement Program (AIP) provides grants to public agencies—and, in some cases, to private owners and entities—for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems (NPIAS). When airport owners or sponsors, planning agencies, or other organizations accept funds from FAA-administered airport financial assistance programs, they must agree to certain obligations (or assurances). These obligations require the recipients to maintain and operate their facilities safely and efficiently and in accordance with specified conditions. The assurances appear either in the application for Federal assistance and become part of the final grant offer or in restrictive covenants to property deeds. The duration of these obligations depends on the type of recipient, the useful life of the facility being developed, and other conditions stipulated in the assurances.

State Regulations

California Noise Control Act of 1973

The California Noise Control Act of 1973 established the State Office of Noise Control, which adopted Noise Compatibility Guidelines. These guidelines establish compatibility criteria for common land uses and are intended to ensure that new development proposals do not introduce excessive noise in a given location to the detriment of existing uses. Conversely, the guidelines also discourage introducing new uses to existing noise sources. For example, new residential construction in a location next to a busily traveled roadway exhibited unacceptably high existing noise levels may be allowed, but only with proper mitigation. The guidelines were first adopted by the City of Daly City in 1978.

Table 3.10-1 provides a matrix illustrating the compatibility of common land uses and a corresponding range of noise levels. A “compatible” land use indicates that standard construction methods will sufficiently attenuate exterior noise to an acceptable indoor noise level and people can carry out outdoor activities with essentially no noise interference. In general, evaluation of a land use that falls into the “conditionally compatible” noise environment should include consideration of the type of noise source, the sensitivity of the noise receptor, and the degree to which the noise source may interfere with speech, sleep, or other activities characteristic of the land use. Land uses which are normally acceptable may require the implementation of mitigation measures supported by detailed noise analyses. If the noise environment exceeds a certain criterion, new construction is prohibited.

California Noise Insulation Standards, California Code of Regulations, Title 24

The State has established noise insulation standards for new multi-family residential units, hotels, and motels that would be subject to relatively high levels of transportation-related noise. The noise insulation standards set forth an interior standard of DNL 45 dB in any habitable room. Where such units are proposed in areas subject to noise levels greater than DNL 60 dB, the Code requires an acoustical analysis to demonstrate that the dwelling units have been designed to meet the interior

noise standard. Title 24 standards are typically enforced by local jurisdictions through the building permit application process.

TABLE 3.10-1: NOISE AND LAND USE COMPATIBILITY MATRIX

Land Use Category	Community Noise Exposure - DNL (dBA)							
	50	55	60	65	70	75	80	
Residential – Low Density Single Family, Duplex, Mobile Home	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable
	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable
Residential – Multi-Family	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable
	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable
Transient Lodging – Motel/Hotel	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable
	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable
Schools, Libraries, Churches, Hospitals, Nursing Homes	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable
	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable
Auditorium, Concert Hall, Amphitheaters	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable
	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable
Sports Arena, Outdoor Spectator Sports	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable
	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable
Playgrounds, Neighborhood Parks	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable
	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable
Golf Courses, Riding Stables, Water Recreation, Cemeteries	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable
	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable
Office Buildings, Business, Commercial and Professional	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable
	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable
Industrial, Manufacturing, Utilities, Agriculture	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable
	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable

	<p>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.</p>
	<p>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 are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.</p>
	<p>Normally Unacceptable New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.</p>
	<p>Clearly Unacceptable New construction or development generally should not be undertaken.</p>

Source: State of California General Plan Guidelines, 2003

General Plan Consistency with Airport Land Use Compatibility Plans

Public Utilities Code 21675 requires each airport land use commission to formulate an airport land use compatibility plan. California Government Code 65302.3 further requires that general plans be consistent with airport land use compatibility plans. In addition, general plans and applicable specific plans must be amended to reflect amendments to the airport land use compatibility plan. The San Mateo County Comprehensive Airport Land Use Plan is discussed below.

Local Regulations

San Mateo County Comprehensive Airport Land Use Plan/San Francisco International Airport Comprehensive Airport Land Use Compatibility Plan

The San Mateo County Airport Land Use Commission develops and implements the Comprehensive Airport Land Use Plan (CLUP). In San Mateo County, the City/County Association of Governments of San Mateo County (C/CAG) is the designated Airport Land Use Commission. The current CLUP was adopted in 1996 and establishes the procedures that C/CAG uses in reviewing proposed local agency actions that affect land use decisions in the vicinity of airports in San Mateo County. Airport planning boundaries define where height, noise, and safety standards, policies, and criteria are applied to certain proposed land use policy actions. The CLUP is currently being updated with a new draft of the San Francisco International Airport Comprehensive Airport Land Use Compatibility (SFO ALUCP) section.

At the time of this EIR preparation, a July public review draft of SFO ALUCP update was available for review. The draft includes noise/land use compatibility criteria, safety compatibility criteria, as well as new noise contour maps that represent forecast conditions in 2020.

The Airport/Community Roundtable

The Airport/Community Roundtable is a voluntary committee of elected representatives from 45 municipalities near SFO, established in 1981 to address community noise impacts from aircraft operations at SFO. The Roundtable monitors a performance-based noise mitigation program implemented by airport staff, interprets community concerns and attempts to achieve noise mitigation through a cooperative sharing of authority among the aviation industry, the Federal Aviation Administration, SFO management, and local government.

Residential Sound Insulation Program

The home insulation program at SFO began in 1983, treating homes, churches, and schools in the County of San Mateo, Daly City, Millbrae, Pacifica, San Bruno and South San Francisco. The program is administered directly by the local jurisdictions but funded through a combination of FAA and airport funds distributed through the airport. FAA guidelines set the standard for eligibility for the use of federal funds to insulate residences; noise sensitive properties within the federally approved CNEL 65 dB annual noise contour are eligible.

Daly City Municipal Code

Title 9 – Public Peace, Morals and Welfare

Chapter 9.22 of the Daly City Municipal Code contains language to protect residents from excessive noise exposure. Section 9.22.010 prohibits an individual from causing a disturbance such that it disturbs the public peace off-site. Section 9.22.020 states that no person shall maintain, operate, or

conduct any loudspeaker or amplifier in such a manner as to cause the sound to be projected outside any building or out of doors in any part of the City without first obtaining a permit to do so. Section 9.22.030 deals more specifically with noise and states that between the hours of 10:00 p.m. and 6:00 a.m. no person shall cause, create, or permit any noise which may be heard beyond the confines of the property of origin. The Police Department enforces Chapter 9.22 of the Municipal Code.

Title 15 – Buildings and Construction

Section 15.00.130 requires any home, constructed after January 1, 1993 or renovated at a cost equal to twenty-five percent or more of the value of the home and located within the 65 CNEL (FAA approved) contour map that is illustrated on the Aircraft Noise Soundproofing Project Area Map, must be insulated to meet standards applied in noise insulation programs supported by the Federal Aviation Administration

Title 17- Zoning

Title 17 of the Daly City Municipal Code provides for discretionary review of projects through the use permit and variance process. An application for development is analyzed in light of many concerns including comparing the proposed use against the noise contours and Noise Compatibility Guidelines. The Planning Division attaches conditions of project approval to reduce noise impacts to future occupants of the proposed development as well as conditioning times construction activities may occur in order to reduce noise impacts to surrounding land uses.

Impact Analysis

SIGNIFICANCE CRITERIA

Implementation of the proposed General Plan would have a potentially significant impact if it would:

- Result in a substantial permanent increase in ambient noise levels (three dB or more) in the Planning area vicinity above acceptable noise levels, which would impact existing and anticipated sensitive receptors;
- Result in a substantial temporary or periodic increase in ambient noise levels above current levels;
- Result in the siting of noise-sensitive receptors in close proximity to major sources of transportation noise; or
- Expose persons to or generate excessive ground-borne vibration or ground-borne noise levels due to future development under the proposed General Plan.

METHODOLOGY AND ASSUMPTIONS

Noise impacts are assessed based on a comparative analysis of the noise levels resulting from the proposed General Plan and the noise levels under existing conditions. They are based on two criteria:

1. Noise level changes are analyzed to determine the overall increase or decrease in decibels. A change in noise levels of less than three dB is not discernible to the average person, while an increase in average noise levels of three dB is considered barely perceptible. An increase of five dB is considered readily perceptible to most people.⁷ Therefore, for evaluation of operational noise due to project-related traffic, an increase in noise of three dB over existing noise levels would be considered substantial and indicate a significant permanent increase in ambient noise levels.
2. Noise contours are analyzed to determine if sensitive receptors are exposed to noise levels above conditionally acceptable levels as presented in Table 3.10-1. If non-compatible noise contours intersect with a sensitive receptor as a result of project-related traffic, a significant impact would result.

Analysis of temporary construction noise effects is based on typical construction phases and equipment noise levels. Chapter 9.22 of the Daly City Municipal Code would also apply to construction in the city.

In establishing noise contours for land use planning, it is customary to ignore noise attenuation afforded by buildings, roadway elevations, and depressions, and to minimize the barrier effect of natural terrain features. The result is a worst-case estimate of the existing and future (projected) noise environment. The assumption is that it is more desirable to overestimate the potential noise at a future noise-sensitive development site than to underestimate the noise environment and allow for potentially incompatible land-use development.

Noise contours were developed by Charles M. Salter Associates using peak hour traffic volume data provided by Kittleson and Associates. Peak hour traffic volume data was projected for the year 2035 to maintain consistency with the Metropolitan Transportation Commission Travel Model and Forecasts. This future traffic condition is assumed to occur within the General Plan buildout year of 2030, which results in a conservative estimate of potential noise impacts.

For land use compatibility impacts, compatibility categories in the SFO ALUCP are applied to the proposed General Plan.

SUMMARY OF IMPACTS

Construction Noise Impacts

Ambient noise levels near areas of new development may temporarily increase due to construction activities. Future development under the proposed General Plan would be required to comply with the limitations on construction activity and associated noise standards included in Chapter 9.22 of the Daly City Municipal Code. Compliance with these provisions is mandatory and will ensure that construction noise impacts, while potentially a temporary nuisance, are less than significant.

⁷ Caltrans, California Department of Transportation. Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects, October, 1998.

Traffic Noise Impacts

A comparison of existing and future contours for the proposed General Plan show that traffic along Interstate 280, Highway 1, Highway 35, Geneva Avenue, Mission Street, and John Daly Boulevard, will continue to be major generators of noise in the city. Noise level increases on these roads are expected to be minimal, averaging less than 3 dB. Larger noise increases are anticipated along Junipero Serra Boulevard and Hickey Boulevard, resulting in a significant and unavoidable impact.

Airport Noise Impacts

A very small portion of the city in the south is currently located within the 65-70 dB CNEL, as shown in Figure 3.10-2, which maps the most recent FAA-approved noise contours. No portion of the city is located within the 70+ dB CNEL, where residential uses are prohibited.

Although a larger portion of the city is projected to be within the 65-70 dB CNEL in 2020, as shown in Figure 3.10-3, no part of the city is projected to be within the 70+ dB CNEL range. All land uses, with the exception of outdoor music shells and amphitheatres, are either allowed or conditionally allowed within the 65-70 dB CNEL. Land uses in the proposed General Plan will not conflict with the policies established in the SFO ALUCP, resulting in less than significant impacts. No private airstrips are located in the vicinity of the city; therefore no impact due to noise from private airstrips is expected.

Other Impacts

Given the limited potential for and temporary nature of ground-borne vibration in the city, the impact is less than significant.

IMPACTS AND MITIGATION MEASURES

Impact 3.10-1

Implementation of the proposed General Plan will result in a substantial permanent increase in ambient noise levels in the city vicinity above acceptable noise levels, which would impact existing and anticipated sensitive receptors. (*Significant and Unavoidable*)

In general, some land uses are impacted by noise more than others, with the most sensitive being residential and lodging uses. As shown in Table 3.10-1, noise levels below DNL 60-65 dB are ideal for residential or lodging uses, although if appropriate noise attenuation measures are taken, these uses can accept levels up to DNL 70 dB. Attenuation measures can include siting new sensitive receptors further away from the noise source, structural or natural sound barriers (i.e., sound walls or trees), or enhanced building insulation (i.e., sound-rated doors and windows, acoustic baffling, etc.).

Roadway Noise

The proposed General Plan is expected to result in increased roadway traffic noise levels in numerous areas, as shown in Table 3.10-2 and Figure 3.10-3. Overall, the shape of the projected future noise contours in Daly City are largely the same as existing conditions, although in some areas the contours have slightly expanded to include additional portions of the city. Figure 3.10-4 shows which land uses in the City's proposed General Plan land use map would be affected by noise increases resulting from implementation of the proposed General Plan.

TABLE 3.10-2: PROJECTED INCREASE IN NOISE LEVELS

<i>Roadway¹</i>	<i>Segment</i>	<i>Expected (2035) DNL dB*</i>	<i>Increase in dB from Existing (2008)</i>
Interstate 280	north of Hickey Blvd	86	1
Interstate 280	south of Hickey Blvd	87	1
Highway 1	Interstate 280 to Pacifica border	82	1
Highway 35	north of John Daly Blvd	76	2
Highway 35	south of John Daly Blvd	75	1
Highway 82/Mission Street	south of John Daly Blvd	75	2
Mission Street	north of John Daly Blvd	70	2
Geneva Avenue	San Francisco border to Bayshore Blvd	76	3
John Daly Boulevard	Highway 35 to Lake Merced Blvd	71	2
John Daly Boulevard	Lake Merced Blvd to Inter- state 280	76	1
John Daly Boulevard	Interstate 280 to De Long St	74	1
John Daly Boulevard	east of De Long St	72	-2
Junipero Serra Boulevard	San Francisco border to Colma border	73-76	2-7
Hickey Boulevard	Callan Blvd. to Colma border	70-74	1-5

¹ Only major roads are presented as well as roadways where noise increases were greater than 3 dB.

*Measured at a distance of 50 feet from the roadway centerline.

Source: Charles M. Salter Associates, Inc., 2012

Most major roadways in the city are expected to experience noise increases of 1-3 dB at 50 feet from the centerline as a result of the proposed General Plan, which is considered imperceptible to humans. However, segments of Junipero Serra Boulevard and Hickey Boulevard are expected to experience noise increases as high as 7 dB and 5dB, respectively, which would be readily perceptible to most humans. Additionally, sensitive receptors in a number of areas would fall within non-compatible future proposed noise contours as a result of the proposed General Plan. For example, the 70 dB noise contour would expand to include low density residential areas through the city, particularly along the Interstate 280 and Highway 1 corridors. While it is theoretically possible for these uses to employ noise-attenuating retrofits to reduce impacts, the City cannot guarantee that these measures will take place. Because noise levels will increase by more than 3 dB at certain locations in the city, the impact is significant and unavoidable.

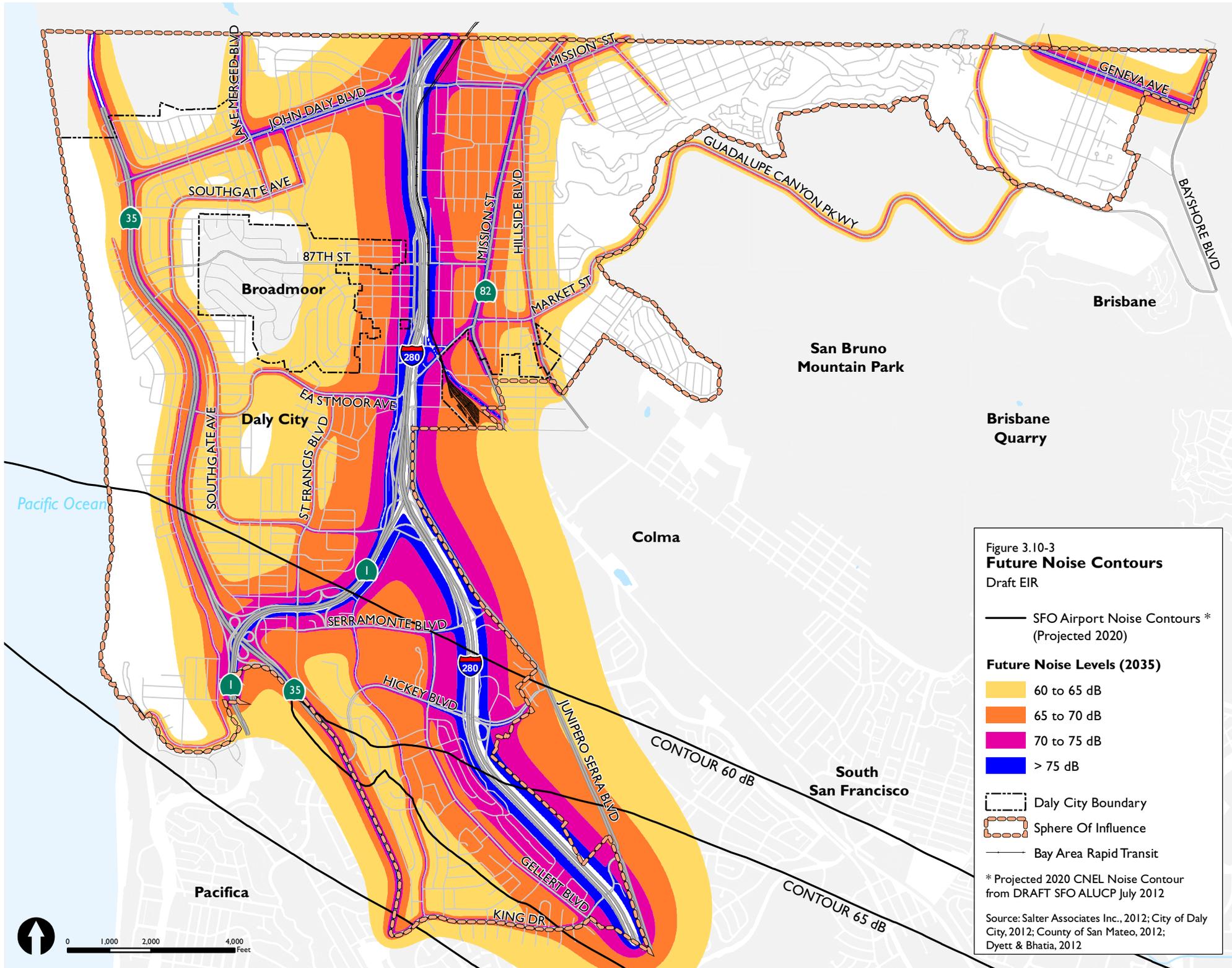


Figure 3.10-3
Future Noise Contours
 Draft EIR

- SFO Airport Noise Contours* (Projected 2020)

Future Noise Levels (2035)

- 60 to 65 dB
- 65 to 70 dB
- 70 to 75 dB
- > 75 dB

- - - Daly City Boundary
- ⊞ Sphere Of Influence
- Bay Area Rapid Transit

* Projected 2020 CNEL Noise Contour from DRAFT SFO ALUCP July 2012

Source: Salter Associates Inc., 2012; City of Daly City, 2012; County of San Mateo, 2012; Dyett & Bhatia, 2012