4.10 NOISE

This section describes the potential effects of the Project in relation to noise and vibration. Included in this chapter is background information on noise and vibration, a brief summary of the regulatory framework that pertains to the Project, an evaluation of the significance of Project impacts including noise and land use compatibility, long-term noise level increases resulting from Project-generated traffic, temporary noise and vibration impacts during construction, and cumulative impacts. This chapter incorporates the findings of the noise analysis conducted by PlaceWorks. Calculations for noise and vibration impacts are included as Appendix E of this Draft EIR.

4.10.1 ENVIRONMENTAL SETTING

4.10.1.1 BACKGROUND

Noise Descriptors

Noise is most often defined as unwanted sound. Although sound can be easily measured, the perception of noise and the physical response to sound complicate the analysis of its impact on people. People judge the relative magnitude of sound sensation in subjective terms such as "noisiness" or "loudness."

The following are brief definitions of terminology used in this section:

- **Sound.** A disturbance created by a vibrating object, which, when transmitted by pressure waves through a medium such as air, is capable of being detected by a receiving mechanism, such as the human ear or a microphone.
- **Noise.** Sound that is loud, unpleasant, unexpected, or otherwise undesirable.
- **Intrusive.** Noise which intrudes over and above the existing ambient noise at a given location. Relative intrusiveness depends on amplitude, duration, frequency, time of occurrence, and tonal or informational content, as well as the prevailing ambient noise level.
- **Decibel (dB).** A unit-less measure of sound on a logarithmic scale.
- **A-Weighted Decibel (dBA).** An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
- **Ambient Noise Level.** The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
- **Equivalent Continuous Noise Level (L_{eq}).** The mean of the noise level (or energy) averaged over the measurement period.
- **Statistical Sound Level (Ln).** The sound level that is exceeded "n" percent of time during a given sample period. For example, the L_{50} level is the statistical indicator of the time-varying noise signal that is exceeded 50 percent of the

time (during each sampling period); that is, half of the sampling time, the changing noise levels are above this value and half of the time they are below it. This is called the "median sound level." The L_{10} level, likewise, is the value that is exceeded 10 percent of the time (i.e. near the maximum) and this is often known as the "intrusive sound level." The L_{90} is the sound level exceeded 90 percent of the time and is often considered the "effective background level" or "residual noise level."

- **Day-Night Sound Level (L_{dn} or DNL).** The energy-average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the sound levels occurring during the period from 10:00 p.m. to 7:00 a.m.
- **Community Noise Equivalent Level (CNEL).** The energy-average of the A-weighted sound levels occurring during a 24-hour period, with 5 dB added to the levels occurring during the period from 7:00 p.m. to 10:00 p.m. and 10 dB added to the sound levels occurring during the period from 10:00 p.m. to 7:00 a.m.

Characteristics of Sounds

When an object vibrates, it radiates part of its energy as acoustical pressure in the form of a sound wave. Sound can be described in terms of amplitude (loudness), frequency (pitch), and duration (time). The human hearing system is not equally sensitive to sound at all frequencies. Therefore, to approximate the human, frequency-dependent response, the A-weighted filter system is used to adjust measured sound levels. The normal range of human hearing extends from approximately 0 dBA (the threshold of detection) to 140 dBA (the threshold of pain).

Unlike linear units such as inches or pounds, decibels are measured on a logarithmic scale to better account for the large variations in pressure amplitude (the above range of human hearing, 0 to 140 dBA, represents a ratio in pressures of one hundred trillion to one). All noise levels in this study are relative to the industry-standard pressure reference value of 20 micropascals. Because of the physical characteristics of noise transmission and perception, the relative loudness of sound does not closely match the actual amounts of sound energy. Table 4.10-1 presents the subjective effect of changes in sound pressure levels.

TABLE 4.10-1 CHANGE IN APPARENT LOUDNESS

± 3 dB	Threshold of human perceptibility
± 5 dB	Clearly noticeable change in noise level
± 10 dB	Half or twice as loud
± 20 dB	Much quieter or louder

Source: Bies and Hansen, 2009.

Sound is generated from a source; the decibel level decreases as the distance from that source increases. Sound dissipates exponentially with distance from the noise source. This phenomenon is known as spreading loss or distance attenuation.

When sound is measured for distinct time intervals, the statistical distribution of the overall sound level during that period can be obtained. For example, L_{50} is the noise level that is exceeded 50 percent of the time. Similarly, the L_{02}, L_{08}, and L_{25} values are exceeded 2, 8, and 25 percent of the time or 1, 5, and 15 minutes per hour. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. The energy-equivalent sound level (L_{eq}) is the most common parameter associated with community noise measurements. The L_{eq} metric is a single-number

noise descriptor of the energy-average sound level over a given period of time. An hour is the most common period of time over which average sound is measured, but it can be measured over any duration. Other values typically noted during a noise survey are the L_{min} and L_{max}. These values are the minimum and maximum root-mean-square (RMS) noise levels obtained over the stated measurement period.

Since sensitivity to noise increases during the evening and at night, when excessive noise can interfere with relaxation and/or the ability to sleep, 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. Because of this increased sensitivity to unwanted noise intrusion during the evening and nighttime hours, State law requires, for planning purposes, that this increased noise sensitivity be accounted for. The Day/Night Average Sound Level, L_{dn}, is a measure of the cumulative noise exposure in a community, with a 10 dB addition to nocturnal (10:00 p.m. to 7:00 a.m.) noise levels. The Community Noise Equivalent Level (CNEL) is a similar 24-hour cumulative measure of noise; however it differs slightly from L_{dn} in that 5 dB is added to the levels occurring during the period from 7:00 p.m. to 10:00 p.m. and 10 dB added to the sound levels occurring during the period from 10:00 p.m. to 7:00 a.m.

Psychological and Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects the entire system; prolonged noise exposure in excess of 75 dBA increases body tensions, thereby affecting blood pressure and functions of the heart and nervous system. Extended periods of noise exposure above 90 dBA results in permanent cell damage, which is the main driver for employee hearing protection regulations in the workplace. For community environments, the ambient or background noise problem is widespread and generally more concentrated in urban areas than in outlying, less-developed areas. Since most people do not routinely work with decibels or A-weighted sound levels, it is often difficult to appreciate what a given sound pressure level (SPL) number means. To help relate noise level values to common experience, Table 4.10-2 shows typical noise levels from noise sources.

Causes for annoyance include interference with speech, radio, television, and sleep and rest, as well as induced structural vibrations. The L_{dn} as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. The threshold for annoyance from vehicle noise is about 55 dBA L_{dn}. At an L_{dn} of about 60 dBA, approximately 8 percent of the population is highly annoyed. When the L_{dn} increases to 70 dBA, the highly annoyed proportion of the population increases to about 20 to 25 percent. There is, therefore, an increase of about 2 percent per decibel of increased noise between an L_{dn} of 60 to 70 dBA. The thresholds for speech interference indoors are approximately 45 dBA for continuous noise and approximately 55 dBA for fluctuating noise. Outdoors the thresholds are roughly 15 dBA higher. Steady noise above 35 dBA and fluctuating noise levels above roughly 45 dBA have been shown to affect sleep.

Vibration Fundamentals

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration is normally associated with activities stemming from operations of railroads or vibration-intensive stationary sources, but can also be associated with construction equipment such as jackhammers, pile drivers, and hydraulic hammers. Vibration displacement is the distance that a point on a surface moves

TABLE 4.10-2 TYPICAL NOISE LEVELS

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock Band
Jet Flyover at 1,000 feet		
	100	
Gas Lawn Mower at 3 feet		
	90	
Diesel Truck at 50 feet, at 50 miles per hour		Food Blender at 3 feet
	80	Garbage Disposal at 3 feet
Noisy Urban Area, Daytime		
	70	Vacuum Cleaner at 10 feet
Commercial Area		Normal speech at 3 feet
Heavy Traffic at 300 feet	60	
		Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (background)
Quiet Suburban Nighttime		
	30	Library
Quiet Rural Nighttime		Bedroom at Night, Concert Hall (background)
	20	
		Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: Bies and Hansen, 2009.

away from its original static position. The instantaneous speed that a point on a surface moves is the velocity, and the rate of change of the speed is the acceleration. Each of these descriptors can be used to correlate vibration to human response, building damage, and acceptable equipment vibration levels. During construction, the operation of construction equipment can cause groundborne vibration. During the operational phase of a project, receptors may be subject to levels of vibration

that can cause annoyance due to noise generated from vibration of a structure or items within a structure. These types of vibration are best measured and described in terms of velocity and acceleration.

The three main types of waves associated with groundborne vibrations are surface or Rayleigh waves, compression or P-waves, and shear or S-waves.

- Surface or Rayleigh waves travel along the ground surface. They carry most of their energy along an expanding cylindrical wave front, similar to the ripples produced by throwing a rock into a lake. The particle motion is more or less perpendicular to the direction of propagation.
- Compression or P-waves are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal, in a push-pull motion. P-waves are analogous to airborne sound waves.
- Shear or S-waves are also body waves, carrying their energy along an expanding spherical wave front. Unlike P-waves, however, the particle motion is transverse, or perpendicular to the direction of propagation.

Vibration amplitudes are usually described in terms of either the peak particle velocity (PPV) or the RMS velocity. PPV is the maximum instantaneous peak of the vibration signal and RMS is the square root of the average of the squared amplitude of the signal. PPV is more appropriate for evaluating potential building damage, whereas RMS is typically more suitable for evaluating human response.

The units for PPV and RMS velocity are normally inches per second (in/sec). Often, vibration is presented and discussed in dB units in order to compress the range of numbers required to describe the vibration. In this study, all PPV and RMS velocity levels are in in/sec and all vibration levels are in dB relative to one micro-inch per second (abbreviated as VdB). Typically, groundborne vibration generated by human activities attenuates rapidly with distance from the source of the vibration. Even the more persistent Rayleigh waves decrease relatively quickly as they move away from the source of the vibration. Man-made vibration problems are, therefore, usually confined to relatively short distances (500 to 600 feet or less) from the source.

Effects of Vibration

Table 4.10-3 displays human annoyance and the effects on buildings resulting from continuous vibration. As discussed previously, annoyance is a subjective measure and vibrations may be found to be annoying at much lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Persons exposed to elevated ambient vibration levels such as people in an urban environment may tolerate a higher vibration level.

Human response to ground vibration has been correlated best with the velocity of the ground. The velocity of the ground is expressed on the decibel scale. The reference velocity is 1×10^{-6} inch/second RMS, which equals 0 VdB, and 1 inch/second equals 120 VdB. The abbreviation "VdB" is used in this document for vibration decibels to reduce the potential for confusion with sound decibels. One of the problems with developing suitable criteria for groundborne vibration is the limited research into human response to vibration and, more importantly, human annoyance inside buildings. The U.S. Department of Transportation Federal Transit Administration (FTA) has developed rational vibration limits that can be used to evaluate

TABLE 4.10-3 REACTION OF PEOPLE AND DAMAGE TO BUILDINGS FOR CONTINUOUS/FREQUENT INTERMITTENT VIBRATION LEVELS

Land Use Category	Max L_v (VdB)[a]	Description
Workshop	90	Distinctly felt vibration. Appropriate to workshops and nonsensitive areas
Office	84	Felt vibration. Appropriate to offices and nonsensitive areas
Residential – Daytime	78	Barely felt vibration. Adequate for computer equipment
Residential – Nighttime	72	Vibration not felt, but groundborne noise may be audible inside quiet rooms

a. L_v is the velocity level in decibels, as measured in 1/3-octave bands of frequency over the frequency ranges of 8 to 80 Hz.
Source: FTA, 2006.

human annoyance to groundborne vibration. These criteria are primarily based on experience with rapid transit and commuter rail systems, and are discussed in greater detail in the regulations section of this document.

Railroad and transit operations are potential sources of substantial ground vibration depending on distance, the type and the speed of trains, and the type of track. Trains generate substantial vibration due to their engines, steel wheels, heavy loads, and wheel-rail interactions.

Construction operations generally include a wide range of activities that can generate groundborne vibration, which varies in intensity depending on several factors. In general, blasting and demolition of structures, as well as pile driving and vibratory compaction equipment generate the highest vibrations. Because of the impulsive nature of such activities, the use of the peak particle velocity descriptor (PPV) has been routinely used to measure and assess groundborne vibration and almost exclusively to assess the potential of vibration to induce structural damage and the degree of annoyance for humans. Vibratory compactors or rollers, pile drivers, and pavement breakers can generate perceptible amounts of vibration at up to 200 feet. Heavy trucks can also generate groundborne vibrations, which can vary, depending on vehicle type, weight, and pavement conditions. Potholes, pavement joints, discontinuities, differential settlement of pavement, etc., all increase the vibration levels from vehicles passing over a road surface. Construction vibration is normally of greater concern than vibration from normal traffic flows on streets and freeways with smooth pavement conditions.

"Architectural" damage can be classified as cosmetic only, such as minor cracking of building elements, while "structural" damage may threaten the integrity of a building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher and there is no general consensus as to what amount of vibration may pose a threat for structural damage to a building. Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is in a high state of disrepair and the construction activity occurs immediately adjacent to the structure. Table 4.10-4 shows the criteria established by the FTA for the likelihood of structural damage due to vibration.

TABLE 4.10-4 GROUNDBORNE VIBRATION CRITERIA: ARCHITECTURAL DAMAGE

Building Category		PPV (in/sec)	L_v (VdB)[a]
I.	Reinforced concrete, steel, or timber (no plaster)	0.5	102
II.	Engineered concrete and masonry (no plaster)	0.3	98
III.	Non-engineered timber and masonry buildings	0.2	94
IV.	Buildings extremely susceptible to vibration damage	0.12	90

a. RMS velocity calculated from vibration level (VdB) using the reference of one micro-inch/second.
Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment, 2006.

Noise- and Vibration-Sensitive Receptors

Certain land uses are particularly sensitive to noise and vibration, including residential, school, and open space/recreation areas where quiet environments are necessary for enjoyment, public health, and safety. Sensitive land uses within the City of Daly City include residences, schools, places of worship, and recreational areas. These uses are regarded as sensitive because they are where citizens most frequently engage in activities which are likely to be disturbed by noise, such as reading, studying, sleeping, resting, or otherwise engaging in quiet or passive recreation. Commercial and industrial uses are not considered noise- and vibration-sensitive uses for the purposes of this analysis since noise- and vibration-sensitive activities are less likely to be undertaken in these areas, and because these uses often themselves generate noise in excess of what they receive from other uses.

4.10.1.2 REGULATORY FRAMEWORK

To limit population exposure to physically and/or psychologically damaging as well as intrusive noise levels, the federal government, the State of California, various county governments, and most municipalities in the state, have established standards and ordinances to control noise. This section describes the regulatory framework related to noise and vibration in the vicinity of the Project site.

State Regulations

State of California Building Code

The State of California's noise insulation standards are codified in the California Code of Regulations, Title 24, Building Standards Administrative Code, Part 2, California Building Code. These noise standards are applied to new construction in California for the purpose of ensuring that the level of exterior noise transmitted to and received within the interior living spaces of buildings is compatible with their comfortable use. For new residential dwellings, hotels, motels, dormitories, and school classrooms, the acceptable interior noise limit for habitable rooms in new construction is 45 dBA CNEL or L_{dn}. Title 24 requires acoustical studies for residential development in areas exposed to more than 60 dBA CNEL to demonstrate that

the structure has been designed to limit interior noise in habitable rooms to acceptable noise levels. Where exterior noise levels are projected to exceed 60 dBA CNEL or L_{dn} at the façade of a building, a report must be submitted with the building plans describing the noise control measures that have been incorporated into the design of the Project to meet the 45 dBA noise limit.

State of California Land Use Compatibility Criteria

The State of California adopts suggested land use noise compatibility levels as part of its General Plan Update Guidelines. These suggested guidelines provide urban planners with an integral tool to gauge the compatibility of land uses relative to existing and future noise levels. The guidelines identify normally acceptable, conditionally acceptable, and clearly unacceptable noise levels for various land uses. A conditionally acceptable designation implies new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements for each land use is made and needed noise insulation features are incorporated into the design. By comparison, a normally acceptable designation indicates that standard construction can occur with no special noise reduction requirements. The Land Use Compatibility Guidelines are shown in Table 4.10-5.

Local Regulations

Daly City 2030 General Plan Noise Element

The Noise Element of the City of Daly City 2030 General Plan sets forth goals, policies, and actions, shown in Table 4.10-6, to assess and control environmental noise. The Noise Element also sets forth land use compatibility guidelines for noise-sensitive land uses and outdoor activity areas. The City has adopted the State's Land Use Compatibility Guidelines, shown in Table 4.10-5 above. These compatibility guidelines are intended to ensure that new development proposals do not introduce excessive noise in a given location to the detriment of existing uses, and conversely, to discourage introducing new uses to existing noise sources.

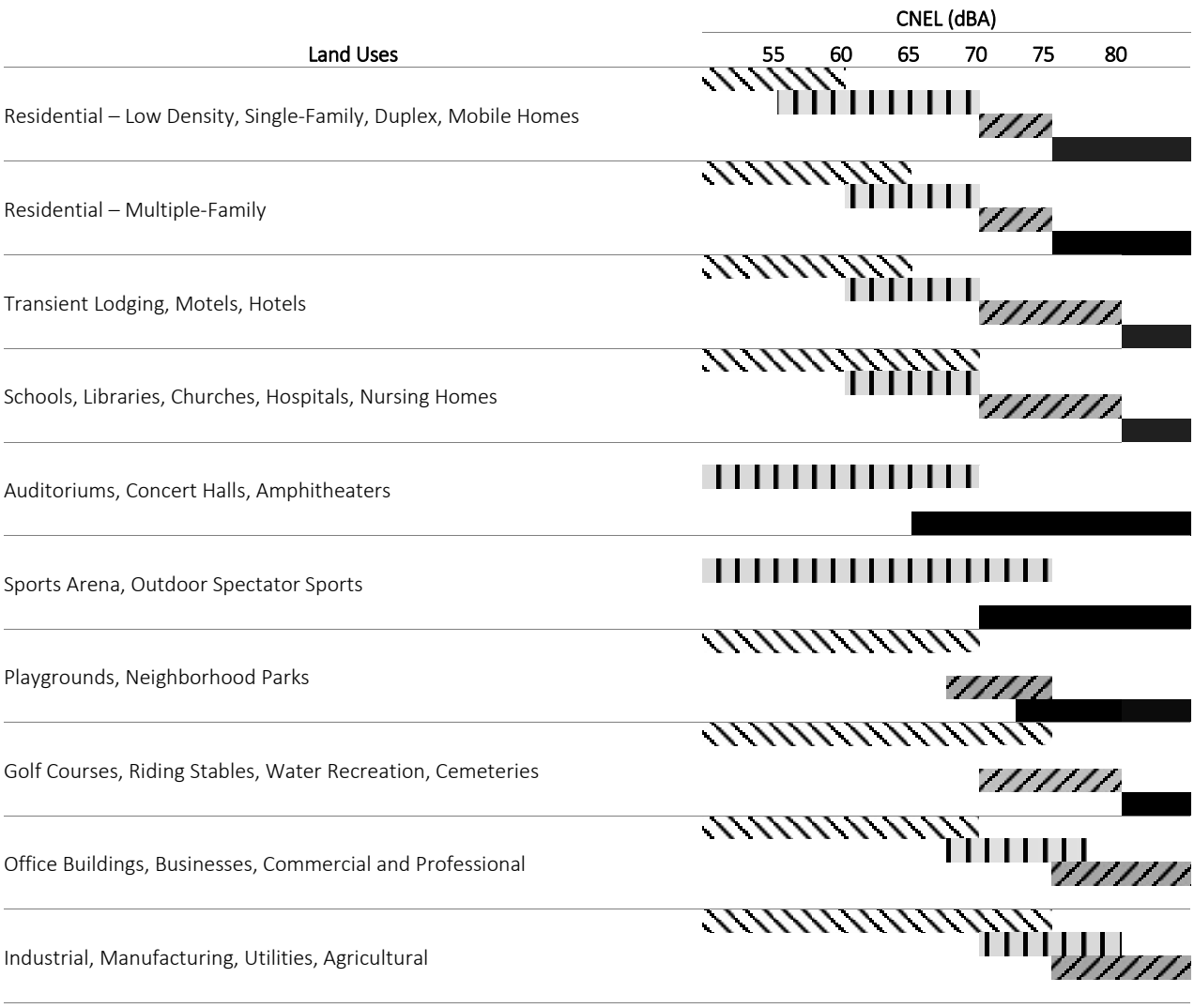
Daly City Municipal Code

The City of Daly City Municipal Code contains regulations to protect residents from noise disturbances. Section 9.22.010 prohibits an individual from causing a disturbance such that it disturbs the 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 PM and 6:00 AM no person shall cause, create, or permit any noise which may be heard beyond the confines of the property of origin. The municipal code does not define maximum sound level limits in quantitative terms.

Another noise regulation, Section 15.00.130, states that any home constructed after 1993 and located within the 65 CNEL (FAA approved) contour of the Aircraft Noise Soundproofing Project Area Map must be insulated to meet standards applied in noise insulation programs supported by the Federal Aviation Administration.

The Daly City Municipal Code does not contain regulations for the maximum sound level or hours of construction activities, nor does it contain vibration standards.

TABLE 4.10-5 LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENTS



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 the needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

Normally Unacceptable:
New construction or development should generally be discouraged. If new construction does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Clearly Unacceptable:
New construction or development generally should not be undertaken.

Source: Office of Noise Control, Guidelines for the Preparation and Content of Noise Elements of the General Plan, February 1976. Included in the Governor's Office of Planning and Research, California, *General Plan Guidelines*, Appendix C, October 2003.

TABLE 4.10-6 GOALS, POLICIES, AND ACTIONS OF THE DALY CITY 2030 GENERAL PLAN NOISE ELEMENT

Goal/Policy Number	Goal/Policy
Goal 1	Promote a noise environment that reflects a balance of the various City objectives while providing an environment that maintains a healthy living environment; fosters relaxation and recreation; is conducive to the work environment; and provides pleasant living conditions.
Policy NE-1	Use the future noise contour map to identify existing and potential noise impact areas.
Task NE-1.1	Use the existing and projected noise contours in conjunction with the State Office of Noise Control Guidelines (Guidelines) to identify areas where land use incompatibilities exist and to guide future noise sensitive development to appropriate and compatible locations.
Task NE-1.2	Use the existing and projected noise contours to identify existing noise impact areas that could benefit from noise insulation programs.
Policy NE-2	Use the State Office of Noise Control Guidelines as a guide to assess development that will need additional noise study and mitigations.
Task NE-2.1	Use the Noise Control Guidelines to assess the suitability of a site for new development in combination with the noise contours to accurately identify areas that may need additional noise study and mitigation. Noise mitigations include additional insulation, double glazing of windows and increasing building setbacks from the noise source. Mitigations should also be creative and attractive whenever possible and appropriate. Creative noise mitigation measures can include incorporation of fountains using water to mask freeway noise and noise walls of an appropriate scale painted with decorative murals.
Policy NE-3	Maintain a CNEL level of not more than 70 dBA L_{eq} in residential areas.
Task NE-3.1	Continue to enforce the environmental noise requirements of the State Building Code (Title 24).
Task NE-3.2	Encourage noise insulation programs in areas that do not meet the current noise standard and ensure that future development is mitigated appropriately or avoided in areas where the noise levels exceed or is projected to exceed 70 dBA L_{eq}.
Policy NE-4	Maintain a noise level not in excess of 75 dBA CNEL in open space, parks, and tot lots, including outdoor activity areas such as outdoor entertainment or green space of multi-family projects.
Task NE-4.1	When feasible, situate new parks and tot-lots away from busy streets or other known noise sources.
Policy NE-5	Maintain the City's current standard of 75 dBA CNEL for office, commercial, and professional areas.
Task NE-5.1	Additional noise studies should be conducted in "Conditionally Acceptable" noise environments to ensure adequate mitigation features are employed. Usually conventional construction with closed windows and fresh air supply systems will maintain a healthy noise environment.
Policy NE-6	Require new development to perform additional acoustical studies in noise environments that are identified as 'Conditionally Acceptable' or 'Normally Unacceptable' to the Guidelines.
Task NE-6.1	Require acoustical studies for new development through the discretionary review and California Environmental Quality Act processes, while paying particular attention to borderline noise environments. Conditions and mitigations, as appropriate, should be attached to projects.
Task NE-6.2	As part of the development of the new Commercial Mixed-Use zone, identify and codify, where possible, noise attenuation measures to assure that noise impacts by more intensive development to adjacent residential uses are reduced.
Policy NE-7	Require proposed intensification of development and proposed new development in noise environments identified as "Clearly Unacceptable" in the Guidelines to reduce ambient interior noise levels to 45 dBA CNEL.
Task NE-7.1	Either discourage new development or mitigate the noise impacts to it in areas identified as "Clearly Unacceptable" in the Noise Compatibility Guidelines.
Policy NE-8	Discourage noise sensitive land uses from locating in areas of inappropriate or high noise levels.

TABLE 4.10-6 GOALS, POLICIES, AND ACTIONS OF THE DALY CITY 2030 GENERAL PLAN NOISE ELEMENT

Goal/Policy Number	Goal/Policy
Task NE-8.1	Work to ensure that the outdoor ambient noise levels for uses such as day care centers, extended care facilities, and group care homes in residential neighborhoods not exceed 70 dBA CNEL. For such uses allowed by right, the City should encourage a potential care provider to maintain an appropriate noise environment.
Task NE-8.2	Continue to attach conditions of project approval to residential day care centers in excess of eight children through the administrative use permit process to maintain an appropriate noise environment.
Policy NE-9	Work to ensure that the expansion of or changes to existing land uses do not create additional noise impacts for sensitive receptors in the vicinity of the project from intensification or alteration of existing land uses by requiring applicants.
Task NE-9.1	Depending upon the hours of operation, intensity of use, and the location of sensitive receptors in the area, the expansion or change of use could cause noise impacts. Acoustical studies should be performed, at the applicant's expense, during the discretionary and environmental review processes and conditions should be placed on the project accordingly.
Policy NE-10	Work with SamTrans and MUNI in the placement of bus stops in order to reduce noise associated with bus activity to noise sensitive receptors.
Policy NE-11	Require that all future land use actions and/or associated development conforms to the relevant height, aircraft noise, and safety policies and compatibility criteria contained in the most recently adopted version of the Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport.
Task NE-11.1	Route any proposed land use policy actions, including new specific plans, zoning ordinances, general plan amendments, and rezoning involving land development to the Airport Land Use Commission in compliance with the Airport Land Use Plan.
Task NE-11.2	Require that development involving the construction of one or more dwelling units within the 65 dBA CNEL SFO noise contour to submit an avigation easement to the airport, when required by the Airport Land Use Commission. Specific avigation easement requirements shall be consistent with the Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport. This requirement shall be implemented prior to final project approval or, if the project requires construction, prior to building permit issuance.
Task NE-11.3	Require all future development within the Airport Influence Area B boundary for San Francisco International Airport to conform to the relevant height/airspace protection, aircraft noise, and safety policies and land use compatibility criteria contained within the most recent adopted version of the comprehensive airport/land use compatibility plan (ALUCP) for the environs of San Francisco International Airport.
Task NE-11.4	Ensure that all future development in Daly City complies with all relevant FAA standards and criteria for safety, regarding flashing lights, reflective building material, land uses that may attract large concentrations of birds, HVAC exhaust vents, thermal plumes, and uses that may generate electrical/electronic interference with aircraft communications and/or instrumentation.

Source: Daly City 2030 General Plan Noise Element.

4.10.1.3 EXISTING CONDITIONS

The Project site consists of an existing shopping center and associated parking lots. The Project site is bounded by I-280, Highway 1, Callan Boulevard, and Serramonte Boulevard, and is located approximately 5 miles northwest of San Francisco International Airport. Land uses surrounding the project area include a mix of single- and multi-family residential, office, commercial, and cemeteries. Tables 4.10-7 to 4.10-9 below show existing traffic noise levels on local roads during weekdays, weekends, and on Freeways during the weekdays.

TABLE 4.10-7 EXISTING WEEKDAY TRAFFIC NOISE LEVELS

Roadway	Segment	Daily Traffic Volumes	Noise Level at 50 Ft. (Dba CNEL)	Distance to Noise Contour (Feet)		
				70 Dba CNEL	65 Dba CNEL	60 Dba CNEL
Clarinada Avenue	St Francis Boulevard to ramps	6,650	64.0	20	43	93
Clarinada Avenue	Ramps to Callan Boulevard	5,580	63.7	19	41	88
Callan Boulevard	Southgate Avenue to Clarinada Avenue	8,040	64.10	23	49	106
Callan Boulevard	Clarinada Avenue to Serramonte Boulevard	9,300	65.5	25	54	116
Serramonte Boulevard	St Francis Boulevard to ramps	6,380	62.7	16	35	76
Serramonte Boulevard	Ramps to Callan Boulevard	6,940	63.1	17	37	80
Serramonte Boulevard	Callan Boulevard to entrance (Target)	9,400	64.4	21	45	98
Serramonte Boulevard	Entrance (Target) to Gellert Boulevard	11,300	65.2	24	51	111
Serramonte Boulevard	Gellert Boulevard to off-ramp	23,730	68.4	39	84	182
Serramonte Boulevard	Off-ramp to on-ramp	22,620	68.2	38	82	176
Serramonte Boulevard	On-ramp to Junipero Serra Boulevard	17,270	67.0	32	68	147
Gellert Boulevard	Serramonte Boulevard to Hickey Boulevard	17,660	70.2	52	112	241
Callan Boulevard	Serramonte Boulevard to Hickey Boulevard	9,020	63.5	19	40	86
Junipero Serra Boulevard	Southgate Avenue to Serramonte Boulevard	17,350	70.0	50	108	233
Junipero Serra Boulevard	Serramonte Boulevard to Hickey Boulevard	18,540	70.3	52	113	243
Hickey Boulevard	Skyline Boulevard to Callan Boulevard	13,230	67.4	34	73	156
Hickey Boulevard	Callan Boulevard to Gellert Boulevard	11,520	66.8	31	66	143
Hickey Boulevard	Gellert Boulevard to ramps	24,140	70.0	50	108	234
Hickey Boulevard	Ramps to Imperial Way	23,480	69.9	49	106	229
Hickey Boulevard	Imperial Way to Junipero Serra Boulevard	19,090	69.0	43	93	200
Callan Boulevard	Hickey Boulevard to Wembley Drive	6,830	62.3	15	33	72
Gellert Boulevard	Hickey Boulevard to Wembley Drive	11,860	64.7	22	48	103

Notes: Noise level contour calculations included in Appendix E.
Source: PlaceWorks, 2015.

TABLE 4.10-8 EXISTING SATURDAY TRAFFIC NOISE LEVELS

Roadway	Segment	Daily Traffic Volumes	Noise Level at 50 Ft. (Dba CNEL)	Distance to Noise Contour (Feet)		
				70 Dba CNEL	65 Dba CNEL	60 Dba CNEL
Clarinada Avenue	St Francis Boulevard to ramps	4,230	62.1	15	32	69
Clarinada Avenue	Ramps to Callan Boulevard	4,610	62.9	17	36	77
Callan Boulevard	Southgate Avenue to Clarinada Avenue	6,270	63.8	19	41	89
Callan Boulevard	Clarinada Avenue to Serramonte Boulevard	7,630	64.6	22	47	102
Serramonte Boulevard	St Francis Boulevard to ramps	6,040	62.5	16	34	73
Serramonte Boulevard	Ramps to Callan Boulevard	7,970	63.7	19	41	88
Serramonte Boulevard	Callan Boulevard to entrance (Target)	9,600	64.5	21	46	99
Serramonte Boulevard	Entrance (Target) to Gellert Boulevard	14,320	66.2	28	60	130
Serramonte Boulevard	Gellert Boulevard to off-ramp	30,180	69.4	46	99	213
Serramonte Boulevard	Off-ramp to on-ramp	29,580	69.4	45	98	210
Serramonte Boulevard	On-ramp to Junipero Serra Boulevard	22,530	68.2	38	81	175
Gellert Boulevard	Serramonte Boulevard to Hickey Boulevard	25,100	71.8	66	141	305
Callan Boulevard	Serramonte Boulevard to Hickey Boulevard	8,220	63.1	17	38	81
Junipero Serra Boulevard	Southgate Avenue to Serramonte Boulevard	21,770	71.0	58	126	271
Junipero Serra Boulevard	Serramonte Boulevard to Hickey Boulevard	19,240	70.5	54	116	249
Hickey Boulevard	Skyline Boulevard to Callan Boulevard	12,100	67.0	32	68	147
Hickey Boulevard	Callan Boulevard to Gellert Boulevard	11,340	66.8	30	66	141
Hickey Boulevard	Gellert Boulevard to ramps	24,720	70.1	51	110	237
Hickey Boulevard	Ramps to Imperial Way	24,330	70.1	51	109	235
Hickey Boulevard	Imperial Way to Junipero Serra Boulevard	19,860	69.2	44	95	205
Callan Boulevard	Hickey Boulevard to Wembley Drive	5,980	61.8	14	30	65
Gellert Boulevard	Hickey Boulevard to Wembley Drive	12,580	65.0	23	50	107

Notes: Noise level contour calculations included in Appendix E.
Source: PlaceWorks, 2015.

TABLE 4.10-9 EXISTING FREEWAY TRAFFIC NOISE LEVELS

Roadway	Segment	Daily Traffic Volumes	Noise Level At 100 Ft. (Dba CNEL)	Distance to Noise Contour (Feet)		
				75 dba CNEL	70 Dba CNEL	65 Dba CNEL
I-280	Vicinity of Hickey Boulevard	180,000	82.7	324	699	1506
Highway 1	vicinity of Clarinada Avenue	65,000	76.9	133	287	618

Notes: Noise level contour calculations included in Appendix E.
Source: PlaceWorks, 2015.

Project and Nearby Sensitive Receptors

Certain land uses are particularly sensitive to noise and vibration. These uses include residences, schools, hospital facilities, houses of worship, and open space/recreation areas where quiet environments are necessary for the enjoyment, public health, and safety of the community. Commercial and industrial uses are not considered noise- and vibration-sensitive uses.

The Project would include restaurant and retail uses, an 10-screen cinema complex, a medical building, a hotel, a parking garage, and continued use of existing parking lots; none of the new or continued uses under the project are regarded as noise-sensitive. Surrounding land uses consist of single- and multi-family residential to the west and south; commercial retail to the east, west, and south; offices to the north; and cemeteries to the south of the project area.

Nearby Noise Sources

On-Road Vehicles

On-road vehicles represent the most prominent source of noise in the project area, and the majority of traffic and resultant noise are associated with Interstate 280. Other roadways which generated relatively high amounts of noise included Highway 1, Gellert Boulevard, Junipero Serra Boulevard, and Serramonte Boulevard, which serves as a primary entrance to the shopping center.

Airports

San Francisco International Airport is located approximately 5 miles to the southeast of the Project site and is a source of noise, primarily from airplane takeoffs and landings. During relatively quiet periods and depending on weather conditions, the sound of jet engines may be readily discernible. In general, noise from aircraft makes a relatively minor contribution to the overall noise environment.

Stationary-Source Noise

Stationary-source noise from commercial operations within and surrounding the Project site result primarily from mechanical sources and systems, including heaters, ventilation systems, pumps, compressors, air conditioning (HVAC), and refrigeration.

4.10.2 STANDARDS OF SIGNIFICANCE

An Initial Study was prepared for the Project (see Appendix A of this Draft EIR). Based on the analysis contained in the Initial Study it was determined that development of the Project would not result in significant environmental impacts per the following significance criteria and therefore, these are not discussed in this chapter.

- Expose people residing or working in the vicinity of the Project to excessive aircraft noise levels, for a project located within an airport land use plan, or where such a plan has not been adopted, within 2 miles of a public airport or public use airport.
- Expose people residing or working in the vicinity of the Project to excessive noise levels, for a project within the vicinity of a private airstrip.

Based on the Initial Study it was determined that the Project could result in a significant noise impact if it would:

1. Expose people to or generate noise levels in excess of standards established in the General Plan or the Municipal Code, and/or the applicable standards of other agencies.
2. Expose people to or generate excessive groundborne vibration or groundborne noise levels.
3. Result in a substantial permanent increase in ambient noise levels in the vicinity of the Project above levels existing without the Project.
4. Result in a substantial temporary or periodic increase in ambient noise levels in the vicinity of the Project above levels existing without the Project.

4.10.3 IMPACT DISCUSSION

This section analyzes potential project-specific and cumulative impacts in regard to noise. This discussion is organized by and responds to each of the potential impacts identified in the Standards of Significance.

NOISE-1	**The Project could expose people to or generate noise levels in excess of standards established in the General Plan or the Municipal Code, and/or the applicable standards of other agencies.**

Noise is regulated by numerous codes and ordinances across federal, State, and local agencies. In addition, the City of Daly City regulates noise disturbances through the Municipal Code. The Project proposes to redevelop and expand the

Serramonte Shopping Center. Buildout is anticipated to take up to ten years. Under the Project, land use on the Site would remain commercial; however, the mix of commercial uses would change to include a cinema, a hotel, and a medical office building. Additional attendant modifications to the Project site would include upgrading the main entry road off Serramonte Boulevard at Gellert Boulevard and the property's loop road with improved landscaping and lighting. The following discusses potential noise impacts associated with operation of the project to nearby uses, and land use compatibility with the future ambient noise.

Non-Transportation Sources Operational Noise

Ongoing operations of the retail and restaurant uses, as well as the new cinema use, would include noise-generating activities and equipment that are similar to those that currently exist on the site; these would potentially include landscaping, maintenance, truck loading/unloading, HVAC systems, and patrons' use of the shopping center and associated parking lots. The following discusses activities from the project that may potentially result in noise impacts and how they may conflict with standards in the City's General Plan and Municipal Code.

Landscaping, maintenance, and vehicle loading/unloading are all intermittent activities that typically occur with commercial land uses. The frequency, intensity, and duration of these activities varies depending on the nature of the commercial use, and the Project is anticipated to result in all these activities from time to time.

Landscaping and Building Maintenance

The Project would keep the same land use and would add buildings to the existing footprint. It would not add a substantial amount of landscaped area compared to the current Site. It is thus anticipated that landscaping and building maintenance activity would not substantially increase compared to existing activity. The Project would therefore not cause a perceptible noise increase related to landscaping and building maintenance activities.

HVAC Systems

HVAC unit noise is mostly related to the operation of the rooftop and ground-level units, which include fans and condensers. HVAC units currently operate on the Project site due to existing retail and commercial uses. New buildings would increase the number of HVAC units operating on the site, and would place them closer to the boundary of the Project site. However, noise-sensitive residential uses within the vicinity of the Project are located at least 175 feet from the edge of the proposed structures, and are located between Highway 1 and Callan Boulevard. Due to distance attenuation and traffic noise, noise from HVAC units would be less than the ambient noise levels. Therefore, noise from the operation of the HVAC units would result in a less than significant noise impact for the nearest noise sensitive uses.

Truck Deliveries

Deliveries currently occur at existing commercial uses on the Project site. Under the Project, new commercial uses and tenants would use existing and new loading docks. No further details on loading dock placement are available at the time of the writing of this EIR. While a slight increase in truck delivery would occur, no noise impacts are anticipated, as the retail buildings on the Project site would continue to be located over 500 feet from the nearest residential areas. Retail uses are not expected to require long durations of loading and unloading activity. The medical offices would not include loading docks. Due to distance attenuation and existing traffic noise on I-280 and Highway 1 in the vicinity of the residences that

would overshadow noise from the truck loading docks, little if any noise from delivery activity would reach nearby sensitive receptors. Potential noise impacts from truck deliveries would be less than significant.

Patron and Parking Lot Activity

Shopping centers and commercial uses in general often experience noise resulting directly from their patrons' arrivals, departures, and other activities. In parking lots, such noise is often the result of car horns, vehicle door slams, and running engines; human speech is also frequently a notable source of noise throughout shopping centers and their parking areas. Parking lot activity is an existing source of noise on the Project site, however, the Project proposes to reconfigure certain parking areas and add a parking garage on the west side of the Project site. The addition of a cinema will likely result in increased nighttime and weekend activity. As the cinema would be located on the western side of the Project site, attendees would likely park on the western side of the site and in the parking structure. Although there may be increased parking lot activity, there would remain a distance of more than 400 feet between parking lots and the nearest residential receptors. Due to distance attenuation, traffic noise on roads ambient noise levels, it would be extremely unlikely for an increase in noise levels to be experienced at residential properties due to parking lot activity. Therefore, impacts in this regard would be *less than significant*.

Implementation of the Project would not result in any new types of stationary noise, and would not result in a substantial increase over existing noise levels at the Project site. Additionally, distance attenuation and high ambient noise levels at nearby sensitive receptors due to traffic noise from Highway 1 and I-280 make it highly unlikely that an increase in noise levels would be experienced at nearby residences. The Project would not violate Policy NE-9 of the Noise Element or Chapter 9.22 of the Municipal Code. Therefore, impacts would be *less than significant*.

Ambient Noise and Land Use Compatibility

The land use noise compatibility guidelines in the City's General Plan Noise Element lists the development of new retail and commercial uses as "Normally Acceptable" for ambient noise levels of up to 70 dBA CNEL, and "Conditionally Acceptable" for ambient noise levels up to 77 dBA CNEL. For the development of new hotel uses, noise levels ranging from 60 to 70 dBA CNEL is considered "Conditionally Acceptable", and ambient noise levels ranging from 70 to 80 dBA CNEL is considered "Normally Unacceptable" .

Policy NE-5 directs the City to maintain a standard of 75 dBA CNEL for office, commercial, and professional areas. Task NE-5.1 States that "additional noise studies should be conducted in "Conditionally Acceptable" noise environments to ensure adequate mitigation features are employed. Usually conventional construction with closed windows and fresh air supply systems will maintain a healthy noise environment."The proposed hotel on the northern end and retail buildings in the Southeast Quadrant would be located 220 feet and 250 feet, respectively, from the centerline of I-280, and would be within the 75 CNEL contour. Therefore, the Project would be required to perform an evaluation for noise compatibility, in order to comply with Title 24 requirements. Title 24 requires acoustical studies for residential development, including hotels, in areas exposed to more than 60 dBA CNEL to demonstrate that the structure has been designed to limit interior noise in habitable rooms to acceptable noise levels of 45 dBA CNEL or L_{dn}. Where exterior noise levels are projected to exceed 60 dBA CNEL or L_{dn} at the façade of a building, a report must be submitted with the building plans describing the noise control measures that have been incorporated into the design of the Project to meet the 45 dBA noise limit. Normal construction methods will provide enough noise reduction that the resulting interior noise levels would be acceptable for

retail uses. The other new buildings, which would all be categorized as retail, commercial, and office uses, would be constructed outside of the 75 dBA CNEL contours. No noise study would be required for the buildings in the Southeast Quadrant, since they are retail uses.

However, the proposed hotel uses would be located within the 75 dBA CNEL noise contour level due to traffic noise on nearby roads and freeways. The proposed hotel uses would be in an area exposed to noise levels considered "conditionally unacceptable" according to the Noise Element land use compatibility. Typical building construction normally provides an exterior-to-interior noise reduction of approximately 20 dBA. Therefore, normal building construction may not provide sufficient noise reduction to hotel rooms to comply with the required interior noise level of 45 dBA CNEL. Without mitigation, this would be a *significant* impact.

IMPACT NOISE-1: Development of the hotel uses in proximity of Freeways may result in interior noise levels at hotel rooms in excess of 45 dBA CNEL, as required by Title 24.

> **Mitigation Measure NOISE-1:** Perform a detailed analysis of the noise reduction requirements and the needed noise insulation features for the hotel. The analysis must show that the hotel will meet the 45 CNEL interior noise requirement of Title 24 of the California Building Code, and the applicant must implement the required construction features to the satisfaction of the Planning Department Director prior to obtaining building permits for the hotel. Interior noise reduction may be achieved with upgraded construction materials for windows, wall assemblies, and exterior doors.
>
> **Significance After Mitigation:** Less than significant.

NOISE-2	**The Project would not expose people to or generate excessive groundborne vibration or groundborne noise levels.**

CEQA does not specify quantitative thresholds for what is considered "excessive" vibration or ground-borne noise. Neither the City of Daly City nor San Mateo County establishes such thresholds. Therefore, based on criteria from the FTA, a significant impact would occur if:

- Implementation of the Project would result in vibration exceeding the criteria presented in Table 4.10-3 that could cause buildings architectural damage.
- Implementation of the Project would exceed the criteria for annoyance presented in Table 4.10-4.

The following discusses short-term construction and long-term operations impacts from implementation of the Project:

Short-Term Construction Vibration Impacts

Project demolition and construction would take place would take place periodically over the ten-year buildout timeline. The timeline is intended to provide flexibility and allow the Shopping Center to be responsive to market needs and development trends. As stated in Chapter 3, Project Description, the existing buildings on the northern portion of the Project site would include 12,500 square feet of demolition and proposes new retail up to 84,500 square feet and a new

five-story, 75,000-square-foot hotel. Existing buildings in the Southeast Quadrant would include demolition of 15,545 square feet and proposes up to 89,600 square feet of retail uses. 65,000 square feet of medical offices and 78,000 square feet of retail would be constructed in the southwest corner of the Project site. Additionally, a 47,000-square-foot cinema is proposed above the existing 20,000-square-foot fitness center, which would include 2,955 of demolition to accommodate the cinema. Further, a 40,000-square-foot Dave and Buster's and 30,500 square feet of ancillary retail and restaurant use would be constructed between Dick's Sporting Goods and Target, which would include 22,000 square feet of demolition. Also, 12,000 square feet of restaurant space would occur adjacent to the east entrance of Macy's, as well as a four-story, 348,000-square-foot parking garage adjoining the existing mall. For the purposes of construction analysis, it has been assumed that activity will take place in two main phases, for a period of 12 months in 2016/2017 and 12 months in 2020/2021, with all construction finished by 2022. Any construction-related vibration would be therefore limited to this timeframe and would also be limited geographically to the areas closest to vibration-intensive construction activities. Construction activities are planned to include demolition, site preparation work, grading, building construction, and paving.

The effect on buildings in the vicinity of a construction site varies depending on soil type, ground strata, and receptor-building construction. The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibrations at moderate levels, to slight structural damage at the highest levels. Vibration from construction activities rarely reaches the levels that can damage structures, but groundborne vibration and groundborne noise can reach perceptible and audible levels in buildings that are very close to the construction site.

As shown in Table 4.10-10, which lists vibration levels for construction equipment, pile driving is the construction technique with the greatest potential to generate high ground vibration levels and is of primary concern in regard to structural damage; particularly when it occurs within 100 feet of structures. Vibration levels generated by pile driving activities vary depending on site-specific conditions, such as soil characteristics, construction methods, and equipment used. Other construction activities, such as caisson drilling, the use of jackhammers, rock drills and other high-power or vibratory tools, and the use of rolling stock equipment (tracked vehicles, compactors, etc.) may also potentially generate substantial vibration in the immediate vicinity.

Given that demolition and construction for the Project would not include pile driving, the potential for annoying or damaging vibration from Project construction activities is related to the use of heavy earthmoving equipment, vibratory rollers, and jackhammers. Grading and demolition activities typically generate the highest vibration levels during construction activities. Except for pile driving, maximum vibration levels measured at a distance of 25 feet from an individual piece of typical construction equipment rarely exceed the thresholds for human annoyance for office and other non-sensitive uses (i.e. 84 VdB) or the thresholds for architectural damage at any type of receptor land use (i.e. 0.2 to 0.5 RMS velocity in inches per second).

The nearest off-site buildings are offices across Southgate Avenue, 130 feet north of the nearest location for a building to be demolished and built. At this distance, vibration levels would not exceed 0.018 RMS velocity in inches per second, which is well below the threshold for structural damage. In terms of annoyance, levels could potentially reach 80 VdB, which would be below the threshold of 84 VdB for annoyance at office uses. The nearest residential properties are located at a distance of at least 175 feet from the nearest structure to be demolished or constructed, and it is thus regarded as extremely unlikely that construction would result in levels of vibration that would be perceptible, let alone damaging, at nearby off-site sensitive receptors. Existing buildings on the Project site may be exposed to vibration levels that exceed the annoyance

TABLE 4.10-10 GROUNDBORNE VIBRATION LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	Approximate Velocity Level at 25 Feet (VdB)	Approximate RMS[a] Velocity at 25 Feet (inch/sec)
Pile Driver (Impact) Upper Range	112	1.518
Pile Driver (Impact) Lower Range	104	0.644
Pile Driver (Sonic) Upper Range	105	0.734
Pile Driver (Sonic) Lower Range	93	0.170
Large Bulldozer	87	0.089
Caisson Drilling	87	0.089
Jackhammer	79	0.035
Small Bulldozer	58	0.003
Loaded Trucks	86	0.076
FTA Criteria – Human Annoyance (Daytime)	78 to 90[b]	—
FTA Criteria – Structural Damage	—	0.2 to 0.5[c]

a. RMS velocity calculated from vibration level (VdB) using the reference of 1 micro-inch/second.
b. Depending on affected land use. For residential 78 VdB, for offices 84 VdB, workshops 90 VdB.
c. Depending on affected building structure, for timber and masonry buildings 0.2 in/sec, for reinforced concrete, steel, or timber 0.5 in/sec.
Source: Federal Transit Administration, Transit Noise, and Vibration Impact Assessment, 2006.

threshold when demolition or construction activities are taking place nearby. However, all of the current uses on the Project site are retail and commercial, which are not vibration-sensitive uses. Vibration levels may reach levels of annoyance at portions of the Shopping Center immediately adjacent from where demolition and grading activities occur. In general, construction would be localized, would occur intermittently and variably, and would only occur for relatively short periods of time, these occurrences would not interfere with business activities at the Shopping Center.

Given that construction and demolition activities related to the Project would not make use of the most vibration-intensive construction equipment, given that most off-site sensitive receptors and structures are located at sufficient distance from construction areas so as to prevent vibration impacts, and given that on-site uses are not vibration-sensitive, construction-related vibration would therefore result in a *less-than-significant* impact with respect to both annoyance and architectural damage.

Vibration Related to Operations

The Project includes a hotel and commercial land uses, including retail, restaurants, and a movie theater. None of these uses are typically associated with the potential generation of perceptible and/or potentially damaging levels of vibration.

Applicable Regulations:

- City of Daly City 2030 General Plan Noise Element
- City of Daly City Municipal Code Chapter 9.22, Disturbing the Peace

Significance Before Mitigation: Less than significant.

NOISE-3	**The Project would not result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the Project.**

CEQA does not define what noise level increase would be considered substantial; however, the common practice in impact assessments generally considers any 5 dBA or greater increase due to the project to be substantial, and considers a 3 dBA or greater increase due to the project to be substantial, if the resulting noise level would be in excess of an applicable ambient noise level standard. Although neither the Daly City 2030 General Plan Noise Element nor the Daly City Municipal Code explicitly establish thresholds for substantial permanent noise increases, the Noise Element includes references which support the use of these criteria. Specifically, the Daly City Noise Element identifies 3 dBA and 5 dBA as the increases that are, respectively, "barely perceptible" and "clearly noticeable" by the human ear. In the absence of explicit thresholds and given the implicit support of the Noise Element, the 5 and 3 dBA project-related thresholds are used in this EIR for evaluating substantial permanent increases to ambient noise levels.

Stationary Noise

As discussed under Impact NOISE-1 above, stationary noise sources associated with the Project would not result in significant increases above existing ambient noise levels.

Transportation-Related Noise

On-Road Vehicle Noise

The renovated structures, commercial uses, and tenants under the Project are anticipated to attract additional patronage to the Serramonte Shopping Center, with most of the visitors arriving by private automobile. As such, the Project is anticipated to generate additional traffic in the Project vicinity, and this increased traffic could result in higher ambient noise levels. Noise would be generated by vehicles as they arrive and depart from the parking areas associated with the Project, with sensitive receptors near parking entrances experiencing the greatest potential impact.

Since this Project includes a cinema, and the continued presence of both restaurants and large retailers with a regional draw, it is important to consider the unique characteristics and interactions of these uses. Unlike retail uses, which experience peak use during the midday and afternoon hours on weekends, or restaurant uses, which would have the highest use in the early to mid-evening hours, cinemas tend to experience their highest use in the mid to late evening hours, most notably on Friday and Saturday nights. It is therefore important to consider not only the overall increases to traffic noise that would result from all the uses and tenants under the Project, but also how noise from traffic would be impacted at various times of day.

For the purpose of modeling noise from on-road vehicles, it was assumed that the vehicle mix would remain the same as under the existing conditions. These assumptions are consistent with those in the traffic report. Tables 4.10-11 through 4.10-14 illustrate the anticipated weekday and Saturday noise increases on local roads due to implementation of the Project for baseline and long range scenarios. Noise increases on Freeways would be negligible, as project traffic would be a fraction of traffic on the Freeways, not resulting in a substantial noise increase due to additional traffic.

As shown in Tables 4.10-11 through 4.10-14, in no scenario would implementation of the Project result in noise level increases greater than 1.2 dBA. Therefore, the Project would not exceed the threshold of a 3 dBA increase, and would result in less-than-significant impacts.

Applicable Regulations:

- City of Daly City 2030 General Plan Noise Element
- City of Daly City Municipal Code

Significance Before Mitigation: Less than significant.

NOISE-4	**The Project would not result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the Project.**

Development of the Project would have a significant impact if it would result in a substantial temporary or periodic increase in ambient noise levels in the Project vicinity. Noise from construction equipment and various construction-related activities is frequently a cause of temporary or periodic increases in ambient noise levels. Temporary or periodic increases in ambient noise levels under the Project would chiefly result from construction activities associated with demolition and construction. Table 4.10-15 below shows typical noise levels generated by commonly-used pieces of construction equipment.

As mentioned above in *Short-Term Construction Vibration Impacts,* Project demolition and construction would take place would take place periodically over the ten-year buildout timeline. The timeline is intended to provide flexibility and allow the Shopping Center to be responsive to market needs and development trends. Any construction-related noise would be therefore most likely be limited to this timeframe and would also be limited geographically to the areas closest to the loudest construction activities. Construction activities are planned to include demolition, site preparation work, grading, building construction, and paving.

The apartments across Callan Boulevard are the closest noise-sensitive receptors to the construction of new buildings at a distance of 175 feet. Other nearby noise-sensitive receptors include the apartments on Philip Drive (475 feet from nearest construction), Serra Commons Apartments (550 feet), residences on Clarinada Avenue (600 feet), homes on Cerro Drive (700 feet), and apartments on Innisfree Drive (750 feet). Table 4.10-16 below presents the noise levels that can be expected at the closest receptors to the Project site when construction activities are taking place at the area of the Project site nearest to the respective receptors.

TABLE 4.10-11 BASELINE CONDITIONS PROJECT OFF-SITE CONTRIBUTIONS – WEEKDAY

		CNEL at 50 Feet (dBA)			
Roadway	Segment	No Project	With Project	Project Contribution	Potential Impact?
Clarinada Avenue	St Francis Boulevard to ramps	64.1	64.2	0.1	no
Clarinada Avenue	Ramps to Callan Boulevard	63.7	64.5	0.8	no
Callan Boulevard	Southgate Avenue to Clarinada Avenue	64.10	65.6	0.7	no
Callan Boulevard	Clarinada Avenue to Serramonte Boulevard	65.5	66.1	0.6	no
Serramonte Boulevard	St Francis Boulevard to ramps	62.7	62.7	0.0	no
Serramonte Boulevard	Ramps to Callan Boulevard	63.1	62.8	-0.3	no
Serramonte Boulevard	Callan Boulevard to entrance (Target)	64.4	64.10	0.5	no
Serramonte Boulevard	Entrance (Target) to Gellert Boulevard	65.2	66.1	0.9	no
Serramonte Boulevard	Gellert Boulevard to off-ramp	68.4	68.8	0.4	no
Serramonte Boulevard	Off-ramp to on-ramp	68.2	68.5	0.3	no
Serramonte Boulevard	On-ramp to Junipero Serra Boulevard	67.1	67.4	0.3	no
Gellert Boulevard	Serramonte Boulevard to Hickey Boulevard	70.2	70.9	0.7	no
Callan Boulevard	Serramonte Boulevard to Hickey Boulevard	63.5	63.6	0.1	no
Junipero Serra Boulevard	Southgate Avenue to Serramonte Boulevard	70.0	70.0	0.0	no
Junipero Serra Boulevard	Serramonte Boulevard to Hickey Boulevard	70.3	70.6	0.3	no
Hickey Boulevard	Skyline Boulevard to Callan Boulevard	67.4	67.5	0.1	no

Notes: Traffic noise contour calculations included in Appendix E.
Source: PlaceWorks, 2015.

The Daly City Municipal Code contains no provisions related to construction hours or noise levels. However, Project construction will follow all applicable regulations set forth in Title 15, Buildings and Construction, of the Municipal Code.

Due to proximity, some areas within the Shopping Center may be exposed to high noise levels.

Buildings on the Project site that would be in use during construction activities would be exposed to higher noise levels than off-site receptors. However, as the commercial uses on the Project site are not considered noise-sensitive, no significant impacts would occur.

TABLE 4.10-12 BASELINE CONDITIONS PROJECT OFF-SITE CONTRIBUTIONS - SATURDAY

		CNEL at 50 feet (dBA)			
Roadway	Segment	No Project	With Project	Project Contribution	Potential Impact?
Clarinada Avenue	St Francis Boulevard to ramps	62.1	62.3	0.2	no
Clarinada Avenue	Ramps to Callan Boulevard	63.0	63.7	0.7	no
Callan Boulevard	Southgate Avenue to Clarinada Avenue	63.9	64.7	0.8	no
Callan Boulevard	Clarinada Avenue to Serramonte Boulevard	64.7	65.5	0.8	no
Serramonte Boulevard	St Francis Boulevard to ramps	62.5	62.5	0.0	no
Serramonte Boulevard	Ramps to Callan Boulevard	63.7	64.2	0.5	no
Serramonte Boulevard	Callan Boulevard to entrance (Target)	64.5	65.1	0.6	no
Serramonte Boulevard	Entrance (Target) to Gellert Boulevard	66.3	66.7	0.4	no
Serramonte Boulevard	Gellert Boulevard to off-ramp	69.5	69.8	0.3	no
Serramonte Boulevard	Off-ramp to on-ramp	69.4	69.6	0.2	no
Serramonte Boulevard	On-ramp to Junipero Serra Boulevard	68.2	68.5	0.3	no
Gellert Boulevard	Serramonte Boulevard to Hickey Boulevard	71.8	72.2	0.4	no
Callan Boulevard	Serramonte Boulevard to Hickey Boulevard	63.1	63.2	0.1	no
Junipero Serra Boulevard	Southgate Avenue to Serramonte Boulevard	71.0	71.0	0.0	no
Junipero Serra Boulevard	Serramonte Boulevard to Hickey Boulevard	70.5	70.8	0.3	no
Hickey Boulevard	Skyline Boulevard to Callan Boulevard	67.1	67.2	0.1	no

Notes: Traffic noise contour calculations included in Appendix E.
Source: PlaceWorks, 2015.

The apartments across Callan Drive are located approximately 250 feet from Highway 1 from the construction site of the proposed medical offices in the southwest corner of the site. Due to proximity to the freeway, the nearest apartments are exposed to ambient noise levels above 70 dBA CNEL. Without the effects of topography, construction and demolition activities could produce an average noise level of 69 dBA during the loudest construction phases of demolition and grading, and a maximum noise levels up to 79 dBA L_{max}. It shall be noted that the construction site for the medical offices on the southwest corner is at a lower elevation than the apartments. The topography would provide shielding, greatly reducing noise levels from construction equipment at the project site, so the estimated noise levels would be less than the levels presented above. Due to distance and shielding provided by topography, noise from construction activities would not

TABLE 4.10-13 LONG RANGE CONDITIONS PROJECT OFF-SITE CONTRIBUTIONS - WEEKDAY

		CNEL at 50 feet (dBA)			
Roadway	Segment	No Project	With Project	Project Contribution	Potential Impact?
Clarinada Avenue	St Francis Boulevard to ramps	64.3	64.5	0.2	no
Clarinada Avenue	ramps to Callan Boulevard	65.1	65.7	0.6	no
Callan Boulevard	Southgate Avenue to Clarinada Avenue	65.3	66.5	1.2	no
Callan Boulevard	Clarinada Avenue to Serramonte Boulevard	66.5	67.0	0.5	no
Serramonte Boulevard	St Francis Boulevard to ramps	64.6	64.6	0.0	no
Serramonte Boulevard	ramps to Callan Boulevard	65.1	65.4	0.3	no
Serramonte Boulevard	Callan Boulevard to entrance (Target)	66.3	66.7	0.4	no
Serramonte Boulevard	entrance (Target) to Gellert Boulevard	66.9	67.5	0.6	no
Serramonte Boulevard	Gellert Boulevard to off-ramp	69.2	69.5	0.3	no
Serramonte Boulevard	off-ramp to on-ramp	69.2	69.4	0.2	no
Serramonte Boulevard	on-ramp to Junipero Serra Boulevard	68.3	68.6	0.3	no
Gellert Boulevard	Serramonte Boulevard to Hickey Boulevard	71.3	71.8	0.5	no
Callan Boulevard	Serramonte Boulevard to Hickey Boulevard	63.7	63.7	0.0	no
Junipero Serra Boulevard	Southgate Avenue to Serramonte Boulevard	70.4	70.5	0.1	no
Junipero Serra Boulevard	Serramonte Boulevard to Hickey Boulevard	71.8	71.9	0.1	no
Hickey Boulevard	Skyline Boulevard to Callan Boulevard	68.2	68.2	0.0	no

Notes: Traffic noise contour calculations included in Appendix E.
Source: PlaceWorks, 2015.

expose noise-sensitive receptors to noise levels significantly higher than ambient noise levels. Impacts would be less than significant at this receptor.

Apartments along Philip Drive are less than 200 feet from I-280, and would have ambient noise levels above 75 dBA CNEL. As construction and demolition activities would occur at distance of approximately 475 feet away, they would produce maximum noise levels up to 70 dBA L_{max} at the nearest receptors. As noise from construction would dissipate with distance to the nearest receptors at 475 feet away, and because traffic noise from Interstate 280 would overshadow noise from construction activities, noise impacts at that location would be less than significant.

TABLE 4.10-14 LONG RANGE CONDITIONS PROJECT OFF-SITE CONTRIBUTIONS - SATURDAY

		CNEL at 50 feet (dBA)			
Roadway	Segment	No Project	With Project	Project Contribution	Potential Impact?
Clarinada Avenue	St Francis Boulevard to ramps	62.4	62.6	0.2	no
Clarinada Avenue	ramps to Callan Boulevard	64.3	64.10	0.6	no
Callan Boulevard	Southgate Avenue to Clarinada Avenue	64.3	65.0	0.7	no
Callan Boulevard	Clarinada Avenue to Serramonte Boulevard	65.8	66.3	0.5	no
Serramonte Boulevard	St Francis Boulevard to ramps	64.4	64.4	0.0	no
Serramonte Boulevard	ramps to Callan Boulevard	65.7	66.0	0.3	no
Serramonte Boulevard	Callan Boulevard to entrance (Target)	66.7	67.0	0.3	no
Serramonte Boulevard	entrance (Target) to Gellert Boulevard	67.9	68.2	0.3	no
Serramonte Boulevard	Gellert Boulevard to off-ramp	70.2	70.5	0.3	no
Serramonte Boulevard	off-ramp to on-ramp	70.3	70.5	0.2	no
Serramonte Boulevard	on-ramp to Junipero Serra Boulevard	69.6	69.6	0.0	no
Gellert Boulevard	Serramonte Boulevard to Hickey Boulevard	72.0	73.2	1.2	no
Callan Boulevard	Serramonte Boulevard to Hickey Boulevard	63.5	63.6	0.1	no
Junipero Serra Boulevard	Southgate Avenue to Serramonte Boulevard	71.5	71.5	0.0	no
Junipero Serra Boulevard	Serramonte Boulevard to Hickey Boulevard	72.1	72.3	0.2	no
Hickey Boulevard	Skyline Boulevard to Callan Boulevard	67.8	67.9	0.1	no

Notes: Traffic noise contour calculations included in Appendix E.
Source: PlaceWorks, 2015.

Given that construction activities would produce noise levels below ambient noise levels at other receptors located at 550 feet away and beyond from any construction site, and traffic noise would generally overshadow noise from construction activities, noise impacts from construction of other phases of the project would be less than significant.

Since construction and demolition activities would not result in substantial temporary or periodic increases to ambient noise levels at any noise-sensitive receptors in the Project vicinity, the impact would be less than significant.

TABLE 4.10-15 CONSTRUCTION EQUIPMENT NOISE EMISSION LEVELS

Construction Equipment	Typical Noise Level (Dba) at 50 Feet	Construction Equipment	Typical Noise Level (Dba) at 50 Feet
Air Compressor	81	Pile-Driver (Impact)	101
Backhoe	80	Pile-Driver (Sonic)	96
Ballast Equalizer	82	Pneumatic Tool	85
Ballast Tamper	83	Pump	76
Compactor	82	Rail Saw	90
Concrete Mixer	85	Rock Drill	98
Concrete Pump	71	Roller	74
Concrete Vibrator	76	Saw	76
Crane, Derrick	88	Scarifier	83
Crane, Mobile	83	Scraper	89
Dozer	85	Shovel	82
Generator	81	Spike Driver	77
Grader	85	Tie Cutter	84
Impact Wrench	85	Tie Handler	80
Jack Hammer	88	Tie Inserter	85
Loader	85	Truck	88
Paver	89		

Source: Federal Transit Administration, Transit Noise, and Vibration Impact Assessment, 2006.

TABLE 4.10-16 CONSTRUCTION NOISE LEVELS AT NEAREST NOISE-SENSITIVE RECEPTORS

	Distance To Receptor				
Noise Levels	Apartments across Callan Boulevard 175 Feet	Apartments along Phillip Drive 475 Feet	Serra Commons Apartments 550 Feet	Residences on Clarinada Avenue 600 Feet	Homes on Cerro Drive 700 Feet
Average (dBA L_{eq})	66-69	61-64	60-63	60-62	58-61
Maximum (dBA L_{max})	73-79	64-70	63-69	62-68	61-67

Notes: Conservative scenario not taking into account effects of topography.
Source: PlaceWorks, 2015.

Applicable Regulations:

- City of Daly City 2030 General Plan Noise Element
- City of Daly City Municipal Code Chapter 9.22, Disturbing the Peace
- City of Daly City Municipal Code Title 15 – Buildings and Construction

Significance Before Mitigation: Less than Significant.

4.10.4 CUMULATIVE IMPACTS

NOISE-5	**Implementation of the Project, in combination with past, present, and reasonably foreseeable projects, would not result in additional cumulatively considerable noise, or ground-borne noise and vibration impacts.**

Mobile Source Noise

Tables 4.10-17 and 4.10-18 show the weekday and Saturday overall noise level increases and project contributions.

The difference in traffic noise between the existing environment and long range 2035 conditions represents cumulative noise impacts, whereas the difference between the Without Project and With Project conditions represents the project's contribution to cumulative noise increases. Project-related cumulative noise impacts may occur if the project's contribution to cumulative noise increases results in a substantial noise increase greater than 3 dBA in comparison to existing conditions, and the overall increase (long term – existing) is greater than 5 dBA. As illustrated in Tables 4.10-17 and 4.10-18, none of the roadways in the Project vicinity, including those which directly serve parking area drive ways, would experience an increase in ambient noise levels equal to or greater than 3 dBA, even under the most conservative assumptions.

Stationary Source Noise

Unlike transportation noise sources, whose effects can extend well beyond the limits of the Project site, stationary noise generated by the project is limited to impacts to noise-sensitive receptors adjacent to the project site. As no noise-sensitive uses are located adjacent to the project site, and no significant stationary noise impacts from project implementation were identified and the City Daly City restricts stationary noise generated on a property from creating a nuisance to other noise-sensitive receptors, cumulative stationary source noise generation would also be *less than significant*.

Construction Noise and Vibration

Like stationary source noise, cumulative construction noise and vibration impacts are confined to a localized area. Consequently, cumulative impacts would only occur if other projects are constructed in the vicinity of the project at the same time as the project. Although adjacent properties are developed, there is known project application for development

TABLE 4.10-17 WEEKDAY PROJECT CONTRIBUTIONS

		CNEL at 50 Feet (Dba)				
Roadway	Segment	Baseline	Long Range Plus Project	Overall Increase	Project Contribution	Potential Impact?
Clarinada Avenue	St Francis Boulevard to ramps	64.1	64.5	0.4	0.1	no
Clarinada Avenue	ramps to Callan Boulevard	63.7	65.7	1.9	0.8	no
Callan Boulevard	Southgate Avenue to Clarinada Avenue	64.10	66.5	1.6	0.7	no
Callan Boulevard	Clarinada Avenue to Serramonte Boulevard	65.5	67.0	1.5	0.6	no
Serramonte Boulevard	St Francis Boulevard to ramps	62.7	64.6	1.9	0.0	no
Serramonte Boulevard	ramps to Callan Boulevard	63.1	65.4	2.3	-0.3	no
Serramonte Boulevard	Callan Boulevard to entrance (Target)	64.4	66.7	2.3	0.5	no
Serramonte Boulevard	entrance (Target) to Gellert Boulevard	65.2	67.5	2.2	0.9	no
Serramonte Boulevard	Gellert Boulevard to off-ramp	68.4	69.5	1.1	0.4	no
Serramonte Boulevard	off-ramp to on-ramp	68.2	69.4	1.2	0.3	no
Serramonte Boulevard	on-ramp to Junipero Serra Boulevard	67.1	68.6	1.5	0.3	no
Gellert Boulevard	Serramonte Boulevard to Hickey Boulevard	70.2	71.8	1.6	0.7	no
Callan Boulevard	Serramonte Boulevard to Hickey Boulevard	63.5	63.7	0.2	0.1	no
Junipero Serra Boulevard	Southgate Avenue to Serramonte Boulevard	70.0	70.5	0.4	0.0	no
Junipero Serra Boulevard	Serramonte Boulevard to Hickey Boulevard	70.3	71.9	1.6	0.3	no
Hickey Boulevard	Skyline Boulevard to Callan Boulevard	67.4	68.2	0.8	0.1	no
Hickey Boulevard	Callan Boulevard to Gellert Boulevard	66.8	67.6	0.7	0.0	no
Hickey Boulevard	Gellert Boulevard to ramps	70.1	70.7	0.7	0.0	no

Notes: Traffic noise contour calculations included in Appendix E.
Source: PlaceWorks, 2015.

TABLE 4.10-18 SATURDAY PROJECT CONTRIBUTIONS

		CNEL at 50 Feet (Dba)				
Roadway	Segment	Baseline	Long-Range Plus Project	Overall Increase	Project Contribution	Potential Impact?
Clarinada Avenue	St Francis Boulevard to ramps	62.1	62.6	0.5	0.2	no
Clarinada Avenue	Ramps to Callan Boulevard	63.0	64.10	1.9	0.7	no
Callan Boulevard	Southgate Avenue to Clarinada Avenue	63.9	65.0	1.1	0.8	no
Callan Boulevard	Clarinada Avenue to Serramonte Boulevard	64.7	66.3	1.6	0.8	no
Serramonte Boulevard	St Francis Boulevard to ramps	62.5	64.4	2.0	0.0	no
Serramonte Boulevard	Ramps to Callan Boulevard	63.7	66.0	2.3	0.5	no
Serramonte Boulevard	Callan Boulevard to entrance (Target)	64.5	67.0	2.5	0.6	no
Serramonte Boulevard	Entrance (Target) to Gellert Boulevard	66.3	68.2	1.9	0.4	no
Serramonte Boulevard	Gellert Boulevard to off-ramp	69.5	70.5	1.0	0.3	no
Serramonte Boulevard	Off-ramp to on-ramp	69.4	70.5	1.1	0.2	no
Serramonte Boulevard	On-ramp to Junipero Serra Boulevard	68.2	69.6	1.4	0.3	no
Gellert Boulevard	Serramonte Boulevard to Hickey Boulevard	71.8	73.2	1.3	0.4	no
Callan Boulevard	Serramonte Boulevard to Hickey Boulevard	63.1	63.6	0.5	0.1	no
Junipero Serra Boulevard	Southgate Avenue to Serramonte Boulevard	71.0	71.5	0.5	0.0	no
Junipero Serra Boulevard	Serramonte Boulevard to Hickey Boulevard	70.5	72.3	1.8	0.3	no
Hickey Boulevard	Skyline Boulevard to Callan Boulevard	67.1	67.9	0.8	0.1	no
Hickey Boulevard	Callan Boulevard to Gellert Boulevard	66.8	67.4	0.6	0.0	no
Hickey Boulevard	Gellert Boulevard to ramps	70.2	70.8	0.6	0.0	no

Notes: Traffic noise contour calculations included in Appendix E.
Source: PlaceWorks, 2015.

that would occur concurrently with construction activities for implementation of the Project. Therefore, cumulative construction and vibration impacts would be *less than significant*.

Applicable Regulations:

- City of Daly City 2030 General Plan Noise Element
- Daly City Municipal Code Chapter 9.22, Disturbing the Peace

Significance Before Mitigation: Less than significant.

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