4.7 Noise

This section evaluates potential noise and groundborne vibration impacts that may result from the Housing Plan. Specifically, this analysis describes the environmental and regulatory setting, the criteria used to evaluate significance of potential noise impacts (including the exposure of noise-sensitive receivers to substantial or incompatible noise levels), methods used to evaluate potential impacts, and mitigation required to reduce potential impacts. Noise calculations associated with the analysis herein are included in Appendix E to this Program EIR.

4.7.1 Environmental Setting

a. Fundamentals of Noise

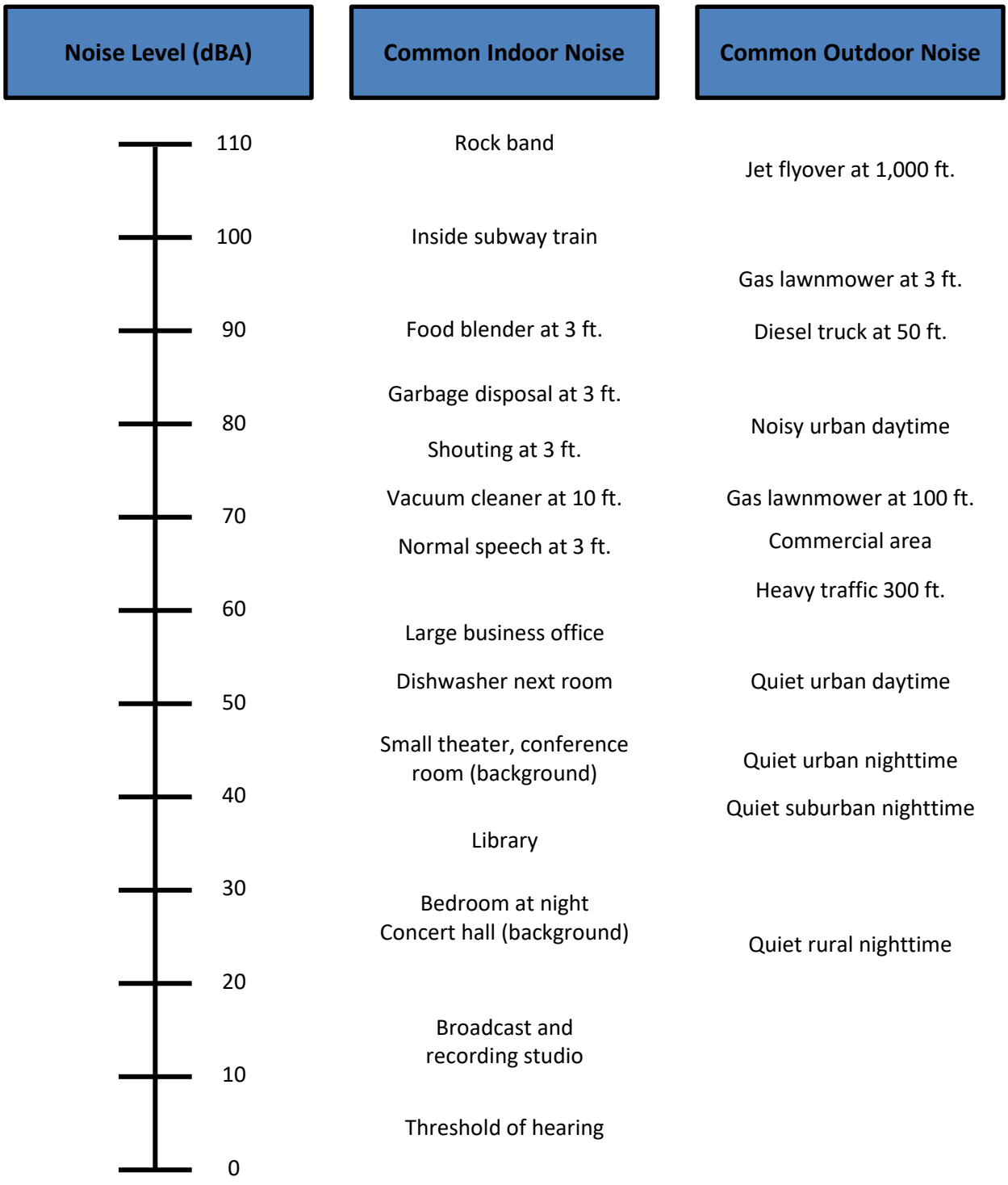
Sound is a vibratory disturbance created by a moving or vibrating source, which is capable of being detected by the hearing organs (e.g., the human ear). Noise is defined as sound that is loud, unpleasant, unexpected, or undesired and may therefore be classified as a more specific group of sounds. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance, and, in the extreme, hearing impairment (California Department of Transportation [Caltrans] 2013).

Noise levels are commonly measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound pressure levels so that they are consistent with the human hearing response, which is most sensitive to frequencies around 4,000 Hertz (Hz) and less sensitive to frequencies around and below 100 Hz (Kinsler, et. al. 1999). Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used to measure earthquake magnitudes. A doubling of the energy of a noise source, such as a doubling of traffic volume, would increase the noise level by 3 dB; similarly, dividing the energy in half would result in a decrease of 3 dB (Crocker 2007). Common outdoor and indoor noise sources and their typical corresponding A-weighted noise levels are shown in Figure 4.7-1.

Human perception of noise has no simple correlation with sound energy. The perception of sound is not linear in terms of dBA or in terms of sound energy. Two sources do not “sound twice as loud” as one source. It is widely accepted that the average healthy ear can barely perceive an increase (or decrease) of up to 3 dBA in noise levels (i.e., twice [or half] the sound energy); that a change of 5 dBA is readily perceptible (8 times the sound energy); and that an increase (or decrease) of 10 dBA sounds twice (or half) as loud (10.5 times the sound energy) (Crocker 2007).

Sound changes in both level and frequency spectrum as it travels from the source to the receiver. The most obvious change is the decrease in sound level as the distance from the source increases. The manner by which noise declines with distance depends on factors such as the type of sources (e.g., point or line), the path the sound will travel, site conditions, and obstructions. Noise levels from a point source (e.g., construction, industrial machinery, ventilation units) typically attenuate, or drop off, at a rate of 6 dBA per doubling of distance. Noise from a line source (e.g., roadway, pipeline, railroad) typically attenuates at about 3 dBA per doubling of distance (Caltrans 2013).

Figure 4.7-1 Examples of Typical Noise Levels



Source: Caltrans 2013

The propagation of noise is also affected by the intervening ground, known as ground absorption. A hard site, such as a parking lot or smooth body of water, receives no additional ground attenuation and the changes in noise levels with distance (drop-off rate) result simply from the geometric spreading of the source. An additional ground attenuation value of 1.5 dBA per doubling of distance applies to a soft site (e.g., soft dirt, grass, or scattered bushes and trees) (Caltrans 2013).

Noise levels may also be reduced by intervening structures. The amount of attenuation provided by this "shielding" depends on the size of the object and the frequencies of the noise levels. Natural terrain features, such as hills and dense woods, and man-made features, such as buildings and walls, can alter noise levels. Generally, any large structure blocking the line of sight will provide at least a 5 dBA reduction in source noise levels at the receiver (Federal Highway Administration [FHWA] 2011). Structures can substantially reduce occupants' exposure to noise as well. The FHWA's guidelines indicate that modern building construction generally provides an exterior-to-interior noise level reduction of 20 to 35 dBA with closed windows.

Descriptors

The impact of noise is not a function of loudness alone. The time of day when noise occurs, its frequency, and the duration of the noise are also important. In addition, most noise that lasts for more than a few seconds is variable in its intensity. Consequently, a variety of noise descriptors have been developed.

One of the most frequently used noise metrics that considers both duration and intensity is the equivalent noise level (L_{eq}). The L_{eq} is defined as the single steady A-weighted level that is equivalent to the same amount of energy as that contained in the actual fluctuating levels over a period of time. Typically, L_{eq} is equivalent to a one-hour period, even when measured for shorter durations as the noise level of a 10- to 30-minute period would be the same as the hour if the noise source is relatively steady. Normal conversational levels at three feet are in the 60- to 65-dBA L_{eq} range and ambient noise levels greater than 65 dBA L_{eq} can interrupt conversations (Federal Transit Administration [FTA] 2018).

Noise that occurs at night tends to be more disturbing than that which occurs during the day. Community noise is usually measured using Day-Night Average Level (Ldn), which is a 24-hour average noise level with a +10 dBA penalty for noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours, or Community Noise Equivalent Level (CNEL), which is the 24-hour average noise level with a +5 dBA penalty for noise occurring from 7:00 p.m. to 10:00 p.m. and a +10 dBA penalty for noise occurring from 10:00 p.m. to 7:00 a.m. (Caltrans 2013). Noise levels described by Ldn and CNEL usually differ by about 0.5 dBA. Quiet suburban areas typically have a CNEL in the range of 40 to 50 dBA, while areas near arterial streets are typically in the 50 to 70+ CNEL range.

Propagation

Sound from small, localized sources (approximating a "point" source) radiates uniformly outward as it travels away from the source in a spherical pattern, known as geometric spreading. The sound level from point sources attenuates at a rate of approximately 6 dBA for each doubling of distance.

Traffic noise is not a single, stationary point source of sound. Rather, the movement of vehicles makes the source of the sound appear to emanate from a line (line source) rather than a point. The attenuation rate for a line source is approximately 3 dBA for each doubling of distance.

b. Fundamentals of Vibration

Groundborne vibration of concern in environmental analysis consists of the oscillatory waves that move from a source through the ground to adjacent structures. The number of cycles per second of oscillation makes up the vibration frequency, described in terms of hertz (Hz). The frequency of a vibrating object describes how rapidly it oscillates.

Descriptors

Vibration amplitudes are usually expressed in peak particle velocity (PPV). The PPV is normally described in inches per second (in/sec). PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is often used in monitoring of vibration because it is related to the stresses that are experienced by buildings (Caltrans 2020).

Response to Vibration

Caltrans has developed limits for the assessment of vibrations from transportation and construction sources. The Caltrans vibration limits are reflective of standard practice for analyzing vibration impacts on structures. The Caltrans *Transportation and Construction Vibration Guidance Manual* (2020) identifies guideline impact criteria for damage to buildings, which are shown in Table 4.7-1.

Table 4.7-1 Building Vibration Damage Potential

	Maximum PPV (in/sec)	
Structure and Condition	**Transient Sources**	**Continuous/Frequent Intermittent Sources**
Extremely fragile historic buildings, ruins, ancient mountains	0.12	0.08
Fragile buildings	0.20	0.10
Historic and similar old buildings	0.50	0.25
Older residential structures	0.50	0.30
New residential structures	1.00	0.50
Modern industrial/commercial buildings	2.00	0.50

Notes: Transient sources create a single isolated vibration event, such as blasting or drop balls (i.e., a loose steel ball that is dropped onto structures or rock to reduce them to a manageable size). Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

PPV = peak particle velocity; in/sec = inches per second

Source: Caltrans 2020

Propagation

Vibration energy spreads out as it travels through the ground, causing the vibration level to diminish with distance away from the source. High-frequency vibrations diminish much more rapidly than low frequencies, so low frequencies tend to dominate the spectrum at large distances from the source. Variability in the soil strata can also cause diffractions or channeling effects that affect the propagation of vibration over long distances (Caltrans 2020). When a building is exposed to vibration, a ground-to-foundation coupling loss (the loss that occurs when energy is transferred from one medium to another) will usually reduce the overall vibration level. However, under rare circumstances, the ground-to-foundation coupling may amplify the vibration level due to structural resonances of the floors and walls.

c. Sensitive Receivers

Noise-sensitive receivers are generally uses that are most interfered with by noise. These uses include residences, schools, churches, hotels, as well as some park and open space areas (City of Santa Barbara 2010). The City predominantly consists of land that is designated for residential uses, and residential land uses are also allowed in most commercial zone districts. Therefore, residential uses comprise most of the noise-sensitive receivers in the City.

Vibration-sensitive receivers are similar to noise-sensitive receivers and include residences and institutional uses, such as schools and churches. However, vibration-sensitive receivers may include sensitive species and any use where groundborne vibration may result in physical damage to a building structure. Uses that may have added sensitivity to groundborne vibration include historic sites and structures. Refer to Section 4.4, *Cultural and Tribal Cultural Resources*, for a discussion of historic properties in the City, which may be particularly sensitive to increases in groundborne vibration levels due to the possibility for these properties to have aging architecture and/or infrastructure.

d. Existing Conditions

Noise Sources

The noise environment in Santa Barbara is predominantly characterized by transportation sources: vehicles, freight and passenger trains, and aircraft overflights. Vehicle noise affects large areas of the city along major transportation corridors, particularly communities near U.S. Route 101 (U.S. 101), which generates noise levels at or above 70 dBA Ldn generally extending out between 250 and 300 feet from the corridor. Major roadways that generate noise between 65-69 dBA Ldn include Upper State Street, Las Positas Road, and Cabrillo Boulevard, whereas roadways that generate noise between 60-64 dBA Ldn include those within the City's Downtown and Mesa neighborhoods. Freight and passenger train operations intermittently generate high noise levels often exceeding 100 dBA at 100 feet from the track centerline. For instance, portions of U.S. 101 noise overlap that associated with the Union Pacific Railroad (UPRR), which intermittently increases noise exposure at communities near these portions of the corridor. Aircraft overflights also intermittently create higher noise levels citywide. However, the nearest airport is Santa Barbara Airport, which is within the City limits but located in the Goleta area approximately four miles west of City proper as shown in Figure 2-1 and Figure 2-2 in Section 2, *Environmental Setting*. The airport's 65 dBA CNEL noise contour extends approximately 3,000 feet east of the airport which does not reach City proper, located adjacent to La Cumbre Country Club (City of Santa Barbara 2010).

The 2010 General Plan EIR includes a noise contour map depicting the extent of noise exposure in the City above 60 dBA Ldn with respect to various noise-sensitive uses, predominantly residential uses. Roadway volumes have incrementally increased since the development of the noise contour map circa 2010; however, volumes have not increased substantially such that the contours depicted have changed fundamentally since 2010. Therefore, the noise contour map remains an applicable and relevant resource for this analysis. Figure 4.7-2 depicts modeled 60-65, 65-70, and 70+ dBA Ldn noise contours representative of existing conditions. The extent to which existing land uses in Santa Barbara are affected by traffic noise depends on their respective proximity to major roadways and their individual sensitivity to noise.

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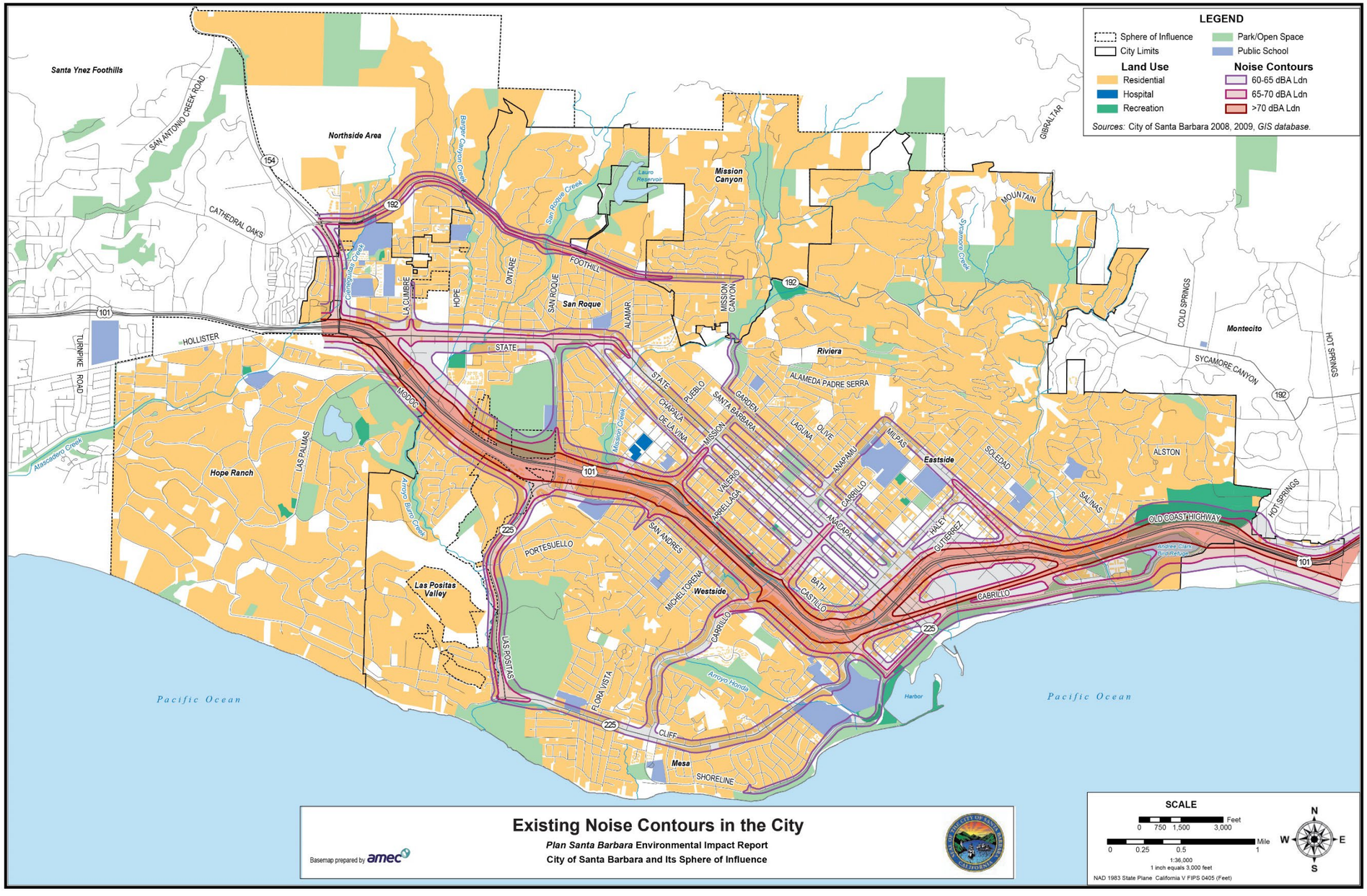
Figure 4.7-2 Existing Noise Contours in the City



Source: City of Santa Barbara 2010

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As shown in Figure 4.7-2, land uses with proximity to the following roadways and railroad are generally exposed to noise levels between 60 and 70 dBA Ldn (City of Santa Barbara 2010):

- U.S. 101
- State Route 154 (SR 154)
- Cliff Drive
- Foothill Road
- Milpas Street
- Las Positas Road
- State Street
- Mission Street
- De La Vina Street
- Chapala Street
- La Cumbre Road
- Anacapa Street
- Carrillo Street
- Garden Street
- Cabrillo Boulevard
- UPRR

Vibration Sources

Sources of vibration in the city, similar to that of the noise environment, are also primarily motor vehicles along roadways. Heavy truck traffic and bus operations on roadways generate groundborne vibration, which varies depending on vehicle type, weight, and pavement conditions. In addition, commercial or industrial activities may generate vibration from the use of heavy equipment. More permanent, but intermittent, vibration may also be generated by railroad and airport operations, which would affect communities adjacent to these facilities. Vibration may also be generated by construction equipment (e.g., earth-moving equipment and pile driving); however, these sources are temporary and vary on a project-by-project basis.

4.7.2 Regulatory Setting

a. Federal Regulations

Occupational Safety and Health Act of 1970

Under the Occupational Safety and Health Act of 1970, the Occupational Safety and Health Administration (OSHA) has adopted regulations designed to protect workers against the effects of occupational noise exposure. These regulations list permissible noise level exposure as a function of the amount of time during which the worker is exposed. The regulations further specify a hearing conservation program that involves monitoring noise to which workers are exposed, ensuring that workers are made aware of overexposure to noise, and periodically testing the workers' hearing to detect any degradation.

b. State Regulations

The State noise and vibration guidelines presented below are to be used as guidance with respect to planning for noise, not standards and/or regulations to which Santa Barbara must adhere.

California Building Standards Code, Title 24, Part 2, Section 1206.4

According to the 2022 California Building Standards Code, Title 24, Part 2, Section 1206.4 (Allowable Interior Noise Levels) of the California Code of Regulations, interior noise levels attributable to exterior sources shall not exceed 45 dBA Ldn in any habitable room. A habitable room is typically a residential room used for living, sleeping, eating, or cooking. Bathrooms, closets, hallways, utility spaces, and similar areas are not considered habitable rooms for this regulation.

California Department of Transportation

As discussed in the *Environmental Setting* of this section, Caltrans has developed limits for the assessment of vibration from transportation and construction sources, which are reflective of standard practice for analyzing vibration impacts. Table 4.7-1 presents the impact criteria for structural damage to buildings.

c. Local Regulations

City of Santa Barbara General Plan

The Environmental Resources Element of the City's General Plan, which incorporates the 1979 Noise Element, is intended to identify sources of noise and provide goals, objectives, and policies that ensure that noise from various sources, including transportation and stationary sources, does not create an unacceptable noise environment. The City has adopted land use compatibility standards for use in assessing the compatibility of various land use types with noise levels. The City's adopted land use compatibility standards, shown in Table 4.7-2, indicate that the normally acceptable exterior noise level for residential uses is 65 dBA Ldn. The guidelines also identify 45 dBA Ldn as the acceptable interior noise level for residential uses, consistent with the 2022 California Building Standards Code (City of Santa Barbara 2011).

Table 4.7-2 Land Use Compatibility Standards

Land Use Category	Normally Acceptable Exterior Noise Exposure[1] (Ldn dBA)
Residential – Single Family, Duplex, Mobile Homes, Multiple Family, Dormitories, etc.	65
Transient Lodging	70
Schools Classrooms, Libraries, Churches	65
Hospitals, Nursing Homes	65
Auditoriums, Concert Halls, Music Shells	60
Sports Arenas, Outdoor Spectator Sports	65
Playgrounds, Neighborhood Parks	65
Gold Courses, Riding Stables, Water Recreation, Cemeteries	70
Office Buildings, Personal, Business, and Professional	75
Commercial – Retail, Movie Theaters, Restaurants	75
Commercial – Wholesale, Some Retail Industry, Manufacturing, Utilities	80
Manufacturing – Communications (Noise Sensitive)	70
Livestock Farming, Animal Breeding	75
Agriculture (except Livestock), Mining, Fishing	95
Public Right-of-Way	85
Extensive Natural Recreation Areas	75

[1] Represent the upper limit of the range of "normally acceptable" noise levels. "Normally acceptable" is defined as being an exposure that is great enough to be of some concern, but common building constructions will make the indoor environment acceptable, even for sleeping quarters.

Source: City of Santa Barbara 2011

In addition to the City's compatibility noise standards, the following policies and implementation actions from the Environmental Resources Element are consistent with the City's overarching goal to ensure that the City is free from excessive noise, and therefore applicable to the Housing Plan (City of Santa Barbara 2011):

Policies

- **3.0:** Existing and potential incompatible noise levels in problem areas should be reduced through land use planning, building, and subdivision code enforcement and other administrative means.
- **5.0:** A program should be developed for the education of the community in the nature and extent of noise problems in the City.

Implementation Measures

- **3.1:** Locate proposed developments in the City on the Noise Contour Map to determine if there is a potential impact on the development or, conversely, if the development will increase noise levels in a relatively quiet area. The development review and environmental review process should include further analysis in areas of potential impact.
- **3.2:** Discourage development of noise sensitive uses in incompatible noise-impacted areas, particularly adjacent to Highway 101, the Municipal Airport, and the Southern Pacific Railroad.
- **3.3:** Strictly enforce all existing noise control regulations, including building and subdivision laws.
- **3.4:** In existing or future development in noise-impacted areas, especially surrounding the Municipal Airport, encourage or require through ordinance that proper site planning and insulation measures be taken to reduce noise to establish levels.
- **3.5:** Require public housing constructed in noise conflict areas to incorporate noise attenuation measures in site design and construction techniques and materials such that HUD guidelines are met.
- **5.1:** Develop an information release program to familiarize residents of Santa Barbara with the Noise Element and noise problems in general. Special attention should be paid to identifying and informing those people now residing or working in noise problem areas.
- **5.2:** Provide developers and builders with specific design information to reduce noise levels in new and existing developments.
- **5.3:** As part of the permit application process, inform developers and building contractors about potential construction noise problems and measures to reduce construction noise.

The General Plan Environmental Resources Element contains an additional policy and implementation measures applicable to the Housing Plan (City of Santa Barbara 2011):

Policy

- **ER31: Noise Policies for New Residential Uses.** Take into consideration the surrounding existing and future legal land uses in establishing exterior noise policies for new residential uses.

Possible Implementation Actions to be Considered

- **ER31.1: Residential Exterior Ambient Nosie Levels in Non-Residential and Multi-Family Zones.** An average ambient outdoor noise level of 65 dBA Ldn or CNEL or less is established as the level considered normally acceptable for required outdoor living areas of residential units located

within non-residential and multi-family zones. This policy amends the General Plan Noise Element Land Use Compatibility Guidelines for residential units in non-residential and multi-family zones.

- **ER31.2: Residential Exterior Ambient Nosie Levels in Single-Family Zones.** An average ambient outdoor noise level of 60 dBA Ldn or CNEL or less is established as the level considered normally acceptable for required outdoor living areas of residential units located within single-family zones except for areas subject to higher ambient noise levels, for which a 65 dBA Ldn or CNEL standard is established. This policy amends the General Plan Noise Element Land Use Compatibility Guidelines for residential units in single-family zones that already experience average ambient noise levels above 60 dBA.
- **ER31.3: Subdivisions in Single-Family Zones.** Subdivisions may be permitted in areas where the existing average ambient noise level exceeds 60 dBA Ldn or CNEL only if it is demonstrated that required outdoor living areas can be provided with an exterior noise level of 60 dBA Ldn or CNEL or less.
- **ER31.4: Construction Noise.** Establish different construction noise standards for mixed-use urban and suburban residential areas, including standards for days, hours, and types of construction.
- **ER31.5: Non-Residential Noise Affecting Residential Neighborhoods.** To further General Plan policies for maintaining quiet, high quality neighborhoods, require more detailed noise assessments for proposed special, conditional, and institutional uses with episodic activities and events that may cause noise effects to residential neighborhoods.

City of Santa Barbara Municipal Code

The City's noise ordinance, found in Title 9, Chapter 9.16 of the City of Santa Barbara Municipal Code, regulates short-term or periodic nuisance noise from existing uses and is enforced by the City's Police Department. The ordinance addresses construction noise, use of mechanical equipment, and amplified sound, and identifies general factors considered in determining whether a noise violation has occurred (volume, duration, proximity to sensitive receivers, etc.).

According to Municipal Code Section 9.16.020, no person shall make, continue or cause to be made or continued, or permit or allow to be made or continued, any noise disturbance in such a manner as to be plainly audible by a person of ordinary sensitivity at a distance of 50 feet from the noise source.

As described in Municipal Code Section 9.16.040, it is unlawful for any person, between the hours of 8:00 p.m. of any day and 7:00 a.m. of the following day to construct, demolish, excavate for, alter, or repair any building or structure unless a special permit has been applied for and granted by the Chief Building Official.

With respect to leaf blower equipment, Municipal Code Section 9.16.050 prohibits the operation of a leaf blower within 250 feet of any residential zone before 9:00 a.m. or after 5:00 p.m. Monday through Saturday, or at any time on Sundays or national holidays. Furthermore, Municipal Code Section 9.16.060 prohibits any person within the City to use or operate any portable machine powered with a gasoline engine, or gasoline-powered generator, to blow leaves, dirt, and other debris off sidewalks, driveways, lawns, or other surfaces.

As described in Municipal Code Section 9.16.070, noise from all mechanical equipment buildings, including Heating, Ventilation, and Air Conditioning (HVAC) shall not exceed 53 dBA at the property line of any adjacent parcel used or zoned for residential, public, or semi-public uses.

4.7.3 Impact Analysis

a. Methodology and Significance Thresholds

Significance Thresholds

The City's environmental checklist and Appendix G of the *CEQA Guidelines* state a project may have a significant adverse impact if it would:

1. Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
2. Generate excessive groundborne vibration or groundborne noise levels.
3. Site a land use in an area with noise levels exceeding City General Plan noise policies and land use compatibility guidelines; or
4. For a project located within the vicinity of a private airstrip or Santa Barbara County Association of Governments (SBCAG) Airport Land Use Plan/Airport Influence Area, expose people residing or working in the project area to excessive noise levels.

Construction Noise

The City has not adopted noise level criteria for assessing potential construction impacts. Therefore, the impact discussion concerning construction noise is based on a qualitative analysis of the potential for construction noise to cause a temporary increase in ambient noise levels. According to Municipal Code Section 9.16.040 it is unlawful for any person, between the hours of 8:00 p.m. of any day and 7:00 a.m. of the following day to construct, demolish, excavate for, alter, or repair any building or structure unless a special permit has been applied for and granted by the Chief Building Official. Therefore, nighttime construction noise is not discussed further in this section.

Operational Noise

The City has adopted noise standards in their Municipal Code that regulate on-site operational noise sources in the City. The Housing Plan would result in a significant impact if buildout of forecasted residential development may generate noise from on-site sources in excess of standards included in the City's noise ordinance (i.e., Municipal Code Chapter 9.16), which regulates noise from operations that are typical to residential uses (e.g., HVAC equipment, sound-amplifying devices, lawn maintenance equipment, house pets, outdoor activities). Off-site operational noise (i.e., traffic noise) would result in a significant impact if buildout of forecasted residential development would cause a perceptible increase (3 dBA or greater) in the ambient noise level measured at the property line of affected uses.

Groundborne Vibration

The City has not adopted a significance threshold to assess vibration impacts. Therefore, this analysis uses the Caltrans *Transportation and Construction Vibration Guidance Manual* (2020) to evaluate potential vibration impacts on adjacent and nearby structures shown in Table 4.7-1. Vibration impacts would be significant if vibration levels would exceed 0.5 in/sec PPV at modern industrial/commercial/residential structures or 0.3 in/sec PPV at older residential structures, which is the limit where minor cosmetic (i.e., non-structural) damage could typically occur to these types

of structures. Construction vibration impacts would also be significant if vibration levels exceed 0.25 in/sec PPV for historic and similar older structures (Caltrans 2020).

Land Use Compatibility

According to the City's original land use compatibility standards shown in Table 4.7-2, ambient noise up to 60 dBA Ldn was considered normally acceptable for all residential uses prior to the 2011 General Plan update (City of Santa Barbara 2010). Environmental Resources Element Policy ER31 (Noise Policies for New Residential Uses), effectively amended the City's land use compatibility standard for various residential uses from 60 dBA Ldn to 65 dBA Ldn. Implementation Action ER31.1 established an outdoor noise level of 65 dBA Ldn as the level considered normally acceptable for required outdoor living areas of residential units located within non-residential and multi-family zones. Similarly, Implementation Action ER31.2 established an outdoor noise level of 65 dBA Ldn as the level considered normally acceptable for required outdoor living areas of residential units located within single-family zones subject to higher ambient noise levels above 60 dBA. The City's guidelines also identify 45 dBA Ldn as the acceptable interior noise level for residential uses, consistent with the 2022 California Building Standards Code (City of Santa Barbara 2011).

Methodology

The following discussion describes the methodology used to evaluate the significance of potential noise and vibration impacts from new residential development facilitated by the Housing Plan. Noise modeling results associated with the analysis herein are included in Appendix E to this PEIR.

Construction Noise

The primary source of temporary noise associated with the Housing Plan would be construction activities generated by new residential development. Construction equipment can be considered to operate in two modes: stationary and mobile. Stationary equipment operates in a single location for one or more days at a time, with either fixed-power operation (e.g., pumps, generators, and compressors) or variable-power operation (e.g., pile drivers, rock drills, and pavement breakers). Mobile equipment moves around a construction site with power applied in cyclic fashion, such as bulldozers, graders, and loaders. Each phase of construction has its own noise characteristics due to specific equipment mixes; some have higher continuous noise levels than others and some have high-impact intermittent noise levels. Therefore, construction noise levels fluctuate depending on the type of equipment being used, construction phase, or equipment location.

Based on the assumption that most residential development facilitated by the Housing Plan would be infill projects within developed urban areas, the size and location of the project would influence the required construction equipment, and related duration of construction activities. Regardless of site conditions, mass grading activities and/or foundation excavation work (i.e., use of pile driving) typically generate the highest noise levels related to the use of large equipment. Variation in power imposes additional complexity in characterizing the noise source level from construction equipment. Power variation is accounted for by describing the noise at a reference distance from the equipment operating at full power and adjusting it based on the duty cycle, or percent of operational time, of the activity to determine the L_{eq} of the operation (FTA 2018).

For assessment purposes, noise levels for common construction equipment provided in the FTA *Transit Noise and Vibration Impact Assessment* (2018) guidance document were used to analyze potential noise levels associated with forecasted residential development under the Housing Plan. The FTA provides typical noise levels at 50 feet from various types of equipment. Construction noise

was also estimated using the FHWA's Roadway Construction Noise Model (RCNM) (2006). RCNM predicts construction noise levels for a variety of construction operations based on empirical data and the application of acoustical propagation formulas. Using RCNM, potential construction noise levels were estimated at a distance of 50 feet from future development. Model results are included in Appendix E to this PEIR.

Operational Noise

Analysis of on-site operational activity (e.g., stationary heating, ventilation, and air conditioning [HVAC] equipment, delivery trucks, trash hauling, outdoor activities) considers the existing noise environment and refers to regulations included in the City's noise ordinance. Traffic noise impacts are analyzed based on a residential trip generation rate of 5.44 trips per dwelling unit, consistent with the Institute of Transportation Engineers' Trip Generation Manual, Tenth Edition.

Potential traffic noise impacts were estimated by comparing existing traffic conditions to projected year 2035 traffic conditions with projected residential development under the Housing Plan. Based on the City's RHNA, the maximum residential growth facilitated by the Housing Plan would be approximately 8,001 housing units through 2035. The City currently has a total of approximately 39,932 housing units. To determine a future scenario with implementation of the Housing Plan, the total number of housing units forecasted under the project (i.e., 8,001 units) was added to the existing 39,932 housing units, resulting in a total of 47,933 housing units by the year 2035. Due to the programmatic nature of the Housing Plan, the traffic noise analysis does not identify which City roadways would experience the highest traffic and noise increases associated with residential development. Any effort to specify concentrations of traffic and noise along City roadways would be speculative at this time. Therefore, this analysis assumes that the increase in traffic associated with residential development would be distributed evenly throughout the City's roadway network.

Groundborne Vibration

The Housing Plan would not directly result in new sources of long-term vibration (e.g., operation of stationary heavy equipment). However, construction or new residential uses facilitated by the Housing Plan would generate groundborne vibration that may affect structures adjacent to a construction site, especially during grading and when a construction site is located near a historic site or structure. As discussed in Section 4.4, *Cultural and Tribal Cultural Resources*, the City has designated several structures as City Landmarks and Structures of Merit. As of December 2022, there were 136 Designated City Landmarks, 458 Designated Structures of Merit, and 311 structures listed on the City's Historic Resources Inventory.

This analysis includes a quantitative assessment of potential vibration impacts from new residential construction activities using equations developed by Caltrans (Caltrans 2020). Table 4.7-3 shows typical vibration levels for various pieces of construction equipment used in the construction vibration assessment.

Table 4.7-3 Typical Vibration Levels for Construction Equipment

Equipment	PPV (in/sec) at 25 Feet
Pile Driver (Impact)	0.644
Pile Driver (Sonic)	0.170
Vibratory Roller	0.210
Hoe Ram	0.089
Large Bulldozer	0.089
Caisson Drilling	0.089
Loaded Truck	0.076
Jackhammer	0.035
Small Bulldozer	0.003

Sources: FTA 2018; Caltrans 2020

Because groundborne vibration can cause physical damage to structures and is measured in an instantaneous period, vibration impacts are typically modeled based on the distance from the location of vibration-intensive construction activities, which is conservatively assumed to be edge of a project site to the edge of the nearest off-site structures. For assessment purposes, vibration levels for construction equipment shown in Table 4.7-3 were modeled at various incremental distances between 25 feet and 125 feet to analyze potential vibration levels associated with forecasted residential development under the Housing Plan. Vibration calculations are included in Appendix E to this Program EIR.

Land Use Compatibility

Agencies subject to CEQA generally are not required to analyze the impact of existing environmental conditions on a project's future users or residents. In *California Building Industry Association v. Bay Area Air Quality Management District (2015) 62 Cal. 4th 369*, the California Supreme Court explained that an agency is only required to analyze the potential impacts to future residents if the project would exacerbate those existing environmental hazards or conditions. CEQA analysis is concerned with a project's impact on the environment, rather than with the environment's impact on a project and its users or residents. Therefore, bringing a population into an area where noise currently exists is not a significant environmental impact under CEQA unless doing so would exacerbate noise conditions. The analysis in this section regarding noise exposure to new residential development is provided for informational purposes and refers to the City's existing land use compatibility standards.

As discussed under *Noise Sources* of Section 4.8.1, *Environmental Setting*, the overall noise environment in Santa Barbara is predominantly characterized by transportation sources, predominantly traffic noise. Residential development forecasted under the Housing Plan would generate additional vehicle trips, thereby increasing off-site traffic on area roadways and potentially exacerbating existing conditions. This section evaluates the potential impacts of future growth on noise levels and noise-sensitive receivers within the City and surrounding area, including the establishment of noise-sensitive receivers adjacent to sources of traffic noise (e.g., transportation corridors).

b. Project Impacts and Mitigation Measures

Threshold 1:	Would the project result in generation of a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Impact N-1 CONSTRUCTION OF RESIDENTIAL DEVELOPMENT FORECASTED UNDER THE HOUSING PLAN MAY EXCEED APPLICABLE STANDARDS. MITIGATION MEASURE N-1 WOULD MANDATE IMPLEMENTATION OF A CONSTRUCTION NOISE MANAGEMENT PLAN FOR PROJECTS WITH CONSTRUCTION ACTIVITIES THAT COULD IMPACT SENSITIVE RECEIVERS, MINIMIZING CONSTRUCTION NOISE ASSOCIATED WITH NEW RESIDENTIAL DEVELOPMENT AND RESULTING IN A LESS THAN SIGNIFICANT IMPACT.

Construction activity associated with development facilitated by the Housing Plan would require the use of noise-generating equipment that would result in temporary increases in ambient noise levels near future construction locations. Noise levels would fluctuate depending on the construction phase, equipment type and duration of use, distance between the noise source and receiver, and presence or absence of noise attenuation barriers. Typical noise levels at 50 feet from various types of equipment that may be used during construction are listed in Table 4.7-4. The loudest noise levels are generated by impact equipment (e.g., pile drivers) and heavy-duty equipment (e.g., cranes, scrapers, and graders). Construction noise would occur intermittently throughout construction, and, in some cases, multiple pieces of equipment may operate simultaneously, generating overall noise levels that are incrementally higher than what is shown for individual pieces of equipment in Table 4.7-4.

Table 4.7-4 Construction Equipment Noise Levels

Equipment	Typical Noise Level (dBA) at 50 Feet from Source
Air Compressor	80
Backhoe	80
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Derrick	88
Crane, Mobile	83
Dozer	85
Generator	82
Grader	85
Jackhammer	88
Loader	80
Paver	85
Pile-driver (Impact)	101
Pile-driver (Sonic)	95
Pneumatic Tool	85
Pump	77

Equipment	Typical Noise Level (dBA) at 50 Feet from Source
Roller	85
Saw	76
Scarifier	83
Scraper	85
Shovel	82
Truck	84

Source: FTA 2018

Sensitive receivers are located throughout the City and could be exposed to noise associated with construction activities from forecasted residential development under the Housing Plan. Residential uses comprise most of the noise-sensitive receivers in the City. As shown in Table 4.7-4, sensitive receivers would be exposed to noise levels ranging from 76 to 88 dBA at 50 feet from typical construction equipment, and could reach as high as 101 dBA near construction projects that require the use of pile drivers. In addition, during construction of residential projects there would be additional traffic noise on roadways due to haul trucks carrying materials to and from the project site. Depending on the haul route utilized, haul trucks could potentially result in substantial noise increases to sensitive receptors in proximity to a haul route.

An excavator, dozer, and jackhammer are among equipment typically used for construction of residential development that would generate some of the highest noise levels during demolition and grading activities associated with typical residential construction projects in Santa Barbara, and, as such, are used in this analysis to provide a reasonable estimate of construction noise. Assuming construction would involve operation of multiple pieces of equipment at once, RCNM was used to estimate construction noise from the simultaneous use of an excavator, dozer, and jackhammer. Based on RCNM results, the combined noise level from an excavator, dozer, and jackhammer is estimated at 84 dBA L_{eq} at 50 feet from the source. Model results are included in Appendix E to this PEIR.

Engine noise reduction technology, including silencers, continues to improve, but heavy construction equipment still generates noise that could substantially increase temporary ambient noise levels at sensitive residential receivers near construction sites. Atypical residential construction projects, such as those that may require the use of pile driving equipment, could result in higher noise levels than estimated herein. Therefore, forecasted residential development under the Housing Plan could result in potentially significant construction noise impacts and would require mitigation to minimize construction noise.

Mitigation Measures

The following mitigation measure is required to reduce construction-related noise impacts to sensitive receivers near future development sites.

N-1 Construction Noise Management Plan

Community Development Department shall develop a requirement for a Construction Noise Management Plan (CNMP) through amendments to the City's Municipal Code. The CNMP shall be implemented during construction within 85 feet of noise-sensitive land uses (e.g., residences, schools, churches, hotels, as well as some park and open space areas) for development and substantial redevelopment projects that have one or more of the following characteristics:

- Construction of one or more new subterranean levels;
- Construction of three or more new housing units (excluding ADUs);
- More than 3,000 cubic yards of excavated soils and grading;
- The potential for pile driving.

CNMPs shall include the following:

- Project-specific best management practices (BMPs) in addition to the construction timing limits currently established in Municipal Code Section 9.16.040. BMPs include, but are not limited to, silencers, enclosures, sound barriers, smart back-up alarms, strategic construction staging, and/or placement of restrictions on equipment or construction techniques. Projects that require pile driving shall be subject to the preparation of a construction noise analysis to determine appropriate BMPs.
- Identification of haul routes to reduce construction noise effects on sensitive receptors, ensure safety measures are in place, and minimize disruption to the surrounding roadway network. The identified haul route shall be utilized by all haul trucks throughout the duration of construction.
- Notification requirements including written notice to all property owners and residents within the project vicinity.
- Information and procedures for responding to noise complaints.

Significance After Mitigation

Implementation of Mitigation Measure N-1 would reduce construction noise impacts on sensitive receivers related to residential development by requiring implementation of Construction Noise Management Plans for projects which have the potential to disturb sensitive receivers. Implementation of Mitigation Measure N-1 would reduce noise impacts from construction activities to a less than significant level.

Threshold 2:	Would the project result in generation of a substantial permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Impact N-2 RESIDENTIAL DEVELOPMENT FORECASTED UNDER THE HOUSING PLAN WOULD GENERATE OPERATIONAL NOISE TYPICAL OF THE URBAN ENVIRONMENT. HOWEVER, LONG-TERM OPERATIONAL NOISE FROM RESIDENTIAL SOURCES WOULD BE REQUIRED TO COMPLY WITH THE CITY'S NOISE ORDINANCE. THEREFORE, PERMANENT OPERATIONAL NOISE INCREASES WOULD BE LESS THAN SIGNIFICANT.

Permanent operational noise factors include on-site activities as well as long-term noise from new vehicle trips on area roadways.

On-site Noise

Typical on-site noise sources associated with residential uses include HVAC equipment, delivery trucks, trash-hauling trucks, and outdoor activities.

HVAC Equipment

Noise levels from HVAC equipment associated with new residential development would be similar to noise from existing HVAC equipment associated with the current urban environment of Santa Barbara. Noise from stationary equipment including HVAC equipment is subject to the limits established in Municipal Code Section 9.16.020, which states that no person shall make, continue or cause to be made or continued, or permit or allow to be made or continued, any noise disturbance in such a manner as to be plainly audible by a person of ordinary sensitivity at 50 feet from the noise source. Additionally, Municipal Code Section 9.16.070.D limits sound at the property line resulting from mechanical equipment such as heating, ventilation, and air conditioning systems to 53 dB(A). Therefore, the Housing Plan would not result in a substantial permanent increase in ambient noise levels from HVAC equipment.

Vehicle Activity (Delivery and Trash-Hauling Trucks)

New residential development would increase the number and frequency of delivery trucks traveling through the City. The number of trash-hauling trucks contracted for solid waste pick-up would be expected to remain similar to current conditions, although with additional waste pick-up stops. Delivery trucks include, but are not limited to, moving trucks (e.g., U-Haul vehicles) and delivery service vehicles (e.g., Amazon, FedEx). An increase in the number of delivery trucks and trash hauling truck waste pick-up stops could intermittently expose various sensitive receivers to increased truck noise. However, Section 23130 of the California Motor Vehicle Code establishes maximum sound levels of 86 dBA L_{eq} at 50 feet for trucks operating at speeds less than 35 miles per hour. While individual delivery truck and/or loading or trash pick-up operations would likely be audible at properties adjacent to individual residential land uses, such operations are already a common occurrence in the urban environment in Santa Barbara. In addition, these noise events are typically transient and intermittent, and do not occur for a sustained period of time. In addition, solid waste pick-up operations are typically scheduled during daytime hours. Therefore, the new residential development that may be facilitated by the Housing Plan would not result in a substantial permanent increase in ambient noise levels from trash and delivery trucks due to State regulations and their prevalence in the City.

Outdoor Activities

New residential development would result in noise from conversations, music, television, or other outdoor sound-generating equipment (e.g., electric leaf blowers), particularly in the event future residents leave windows open or use balconies. However, these types of noise-generating activities would be similar to the existing urban environment in Santa Barbara and are regulated by existing Municipal Code requirements. Municipal Code Section 9.16.020.A. prohibits the operation of any radio, television set, instrument, loudspeaker, or other sound-generating devices between the hours of 10:00 p.m. and 7:00 a.m. in such a manner that creates a noise disturbance across a residential property line. Municipal Code Section 9.16.050 prohibits the operation of a leaf blower within 250 feet of any residential zone before 9:00 a.m. or after 5:00 p.m. Monday through Saturday, or at any time on Sundays or national holidays. Municipal Code Section 9.16.060 prohibits the use of leaf blowers powered with a gasoline engine. Required compliance with and code enforcement of these standards would ensure normal operational noise impacts associated with residential land uses would remain less than significant.

Traffic Noise

For the purposes of analyzing traffic noise from new residential development forecasted under the Housing Plan, a trip generation rate of 5.44 ADT per unit is used as a reasonable conservative estimate of the maximum daily trip generation from new housing units[1]. The trip generation scenarios used for this analysis are shown in Table 4.7-5, which assumes that the increase in traffic associated with residential development would be distributed evenly throughout the City's roadway network.

Table 4.7-5 Trip Generation Summary

	Total Housing Units	Estimated Trips Generated for Roadway Noise Analysis[1]
Existing Conditions	39,932	217,230
Future with Housing Plan (2035)	47,933	260,755
Total Change	**+8,001**	**+43,525**
Total Percent Change (%)	**+16.7%**	**+16.7%**

[1] Calculated by multiplying the total number of housing units by a trip generation rate of 5.44 ADT per unit for the purposes of analyzing roadway noise only. The 5.44 ADT rate reflects the trip generation rate associated with new housing units identified within the Institute of Transportation Engineers' Trip Generation Manual, Tenth Edition.

Source: City of Santa Barbara 2023

As shown in Table 4.7-5, the traffic noise analysis assumes a trip generation increase of 16.7 percent over existing conditions by the year 2035 under the Housing Plan, as a conservative estimate of the maximum daily trip generation from new housing units. A 16.7 percent increase in traffic on a roadway would equate to an increase of 0.8 dBA in ambient roadway noise levels. Ambient noise level increases of 3 dBA are considered a barely perceptible noise increase. Therefore, the project would not result in a perceptible increase in roadway noise levels. Although a concentrated increase in traffic may occur in the vicinity of new housing development, an increase in traffic-related noise is not anticipated based on the already high traffic volumes of major commercial corridors. Therefore, traffic noise impacts would be less than significant.

Mitigation Measures

No mitigation measures are required because this impact would be less than significant.

[1] ADT per unit is the metric used for noise analysis rather than vehicle miles traveled per capita because vehicle miles traveled does not clearly delineate individual vehicle trips, which are more representative of an increase of traffic than a change in vehicle miles traveled per capita.

Threshold 3:	Would the project generate excessive groundborne vibration or groundborne noise levels?

Impact N-3 CONSTRUCTION OF RESIDENTIAL DEVELOPMENT FORECASTED UNDER THE HOUSING PLAN COULD GENERATE VIBRATION LEVELS THAT HAVE THE POTENTIAL TO DAMAGE HISTORIC OR OTHER OLD BUILDINGS/STRUCTURES. HOWEVER, MITIGATION MEASURE N-2 WOULD REQUIRE PLANNED CONSTRUCTION ACTIVITIES TO PREPARE A VIBRATION CONTROL PLAN TO REDUCE/CONTROL CONSTRUCTION SUCH THAT VIBRATION LEVELS DO NOT CAUSE DAMAGE. THIS IMPACT WOULD BE LESS THAN SIGNIFICANT WITH MITIGATION.

The Housing Plan has the potential to result in new sources of groundborne vibration that have the potential to damage older structures.

Operational groundborne vibration from new residential development in Santa Barbara would be primarily generated by vehicular travel on the local roadways. According to the FTA *Transit Noise and Vibration Impact Assessment* (2018) guidance document, rubber tires and suspension systems dampen vibration levels from trucks to a level that is rarely perceptible. Therefore, traffic vibration levels associated with the expected additional vehicle trips from new residential development forecasted under the Housing Plan would not be perceptible by sensitive receivers. Therefore, the remainder of this analysis focuses on impacts related to construction activities associated with the project.

Construction activities associated with new residential development would result in varying degrees of groundborne vibration depending on the equipment and methods employed. Operation of construction equipment causes vibrations that spread through the ground and diminishes in strength with distance. Buildings with foundations in the soil in the vicinity of a construction site respond to these vibrations with varying results ranging from no perceptible effects at the lowest levels, low rumbling sounds and perceptible vibrations at moderate levels, and slight damage at the highest levels. Construction vibration is a localized event and is typically only perceptible to a receiver that is near the vibration source. Construction on sites with certain geologic conditions may require pile driving. Such heavy equipment could potentially operate within 25 feet of nearby buildings. As shown in Table 4.7-6, construction equipment would typically generate vibration levels up to 0.21 in/sec PPV (i.e., vibratory roller) at 25 feet, although pile driving could generate a vibration level of approximately 0.64 in/sec PPV at 25 feet.

Table 4.7-6 Construction Equipment Noise Levels in PPV (in/sec)

Equipment	25 Feet	50 Feet	75 Feet	100 Feet	125 Feet
Pile Driver (Impact)	**0.644**[1,2,3]	**0.300**[1,2]	0.192	0.140	0.110
Pile Driver (Sonic)	0.170	0.079	0.051	0.037	0.029
Vibratory Roller	0.210	0.098	0.063	0.046	0.036
Hoe Ram	0.089	0.042	0.027	0.019	0.015
Large Bulldozer	0.089	0.042	0.027	0.019	0.015
Caisson Drilling	0.089	0.042	0.027	0.019	0.015
Loaded Truck	0.076	0.036	0.023	0.017	0.013
Jackhammer	0.035	0.016	0.011	0.008	0.006

Equipment	25 Feet	50 Feet	75 Feet	100 Feet	125 Feet
Small Bulldozer	0.003	0.001	<0.001	<0.001	<0.001

Notes: Vibration levels shown in bolded and underlined text exceed one or more of the Caltrans criteria shown in Table 4.7-1. Superscripts specify the threshold exceeded by each piece of equipment. See Appendix E for vibration calculations.

[1] Exceeds the 0.25 in/sec damage threshold for historic and other/similar old buildings

[2] Exceeds the 0.3 in/sec damage threshold for older residential structures

[3] Exceeds the 0.5 in/sec damage threshold for modern industrial/commercial/residential structures

Sources: FTA 2018; Caltrans 2020

According to impact criteria shown in Table 4.7-1, the damage threshold for historic structures sensitive to impacts from groundborne vibration is 0.25 in/sec PPV. Groundborne vibration from rollers, hoe rams, bulldozers, caisson drilling, loaded trucks, and jackhammers would not exceed the 0.25 in/sec PPV threshold for sensitive historic buildings; therefore, typical construction activities would not exceed the damage threshold for historic and similar old buildings. However, vibration levels from impact pile driving would exceed the thresholds shown in Table 4.7-1 for historic/similar old buildings, general old residential structures, and modern structures when occurring within 60 feet of historic and similar old buildings.

As discussed in Section 4.4, *Cultural and Tribal Cultural Resources*, the City has designated several structures as City Landmarks and Structures of Merit. Although all buildings would be subject to potential impacts from construction vibration, buildings in these historic districts and groupings would each have varying degrees of susceptibility to groundborne vibration damage depending on the structural integrity of said buildings. Currently no requirement exists for the City to review the potential for a ministerial development to result in vibration damage associated with construction. As such, ministerial development projects have greater potential to result in building damage to historic and similar old buildings than discretionary development projects because no vibration-specific analyses are required to be performed prior to ground-disturbing activities. Therefore, the Housing Plan would result in a potentially significant impact related to construction vibration using impact pile driving.

Mitigation Measure

The following mitigation measure is required to reduce groundborne vibration impacts associated with construction of future development sites using impact pile driving.

N-2 Vibration Control Plan

Community Development Department shall develop a requirement for a Vibration Control Plan through amendments to the City's Municipal Code, which requires projects involving impact pile drivers within 60 feet of a structure to prepare a Vibration Control Plan. The Vibration Control Plan shall be prepared by a licensed structural engineer and shall include methods required to minimize vibration, including, but not limited to:

- Survey of baseline conditions at potentially affected historic and/or residential structures within a 60-foot radius of the construction site;
- Alternative installation methods for pile driving (e.g., pile cushioning, drilled piles, cast-in-place systems) within 60 feet of a building to reduce impacts associated with seating the pile;
- Vibration monitoring prior to and during pile driving operations occurring within 60 feet of a building;

- Use of rubber-tired equipment rather than metal-tracked equipment;
- Avoidance of the use of vibrating equipment when allowed by best engineering practices.

Significance After Mitigation

Mitigation Measure N-2 would require vibration monitoring and other controls during construction to reduce vibration levels below the vibration criteria for building damage. Therefore, the vibration impacts from construction activities related to the Housing Plan would be less than significant with mitigation.

Threshold 4:	Would the project site a land use in an area with noise levels exceeding City General Plan noise policies and land use compatibility guidelines?

Impact N-4 RESIDENTIAL DEVELOPMENT FORECASTED UNDER THE HOUSING PLAN COULD BE EXPOSED TO OUTDOOR NOISE LEVELS ABOVE THE CITY'S LAND USE COMPATIBILITY STANDARDS IN ADDITION TO THE 45 DBA LDN INTERIOR NOISE STANDARD. HOWEVER, EXISTING CITY GENERAL PLAN POLICIES, IN COMBINATION WITH THE CITY'S PROJECT REVIEW AND PERMITTING PROCESS, WOULD REDUCE POTENTIAL IMPACTS OF FUTURE NOISE ON NEW HOUSING DEVELOPMENT. THIS IMPACT WOULD BE LESS THAN SIGNIFICANT WITH MITIGATION.

As discussed in Section 4.7.1, *Environmental Setting*, the noise environment in Santa Barbara is characterized by transportation sources, predominantly traffic noise. Traffic noise affects relatively large areas of the City along transportation corridors, particularly neighborhoods near U.S. 101. The extent to which land uses in Santa Barbara are affected by transportation noise depends on their respective proximity to major roadways and UPRR and their individual sensitivity to noise (City of Santa Barbara 2010). Figure 4.7-2 depicts modeled 60-65, 65-70, and 70+ dBA Ldn noise contours representative of existing conditions and the extent of noise exposure in the City above 60 dBA Ldn. As discussed in Impact N-2, housing development forecasted under the Housing Plan would generate additional vehicle trips, increasing off-site traffic on area roadways by approximately 16.7 percent, but this increase would not substantially exacerbate existing traffic noise conditions in the City.

Environmental Resources Element Policy ER31 establishes the City's land use compatibility standard for residential uses as 65 dBA Ldn (City of Santa Barbara 2011). Compared to existing ambient noise in the City, new housing development located near major roadways (e.g., Upper State Street, Las Positas Road, Cabrillo Boulevard) or U.S. 101 could be exposed to outdoor noise levels above 65 dBA Ldn. This impact is considered potentially significant.

The City's Environmental Resources Element also identifies 45 dBA Ldn as the acceptable interior noise level for residential uses, consistent with the 2022 California Building Standards Code (City of Santa Barbara 2011). The Housing Plan would implement programs, such as the Affordable Housing Strategy, which could result in increased residential land use densities. In addition, the Housing Plan would result in increased residential uses along established commercial corridors, including those with late-night businesses such as restaurants and bars. The Housing Plan would also result in mixed-use developments with commercial activity which could increase noise. However, all development in Santa Barbara is subject to the City's existing standards within Santa Barbara Municipal Code (SBMC) Chapter 9.16, and new residential development forecasted under the Housing Plan would be required to adhere to standards for noise included under SBMC Chapter 9.16. Although the Housing Plan may increase residential density in certain areas, the Housing Plan would not result in substantial noise in exceedance of the City's land use compatibility standards through compliance with existing land use compatibility requirements.

Implementation of Mitigation Measure N-3 would reduce the potential impacts of projected future noise on new housing development to a less than significant level with mitigation.

Mitigation Measures

N-3 Noise Study and Site-based Attenuation

The City of Santa Barbara Community Development Department shall update the Master Environmental Assessment Guidelines for Noise and amend the City's Municipal Code as necessary, with requirements applicable to multi-unit residential development projects within an area with a noise contour potentially exceeding the acceptable noise level for residential uses.

A site-specific noise study shall be completed for residential development located in areas where noise contours indicate that noise levels are above 65 dBA. The noise study shall document the existing noise conditions onsite and recommend attenuation strategies and techniques to reduce interior and exterior living area noise levels to acceptable levels as specified in the Environmental Resources Element Land Use Compatibility Guidelines.

- An onsite noise study shall be performed by an acoustical engineer.
- The noise study shall measure and report the existing ambient Average Day-Night (Ldn or CNEL) noise environment within the project site, including transportation noise sources and any transient or nuisance noise sources.

All noise control techniques and recommendations in the report shall be incorporated into the project design to reduce exterior noise to at or below 65 dBA and interior noise to at or below 45 dBA.

Significance After Mitigation

Mitigation Measure N-3 would require a site-specific noise study for residential development located in areas where noise contours indicate that noise levels are above 65 dBA. Site-specific attenuation strategies and techniques would be implemented to reduce exterior noise to below 65 dBA and interior noise to below 45 dBA. Therefore, impacts related to noise and land use compatibility would be less than significant with mitigation.

Threshold 5:	For a project located within the vicinity of a private airstrip or SBCAG Airport Land Use Plan/Airport Influence Area, would the project expose people residing or working in the project area to excessive noise levels?

Impact N-5 RESIDENTIAL DEVELOPMENT UNDER THE HOUSING PLAN WOULD NOT OCCUR WITHIN AN AIRPORT NOISE CONTOUR. THIS IMPACT WOULD BE LESS THAN SIGNIFICANT.

The Santa Barbara Airport's 65 dBA CNEL noise contour extends approximately 3,000 feet to the east of the airport; however, the Housing Plan does not propose new residential uses within this noise contour. Therefore, any development that would occur immediately surrounding the Santa Barbara Airport is outside of the scope of the Housing Plan, and no residential development would be located within the Airport's 65 CNEL noise contour. Although the aircraft overflights have the potential to expose people residing or working in the City to aircraft noise, this intermittent and temporary noise disturbance is present under existing conditions, and implementation of the Housing Plan would not exacerbate or increase aviation-related noise levels. Impacts would be less than significant.

Mitigation Measures

No mitigation measures are required because this impact would be less than significant.

4.7.4 Cumulative Impacts

Regional cumulative impacts consider City-wide impacts together with similar impacts of reasonably anticipated regional projects/programs including the City's State Street Master Plan, and Caltrans' South Coast Highway 101 High-Occupancy Vehicle Lanes project. Cumulative impacts also include planned and pending residential development projects that contribute to the City's RNHA. The general approach to cumulative impact analysis used in this EIR is discussed in Section 4, *Environmental Impact Analysis*.

Construction Noise

Cumulative residential development in the city would produce temporary noise impacts that would be localized to a project site and sensitive receivers in the immediate vicinity. Therefore, only sensitive receivers located near each construction site would be potentially affected by each activity. Construction activities associated with all future development would comply with Municipal Code Section 9.16.040 and would not occur during nighttime hours between 8:00 p.m. of any day and 7:00 a.m. of the following day unless a special permit has been applied for and granted by the Chief Building Official. Nonetheless, cumulative construction activities may overlap, including the use of heavy machinery which could result in substantial increases in temporary ambient noise levels. Therefore, cumulative impacts related to construction noise are potentially significant. Implementation of Mitigation Measure N-1 would reduce construction noise impacts associated with residential projects on sensitive receivers through implementation of Construction Noise Management Plans. With implementation of Mitigation Measure N-1, the Housing Plan would minimize disturbance of sensitive receptors due to construction noise and therefore would not contribute considerably to cumulative impacts related to construction noise.

Operational Noise

On-site operational noise impacts are typically localized to individual project sites and sensitive receivers within the immediate vicinity. Such activities would be typical of the urban environment in the City and on-site activities would be required to comply with applicable provisions of the Municipal Code. The incremental effect of the Housing Plan with respect to on-site operational noise would not be cumulatively considerable and cumulative impacts would be less than significant.

Cumulative development through the year 2035, including the Caltrans' South Coast Highway 101 High-Occupancy Vehicle Lanes project, would increase traffic on area roadways which would lead to increased cumulative traffic noise. As shown in Table 4.7-5, future trip generation levels by the year 2035 with housing development forecasted under the Housing Plan, which accounts for cumulative residential development in and around the City, would not double existing trip levels or increase mobile source noise by more than 3 dBA. Therefore, the effect of the Housing Plan on off-site traffic noise would not be cumulatively considerable and cumulative impacts would be less than significant.

Groundborne Vibration

New residential development within the City would not include substantial sources of operational ground-borne vibration. Therefore, cumulative impacts related to operational ground-borne noise and vibration at any sensitive receiver would not be significant.

Construction of future residential development projects in the City would produce temporary vibration impacts that would be localized to a project site and sensitive receivers in the immediate vicinity. Therefore, only sensitive receivers located near each construction site would be potentially affected by each individual activity. Nonetheless, construction activities associated with individual housing projects accommodated under the Housing Plan may overlap for some time with construction activities for other development projects. For the combined vibration impact from simultaneous construction projects to reach cumulatively significant levels, intense construction from these projects would have to occur simultaneously near a sensitive receiver. This would most commonly occur when development projects using equipment that generates high vibration levels (e.g., pile driving) are proposed next to a sensitive historic building constructed of fragile building. However, Mitigation Measure N-2 would require vibration monitoring and other controls during construction to reduce vibration levels below the vibration criteria for building damage. Therefore, vibration impacts from construction activities related to the Housing Plan would not be cumulatively considerable and cumulative impacts would be less than significant.

Airport Noise

Existing requirements for airports and existing local, State, and Federal regulations would reduce the cumulative noise impacts of airport activity on residents and workers in the City. The residential land use designations and zoning immediately surrounding the Santa Barbara Airport are outside of the City's jurisdiction. Therefore, cumulative residential development would not occur within the Airport's 65 CNEL noise contour. Although aircraft overflights have the potential to expose people residing or working in the City to aircraft noise, this intermittent and temporary noise disturbance is present under existing conditions. Therefore, the impact from aviation-related excessive noise exposure would not be cumulatively considerable and cumulative impacts would be less than significant.

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