4.13 NOISE

	Would the Project Result In:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a)	Generation of substantial temporary or permanent increase in ambient noise levels in the vicinity if the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐
b)	Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c)	For a project within the vicinity of a private airstrip or airport land use plan, or where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people be residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

4.13.1 Environmental Setting

Noise Fundamentals and Terminology

Noise is generally defined as unwanted sound that annoys or disturbs people and potentially causes an adverse psychological or physiological effect on human health. Because noise is an environmental pollutant that can interfere with human activities, evaluation of noise is necessary when considering the environmental impacts of the proposed project.

Sound is mechanical energy (vibration) transmitted by pressure waves over a medium such as air or water. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level is the most common descriptor used to characterize the loudness of an ambient (existing) sound level. Although the decibel (dB) scale, a logarithmic scale, is used to quantify sound intensity, it does not accurately describe how sound intensity is perceived by human hearing. The perceived loudness of sound is dependent upon many factors, including sound pressure level and frequency content. The human ear is not equally sensitive to all frequencies in the entire spectrum, so noise measurements are weighted more heavily for frequencies to which humans are sensitive in a process called A-weighting, written as dBA and referred to as A-weighted decibels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and community response to noise.

With respect to how humans perceive and react to changes in noise levels, a 1 dBA increase is imperceptible, a 3 dBA increase is barely perceptible, a 5 dBA increase is clearly noticeable, and a 10 dBA increase is subjectively perceived as approximately twice as loud (Egan 2007). These subjective reactions to changes in noise levels were developed on the basis of test subjects' reactions to changes in the levels of steady-state pure tones or broadband noise and to changes in levels of a given noise source. These statistical indicators are thought to be most applicable to noise levels in the range of 50 to 70 dBA, as this is the usual range of voice and interior noise levels. Numbers of agencies and municipalities have developed or adopted noise level standards consistent with these and other similar studies to help prevent annoyance and to protect against the degradation of the existing noise environment.

Different types of measurements are used to characterize the time-varying nature of sound. These measurements include the equivalent sound level (L_{eq}), the minimum and maximum sound levels (L_{min} and L_{max}, respectively), percentile-exceeded sound levels (such as L_{10}, L_{20}), the day-night sound level (L_{dn}), and the community noise equivalent level (CNEL). L_{dn} and CNEL values differ by less than 1 dB. As a matter of practice, L_{dn} and CNEL values are considered to be equivalent and are treated as such in this assessment.

For a point source such as a stationary compressor or construction equipment, sound attenuates based on geometry at a rate of 6 dB per doubling of distance. For a line source such as free-flowing traffic on a freeway, sound attenuates at a rate of 3 dB per doubling of distance (Federal Highway Administration 2011a). Atmospheric conditions, including wind, temperature gradients, and humidity, can change how sound propagates over distance and can affect the level of sound received at a given location. The degree to which the ground surface absorbs acoustical energy also affects sound propagation. Sound that travels over an acoustically absorptive surface, such as grass, attenuates at a greater rate than sound that travels over a hard surface, such as pavement. The increased attenuation is typically in the range of 1 to 2 dB per doubling of distance. Barriers, such as buildings and topography that block the line of sight between a source and receiver, also increase the attenuation of sound over distance (Federal Highway Administration 2011b).

Because decibels are logarithmic units, sound pressure levels cannot be added or subtracted through ordinary arithmetic. On the dB scale, a doubling of sound energy corresponds to a 3 dB increase. In other words, when two identical sources are each producing sound of the same loudness, their combined sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one source produces a sound pressure level of 70 dBA, two identical sources would combine to produce 73 dBA. The cumulative sound level of any number of sources can be determined using decibel addition.

Vibration Standards

Vibration is like noise such that noise involves a source, a transmission path, and a receiver. While related to noise, vibration differs in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and a frequency. A person's perception to the vibration would depend on his or her individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system that is vibrating.

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities in inches per second (in/sec). Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of peak particle velocities. The City does not have specific policies pertaining to vibration levels. However, vibration levels associated with construction activities and proposed project operations are addressed as potential noise impacts associated with the proposed project implementation.

Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. In Table 4.13-1, the general threshold at which human annoyance could occur is noted as 0.1 in/sec peak particle velocity (PPV). Table 4.13-2 indicates that the threshold for damage to structures ranges from a PPV of 0.2 to 0.6 in/sec.

Table 4.13-1: Guideline Vibration Annoyance Potential Criteria

Human Response	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Sources
Barely Perceptible	0.04	0.01
Distinctly Perceptible	0.25	0.04
Strongly Perceptible	0.90	0.10
Severe	2.00	0.40

Notes: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

in/sec = inches per second

PPV = peak particle velocity

Source: Caltrans 2013.

Table 4.13-2: Guideline Vibration Damage Potential Criteria

Structure and Condition	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.20	0.10
Historic and some 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:

in/sec = inches per second

PPV = peak particle velocity

Source: Caltrans 2013, Caltrans 2004

Operation of heavy construction equipment, particularly pile driving and other impact devices such as pavement breakers, create seismic waves that radiate along the surface of the earth and downward into the earth. These surface waves can be felt as ground vibration. Vibration from operation of this equipment can result in effects ranging from annoyance of people to damage of structures. Varying geology and distance will result in different vibration levels containing different frequencies and displacements. In all cases, vibration amplitudes will decrease with increasing distance.

Perceptible groundborne vibration is generally limited to areas within a few hundred feet of construction activities. As seismic waves travel outward from a vibration source, they excite the particles of rock and soil through which they pass and cause them to oscillate. The actual distance that these particles move is usually only a few ten-thousandths to a few thousandths of an inch. The rate or velocity (in in/sec) at which these particles move is the commonly accepted descriptor of the vibration amplitude, referred to as the PPV.

Table 4.13-3 summarizes typical vibration source levels generated by various construction equipment.

Table 4.13-3: Vibration Source Levels for Construction Equipment

Equipment	PPV at 25 Feet
Vibratory roller	0.210
Large bulldozer	0.089
Loaded trucks	0.076
Small bulldozer	0.003

Note:
PPV = peak particle velocity
Source: FTA 2018

Vibration amplitude attenuates over distance and is a complex function of how energy is imparted into the ground and the soil conditions through which the vibration is traveling. The following equation can be used to estimate the vibration level at a given distance for typical soil conditions (FTA 2018). PPVref is the reference PPV from Table 4.13-3:

PPV = PPVref x (25/Distance)^1.5

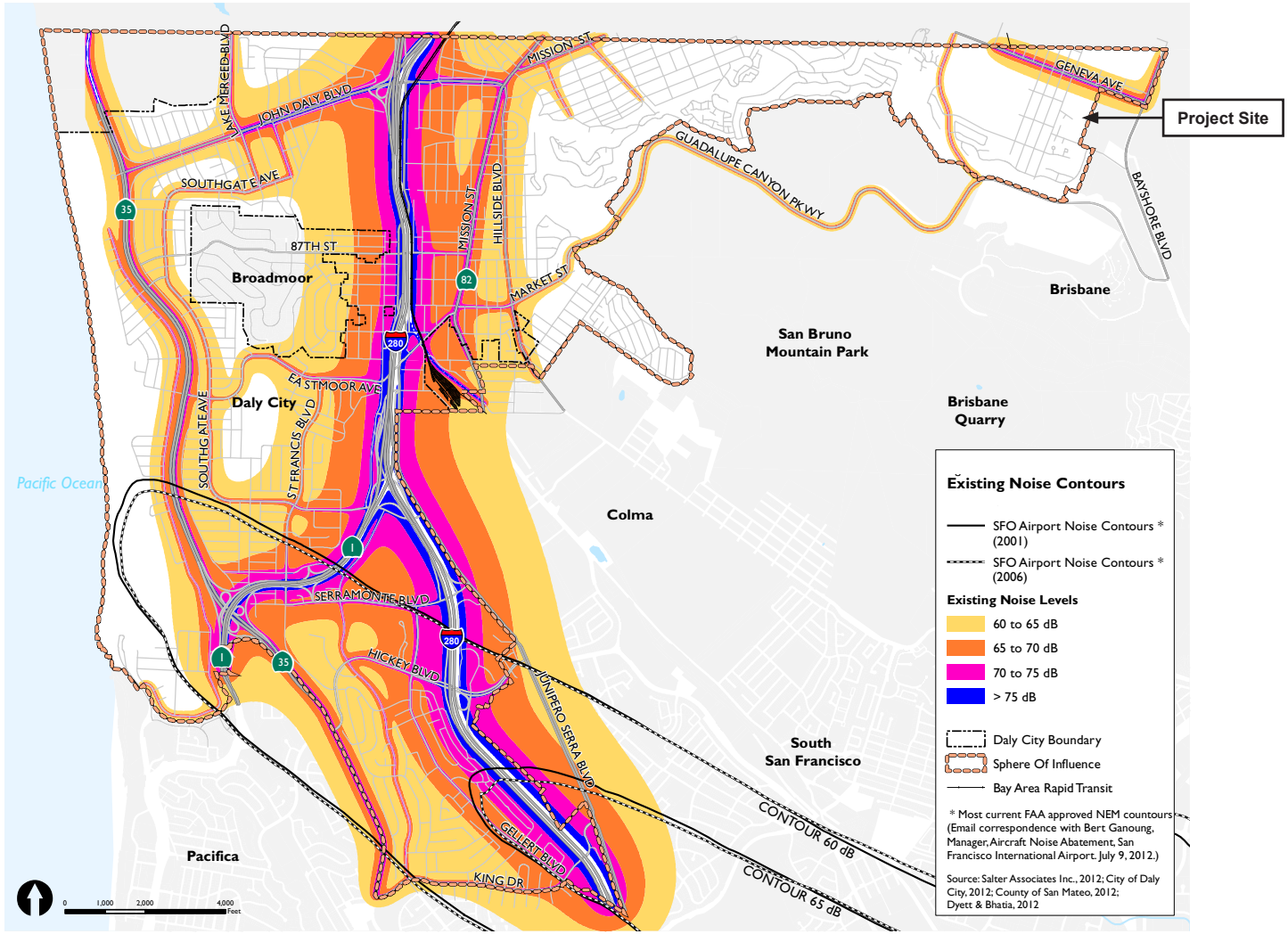
4.13.2 Previous Environmental Analysis

City of Daly City General Plan EIR Summary

Chapter 3.10 of the General Plan EIR discusses potential impacts related to construction noise, traffic noise, airport noise, and groundborne vibration. The General Plan EIR determined certain locations in the City would experience traffic noise increases by more than 3 dB. While it is possible to minimize potential noise impacts with implementation of noise-attenuating features, the City cannot guarantee that these measures would take place. Therefore, the General Plan EIR determined that impacts related to traffic noise would result in a significant and unavoidable impact. The General Plan EIR determined that impacts related to construction noise, airport noise, and groundborne vibration would be less than significant as future projects would be required to comply with City's noise standards included in Chapter 9.22 of the Municipal Code.

The following General Plan policies apply to the proposed project:

Policy NE-1: Use the future noise contour map to identify existing and potential noise impact areas (See Figure 4.13-1).



Stantec

Figure No.
4.13-1

Title
Existing Noise Contours

Client/Project
City of Daly City
Midway Village Redevelopment Project

Project Location
Daly City, CA

185704589

Source: Daly City General Plan EIR
Date: 2013

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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.

Policy NE-3: Maintain a CNEL level of not more than 70 dBA L_{eq} in residential areas.

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.

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. "Conditionally Acceptable" noise environments are defined by the Daly City Noise and Land Use Compatibility Matrix as shown in Figure 4.13-2. 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.

Plan Bay Area EIR Summary

The following summarizes the potential noise impacts discussed in Chapter 2.6 of the Plan Bay Area EIR and includes the complete text of mitigation measures previously identified by the Plan Bay Area EIR that are applicable to the proposed project.

Impact 2.6-1: Construction Noise Levels and Groundborne Vibration. The Plan Bay Area EIR determined that future development projects have the potential to result in substantial construction noise and vibration levels such that nearby sensitive receptors could be adversely affected, and noise standards exceeded. However, impacts would be less than significant with implementation of Mitigation Measure 2.6-1(a) (Refer to Impact NOI-1 in Section 4.13-3, Project-Specific Analysis).

> ***PBA EIR MM 2.6-1(a):*** *To reduce construction noise levels, implementing agencies and/or project sponsors shall:*
>
> - *comply with local construction-related noise standards, including restricting construction activities to permitted hours as defined under local jurisdiction regulations (e.g.; Alameda County Code restricts construction noise to between 7:00 AM and 7:00 PM on weekdays and between 8:00 AM and 5:00 PM on weekends);*
> - *properly maintain construction equipment and outfit construction equipment with the best available noise suppression devices (e.g., mufflers, silencers, wraps);*
> - *prohibit idling of construction equipment for extended periods of time in the vicinity of sensitive receptors;*
> - *locate stationary equipment such as generators, compressors, rock crushers, and cement mixers a minimum of 50 feet from sensitive receptors, but further if possible;*

- *erect temporary construction-noise barriers around the construction site when adjacent occupied sensitive land uses are present within 75 feet;*
- *use noise control blankets on building structures as buildings are erected to reduce noise emission from the site; and*
- *use cushion blocks to dampen impact noise from pile driving.*

Impact 2.6-2: Increased Noise from Traffic and Transit. The Plan Bay Area EIR determined that some areas would result in regional average noise increases and localized traffic-related noise levels that exceed applicable thresholds and would result in a substantial permanent increase in noise. The Plan Bay Area EIR determined that traffic noise impacts would be less than significant with implementation of Mitigation Measure 2.6-2. Mitigation Measure 2.6-2 is not applicable to the proposed project because the proposed project is not located within the 70 dBA CNEL noise contour of a freeway.

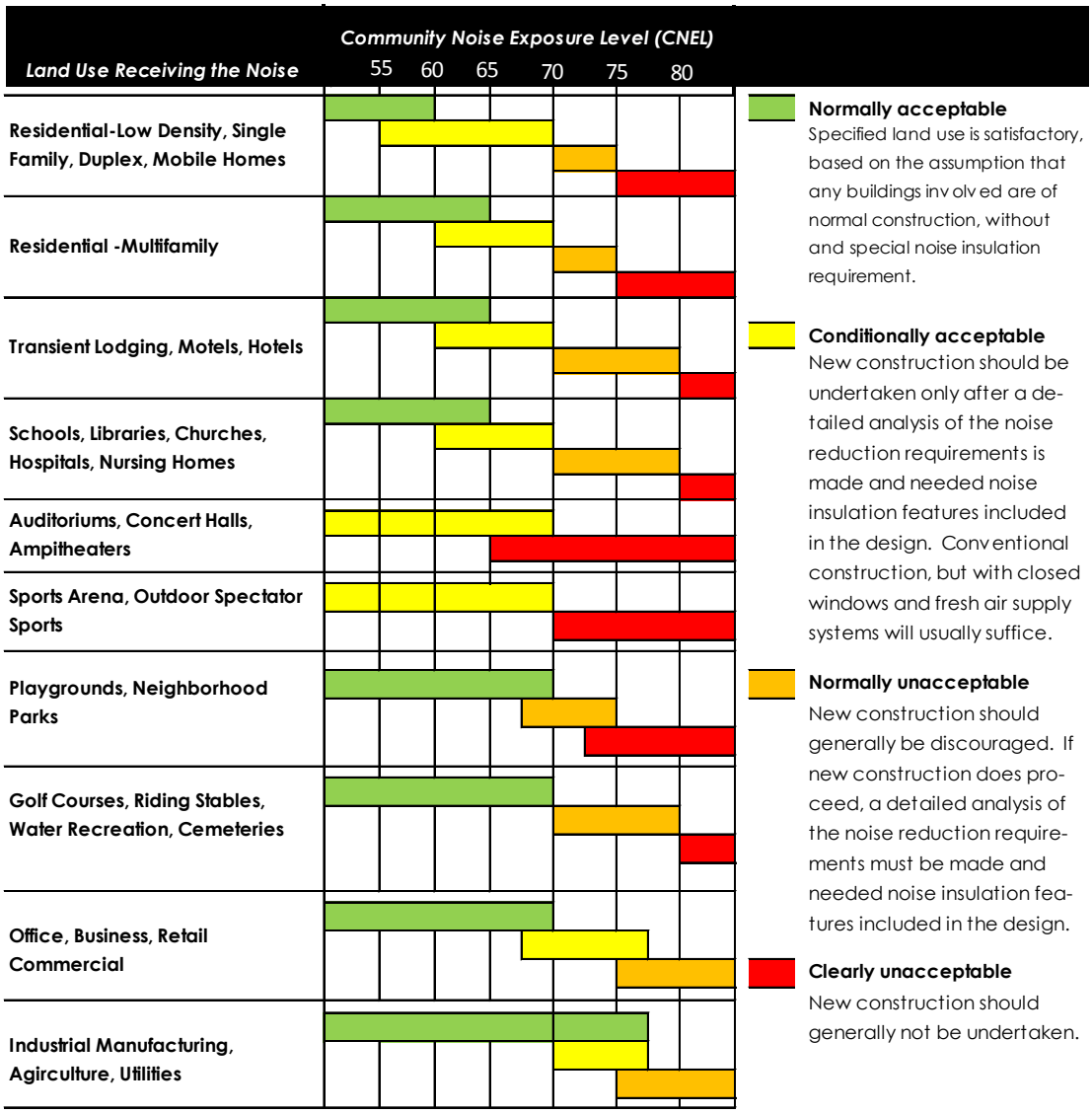
Impact 2.6-3 and Impact 2.6-4: Rail Transit Noise and Vibration. The Plan Bay Area EIR determined that future rail transit projects would result in new noise and vibration sources that could affect existing sensitive land uses. However, impacts would be less than significant with implementation of Mitigation Measures 2.6-3(a), 2.6-3(b), 2.6-3(c), 2.6-4(a), 2.6-4(b), and 2.6-4(c). The proposed project does not involve the construction of a rail transit line, and therefore these mitigation measures are not applicable.

Impact 2.6-5: Ambient Noise. The Plan Bay Area EIR determined that future development projects could expose existing or new sensitive receptors to noise levels that exceed land use compatibility thresholds, resulting in a substantial permanent increase in noise. However, this impact would be reduced to a less than significant level with implementation of Mitigation Measure 2.6-5 (Refer to Impact NOI-1 in Section 4.13-3, Project-Specific Analysis).

PBA EIR MM 2.6-5: *To reduce exposure to new and existing sensitive receptors from non-transportation noise associated with projected development, implementing agencies and/or project sponsors shall implement measures, where feasible and necessary based on project- and site-specific considerations that include, but are not limited to:*

- *Local agencies approving land use projects shall require that routine testing and preventive maintenance of emergency electrical generators be conducted during the less sensitive daytime hours (per the applicable local municipal code). Electrical generators or other mechanical equipment shall be equipped with noise control (e.g., muffler) devices in accordance with manufacturers' specifications.*
- *Local agencies approving land use projects shall require that external mechanical equipment, including HVAC units, associated with buildings incorporate features designed to reduce noise to below 70 dBA CNEL or the local applicable noise standard. These features may include, but are not limited to, locating equipment within equipment rooms or enclosures that incorporate noise reduction features, such as acoustical louvers, and exhaust and intake silencers. Equipment enclosures shall be oriented so that major openings (i.e., intake louvers, exhaust) are directed away from nearby noise-sensitive receptors.*

Impact 2.6-6: Airport Noise Levels. The Plan Bay Area EIR analyzed the potential impacts related to increased noise exposure from aircraft or airports and determined with the implementation of Plan Bay Area Mitigation Measure 2.6-6 the impact would be less than significant. The proposed project is not located within an airport land use plan and therefore this mitigation measure is not applicable (Refer to Impact NOI-3 in Section 4.13-3, Project-Specific Analysis).



Stantec

Figure No.
4.13-2

Title
Daly City Noise Compatibility Guidelines

Client/Project
City of Daly City
Midway Village Redevelopment Project

Project Location
Daly City, CA

185704589

Source: Daly City General Plan EIR
Date: 2013

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4.13.3 Project-Specific Analysis

Project Location and Sensitive Receptors

Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are considered to be more sensitive to noise intrusion than are commercial or industrial activities. Ambient noise levels can also affect the perceived desirability or livability of a development.

The project site is located in the northeast region of the City at the intersection of Midway Drive, Schwerin Street, and Martin Street, near the border of the City and County of San Francisco. The project site is bordered by existing Midway Village single- and multi-family residences to the west and south; a PG&E facility, including administrative buildings, parking, industrial storage, and a power distribution area to the north and east; and a Toll Brothers site, which is currently graded and undeveloped, also to the south. The closest major roadway to the project site is Bayshore Boulevard, which is about 1,320 feet away. U.S. 101 is approximately 1.06 miles from the project site. The Cow Palace is about 980 feet from the west edge of the project site. The San Francisco International Airport is located approximately 5.4 miles from the project site.

The closet sensitive receptors to the project site are the existing multi-family and single-family residential buildings across Midway Drive, Schwerin Street, and Martin Street, with the closest receptors being about 64 feet from the project site.

Existing Ambient Noise Levels

The existing noise environment in a project area is characterized by the area's general level of development because the level of development and ambient noise levels tend to be closely correlated. Areas that are not urbanized are relatively quiet, while areas that are more urbanized are noisier as a result of roadway traffic, industrial activities, and other human activities.

The City is exposed to noise generated by traffic on I-280, Highway 1, and Highway 35 and to a lesser extent, along major arterial roads such as Geneva Avenue, Guadalupe Canyon Parkway, and Bayshore Boulevard. Traffic noise depends primarily on traffic speed (tire noise increases with speed) and the proportion of truck traffic (trucks generate engine, exhaust, and wind noise in addition to tire noise). Changes in traffic volumes can also have an impact on overall traffic noise levels. For example, it takes 25 percent more traffic volume to produce an increase of only 1 dBA in the ambient noise level. For roads already heavy with traffic volume, an increase in traffic numbers could even reduce noise because the heavier volumes could slow down the average speed of the vehicles. A doubling of traffic volume results in a 3 dBA increase in noise levels.

Existing roadway noise contours are depicted in Figure 4.13-1. The project site is not located in an existing noise contour zone (City of Daly City 2013). Geneva Avenue, a major arterial road, runs close to but not adjacent to the proposed project; however, the project site is buffered from traffic noise along Geneva Avenue by existing buildings. Therefore, ambient noise levels at the project site are expected to be below 60 dBA CNEL and should be in the "Normally Acceptable" category for both residential and commercial uses according to the General Plan Land Use Compatibility Matrix.

Impact NOI-1 Generation of 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?

Impact Analysis

Exterior Traffic Noise at Existing Sensitive Receptors

To describe future noise levels due to traffic added from the proposed project, AM and PM peak hour traffic counts (with and without the proposed project) listed in Figures 6 and 8 in the November 21, 2019 "45 Midway Drive Affordable Housing Transportation Impact Analysis" report were used to determine the percentage increase of traffic on the roads adjacent to the project site and adjacent sensitive receivers.

Table 4.13-4 shows the peak hour counts associated with traffic on the local roadway network under baseline and baseline plus proposed project traffic conditions. The last columns in the table show the overall percentage change and the estimated difference in peak hour noise level.

Table 4.13-4: Traffic Peak Hour Counts and Estimated Noise Increase

Roadway	Baseline Peak Hour Traffic Count	Peak Hour Traffic Count with Project	Percentage Change	Estimated dB Change
Martin Street at Schwerin Street	130 (149)	135 (149)	4% (0%)	0.2 (0)
Schwerin Street at Martin Street	190 (188)	195 (188)	3% (0%)	0.1 (0)
Main Street at Bayshore Blvd	93 (125)	135 (176)	45% (41%)	1.8 (1.6)
Bayshore Blvd at Main Street	1,621 (1,665)	1,663 (1,716)	3% (3%)	0.1 (0.1)
Geneva Ave at Schwerin Street	1,769 (1,928)	1,880 (2,037)	6% (6%)	0.2 (0.2)

Notes:
dB = Decibel
Numbers in parenthesis are PM peak hour traffic volumes.

The proposed project is expected to minimally increase traffic counts along Martin Street, Schwerin Street, Bayshore Blvd, and Geneva Avenue. There would be no noticeable change in traffic noise expected along these streets. Peak traffic counts are expected to increase approximately 41 to 45 percent along Main Street at Bayshore Boulevard. Traffic increases of 45 percent increase noise levels approximately 1.8 dB, which is barely perceptible to imperceptible and represents a minimum impact. For reference, an increase in 3 dB represents a doubling of loudness according to Federal Highway Administration Guidance, and the increase in noise levels by 1.8 dB would below this amount (Federal Highway Administration 2011a). Therefore, the proposed project would not cause increased traffic noise levels over the baseline conditions at the neighboring sensitive receivers and this would be a less than significant impact relative to this topic.

Interior Traffic Noise at New Sensitive Receptors – Residential

The CBC and the City states that the interior noise levels attributable to exterior sources shall not exceed 45 dBA in any habitable room, including residential units. The needed sound isolation requirements of a building's exterior façade system will be dependent on the following conditions:

- The dimension of the rooms with exterior windows;
- The finishes within the rooms;

- The ratio of clear glass to solid wall in the exterior wall assembly; and
- The exterior solid wall construction.

Modern construction with punch windows typically provides a 25 dBA exterior-to-interior noise level reduction with windows closed. Therefore, sensitive receptors exposed to exterior noise of 70 dBA L_{dn}/CNEL or less will typically comply with the code-required interior noise level standard. Modern construction using window walls, curtainwalls, or a high ratio of exterior clear glass would provide less reduction with the windows closed. Buildings using a high amount of glass would typically comply with the code-required interior noise level standard if exposed to exterior noise levels of 67 dBA L_{dn}/CNEL or less.

Based on the existing noise level contours (Figure 4.13-1) listed in the General Plan Noise Element, noise levels at the project site are expected to be below 60 dBA CNEL. With a maximum exterior noise level of 60 dBA CNEL, interior noise levels within the residential units would comply with code requirements with standard exterior façade constructions and would have a less than significant impact.

Interior Traffic Noise at New Sensitive Receptors – Commercial

CALGreen states if an occupied non-guestroom space is exposed to a noise level of 65 dBA L_{eq} 1-hour during any hour of operation, the exterior façade design shall incorporate features to reduce noise inside the spaces to a maximum of 50 dBA L_{eq} 1-hour. Given that the project site would be exposed to noise levels up to 60 dBA CNEL, a one-hour noise level of 65 dBA or greater is unlikely, and the building would not be subject to the CALGreen requirements. Therefore, standard construction should be acceptable for the commercial spaces to achieve the CALGreen code requirements, and traffic noise levels would have a less than significant impact.

Proposed Project Fixed-Source Noise

Typical multi-family residential/commercial building construction would commonly involve new rooftop mechanical equipment, such as air-handling units, condensing units, make-up air units, and exhaust fans. This equipment would generate noise that would radiate to neighboring properties, which could result in a potentially significant impact prior to mitigation. The noise from this equipment would be required to comply with Section 9.22 “Disturbing the Peace” of the Daly City Municipal Code, Section 1207.4 of the CBC, and Mitigation Measure NOI-1 (PBA EIR MM 2.6-5) at the neighboring residential receptors. Thus, Mitigation Measure NOI-1 (PBA EIR MM 2.6-5) and Mitigation Measure NOI-2 would be required to ensure that the onsite equipment would be designed incorporating measures such as shielding and/or appropriate attenuators to reduce noise levels that may affect nearby properties. With Mitigation Measure NOI-1 (PBA EIR MM 2.6-5) and Mitigation Measure NOI-2, the impact of fixed-source noise to the neighboring properties would be less than significant.

Proposed Project Operational Noise

As part of the proposed project, several outdoor recreational areas and a park would be introduced or relocated on the site. The recreational areas and park would provide opportunities to foster community and interaction with open space throughout the project area. The specific recreational areas would include the following:

- **The Garden:** Including a community garden and an exercise deck. Located internal to the site near Building E. Shielded from Schwerin and Martin streets.
- **The Family Room:** Including a multi-use lawn, a tot play area, and an outdoor dining area. Located internal to the site in the Building D courtyard. Shielded from Schwerin and Martin streets.

- **The Residents Park:** Including an outdoor dining area, a multi-use lawn, a plaza, terrace seating, and a play area. Located internal to the site near the community center. Shielded from Schwerin and Martin streets.
- **The Residents Garden:** Including a meditation garden and an outdoor dining area. Located internal to the site in the Building B courtyard. Shielded from Schwerin and Martin streets.
- **The Family Court:** Including a picnic area and a play area. Located internal to the site in the Building A2 courtyard. Shielded from Schwerin and Martin streets.
- **Bayshore Park:** Bayshore Park is an existing City park adjacent to the existing Midway Village area. This park would maintain its existing purpose; however, it would be relocated within the new Midway Village Redevelopment to the northern most portion of the project site, closer to Schwerin Street. The development of the park would be the responsibility of the City. Future improvements at the park may contain elements such as a soccer field, tennis court, a playground, a 10-foot wide jogging path with workout stations around the perimeter of the park, restrooms, and additional parking spaces.

The existing play area associated with the child-care facility would also be relocated to Building B2, which brings the play area closer to the residential receptors along Schwerin Street. The child-care area would be set back within the building such that Building B2 would provide shielding between the play area and Schwerin Street.

All activities taking place within the recreational areas, park, and the child-care play area would take place during daytime hours, and the final design and development of these areas would be subject to the noise level restrictions set in the Daly City Noise Compatibility Guidelines in the General Plan. Therefore, the impact of noise from the recreational areas, park, and child-care play area to the closet residential receptors would be less than significant.

Short-Term Construction Noise Impacts

Two types of short-term noise impacts could occur during construction of the proposed project. First, construction crew commutes and the transport of construction equipment and materials to the project site would incrementally increase noise levels on access roads leading to the project site. This increased traffic would be comprised of vehicles, medium trucks, and heavy trucks.

Workers would access the project site from the city streets and U.S. 101. Construction materials and equipment would be delivered using trucks during the daytime hours (7 AM and 9 PM). Construction workers required for each phase of the proposed project and would fluctuate between 15 and 75 workers per day with an average of 35 workers per day.

The associated short-term noise from construction vehicles along city streets, such as Schwerin Street would be perceptible, however, such a noise increase would be instantaneous and short term. The Federal Transit Administration (FTA) offers construction mitigation measures listed in Section 12.1.3 “Mitigation of Construction Noise” in the Transit Noise and Vibration Impact Assessment document (FTA 2006), which would be implemented through Mitigation Measure NOI-3. This document recommends rerouting truck traffic away from residential streets, if possible, and to select streets with fewest homes, if no alternatives are available. Mitigation Measure NOI-3 follows the FTA recommendations to limit noise to the closest noise-sensitive receivers. With Mitigation Measure NOI-3, the impact of construction traffic noise to the neighboring properties would be less than significant.

The second type of short-term noise impact is related to noise generated during construction. Construction activities would include excavation activities and grading, foundation work, building construction, and paving. Each construction stage has its own mix of equipment and consequently, its own noise characteristics. These various

construction operations would change the character of the noise generated at the project site and therefore, the ambient noise level as construction progresses. The loudest phases of construction typically include excavation, building construction, and grading phases as the noisiest construction equipment is earthmoving and grading equipment. Table 4.13-5 lists types of construction equipment that may be used throughout construction and the maximum and average operational noise level as measured at 64 feet from the operating equipment. The 64-foot distance represents the approximate distance between the project site and the closest residential receptors across Martin Street. Appendix H shows the noise calculations and inputs that were used from the Roadway Construction Noise Model (RCNM).

Table 4.13-5: Summary of Federal Highway Administration Roadway Construction Noise Model

Construction Equipment Source at the Phase 1 Residential Building	Distance to Nearest Sensitive Receptor	Sound Level at Residence		
		L_{max}	Acoustical Use Factor (%)	L_{eq}
Backhoe	64 feet	75.4	40	71.4
Crane	64 feet	78.4	16	70.4
Concrete Mixer Truck	64 feet	76.7	40	72.7
Concrete Saw	64 feet	87.4	20	80.4
Compressor (air)	64 feet	75.5	40	71.5
Bulldozer	64 feet	79.5	40	75.5
Excavator	64 feet	78.6	40	74.6
Front End Loader	64 feet	77.0	40	73.0
Grader	64 feet	82.9	40	78.9
Paver	64 feet	75.1	50	72.1
Roller	64 feet	77.9	20	70.9
Tractor	64 feet	81.9	40	77.9

Notes:
L_{eq} = equivalent sound level
L_{max} = maximum sound level
Source: Federal Highway Administration 2006

The construction of the entire proposed project would be conducted in four sequential phases. Each phase would consist of six separate stages, and each stage would use different pieces of construction equipment. The main noise-producing equipment for each construction stage and the approximate distance to the closest noise-sensitive receiver are shown in Table 4.13-6:

Table 4.13-6: Construction Phases Equipment and Distance to Closest Receiver

Construction Stage	Distance to Nearest Sensitive Receptor	Planned Equipment
Stage 1: Demolition	64 feet	Concrete Saw Excavator Rubber-Tired Dozer Tractor Loader Backhoe
Stage 2: Site Preparation	64 feet	Grader Tractor Loader Backhoe Excavator
Stage 3: Grading	64 feet	Concrete Saw Grader Rubber-Tired Dozer Tractor Loader Backhoe
Stage 4: Building Construction	64 feet	Crane Forklift[1] Tractor Loader Backhoe
Stage 5: Paving	64 feet	Cement Mixer Truck Paving Equipment[2] Paver Roller Tractor Loader Backhoe
Stage 6: Architectural Coating	64 feet	Air Compressor

Notes:

1. Noise from a forklift is not included in the RCNM program. Therefore, the forklift was assumed to have the same noise signature as a tractor for this analysis.
2. Noise from paving equipment is not included in the RCNM program. Therefore, paving equipment was assumed to have the same noise signature as a paver for this analysis.

RCNM = Roadway Construction Noise Model

A worst-case condition for construction activity would assume all noise-generating equipment were operating at the same time and at the same distance away from the closest noise-sensitive receiver. Using this assumption, the RCNM program calculated the following combined L_{eq} and L_{max} noise levels from each phase and stage of construction as shown in Table 4.13-7.

Table 4.13-7: Calculated Noise Level from Each Construction Stage

Construction Stage	Distance to Nearest Sensitive Receptor	Calculated L_{eq}	Calculated L_{max}
Stage 1: Demolition	64 feet	84.3 dBA	89.8 dBA
Stage 2: Site Preparation	64 feet	83.0 dBA	87.1 dBA
Stage 3: Grading	64 feet	85.0 dBA	90.3 dBA
Stage 4: Building Construction	64 feet	82.2 dBA	86.6 dBA
Stage 5: Paving	64 feet	82.0 dBA	86.2 dBA
Stage 6: Architectural Coating	64 feet	71.5 dBA	75.5 dBA

Notes:
dBA = A-weighted decibel
L_{eq} = equivalent sound level
L_{max} = maximum sound level

Although noise levels could range into the "clearly unacceptable" range as defined in Figure 4.13-2, increases in noise levels from construction activities would be temporary. The proposed project would also be in compliance with the applicable policies/regulations contained within Mitigation Measure NOI-4 (PBA EIR MM 2.6-1[a]). Implementation of Mitigation Measure NOI-4 (PBA EIR MM 2.6-1[a]) would provide substantial reduction in day and night construction noise and vibration levels by ensuring proper equipment use: locating equipment away from sensitive land uses; and requiring the use of enclosures, shields, and noise curtains (noise curtains typically can reduce noise by up to 10 dB. To the extent that an individual project adopts and implements all feasible mitigation measures described above, construction-noise levels could be reduced by 10 dB, bringing sound levels to acceptable levels. In addition, Mitigation Measure NOI-5 would be required to ensure that a construction site notice that includes pertinent information for the public to stay informed of proposed project construction activities would be required. This construction site notice would include a phone number for the public to call where violations for noise in excess of City standards could be reported. With the implementation of Mitigation Measure NOI-4 (PBA EIR MM 2.6-1[a]) and Mitigation Measure NOI-5, this impact would therefore be less than significant with mitigation.

Level of Significance Before Mitigation

Potentially Significant Impact.

Mitigation Measures

Mitigation Measure NOI-1 (PBA EIR MM 2.6-5), Mitigation Measure NOI-2, Mitigation Measure NOI-3, Mitigation Measure NOI-4 (PBA EIR MM 2.6-1[a]), and Mitigation Measure NOI-5 are required.

MM NOI-2: **Project Fixed-Source Noise. The** noise from all mechanical equipment associated with the proposed project shall comply with Section 1207.4 of the CBC at the neighboring residential receptors. Compliance with this Code would include incorporation of shielding and/or appropriate attenuators to reduce noise from mechanical equipment.

MM NOI-3: **Construction Traffic.** Develop a construction plan to route trucks into the sites avoiding City streets with dense residential populations as much as possible, as approved by the City's Engineering Division. Do not vary the construction traffic route to keep noise levels consistent throughout the construction process as much as possible. Avoiding residential streets keeps construction traffic removed from the sensitive residential receptors.

MM NOI-5: **Construction Activity**. In addition to the Plan Bay Area EIR Mitigation Measure 2.6-(a), post a construction site notice that includes the following information: job site address, permit number, name and phone number of the contractor and owner or owner's agent, hours of construction allowed by code or any discretionary approval for the Site, and City telephone numbers where violations can be reported. The notice shall be posted and maintained at the construction site prior to the start of construction and displayed in a location that is readily visible to the public and approved by the City.

Level of Significance After Mitigation

Less Than Significant Impact With Mitigation.

Impact NOI-2 Generation of excessive groundborne vibration or groundborne noise levels?

Impact Analysis

During construction of the proposed project, equipment such as cranes, excavators, graders, loaders, backhoes, and bulldozers may be used as close as 64 feet from the nearest sensitive receptor across Martin Street. Construction equipment that would be used during proposed project construction would generate vibration levels between 0.001 PPV and 0.051 PPV at 64 feet, as shown in Table 4.13-8. All the groundbourne vibration levels are below the FTA vibration threshold at which human annoyance could occur of 0.10 PPV. Additionally, construction activities would be temporary in nature and would likely occur during normal daytime working hours. Therefore, construction vibrations are not predicted to cause damage to existing buildings or cause annoyance to sensitive receptors. As such, implementation of the proposed project would have a less than significant impact related to vibration.

Table 4.13-8: Vibration Source Levels for Construction Equipment

Type of Equipment	Peak Particle Velocity at 25 Feet	Peak Particle Velocity at 64 Feet	Peak Particle Velocity at 100 Feet	Threshold at which Human Annoyance Could Occur	Potential for Proposed Project to Exceed Threshold
Large Bulldozer	0.089	0.022	0.011	0.10	None
Loaded Trucks	0.076	0.019	0.010	0.10	None
Small Bulldozer	0.003	0.001	0.000	0.10	None
Vibratory Compactor/Roller	0.210	0.051	0.026	0.10	None

Source: FTA, Transit Noise and Vibration Impact Assessment Guidelines, May 2006

Level of Significance Before Mitigation

Less Than Significant Impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less Than Significant Impact.

Impact NOI-3	**For a project located within the vicinity of a private airstrip or airport land use plan or, where such a plan has not been adopted, within two miles of a public airport of public use airport, would the project expose people residing or working in the project area to excessive noise levels?**

Impact Analysis

The project site is not located near an existing airport and is not within an area covered by an existing airport land use plan. The nearest airport is the San Francisco International Airport (SFO), which is located approximately 5.4 miles south of the project site. According to the General Plan, the project site is located outside of the SFO noise contour of 60 dB. Although aircraft-related noise could occasionally be audible at the project site, noise would be extremely minimal. Exterior and interior noise levels resulting from aircraft would be compatible with the proposed project. Therefore, no impact would occur.

Level of Significance Before Mitigation

No Impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

No Impact.

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