4.12 Noise

This section describes the existing noise conditions of the project site and vicinity, identifies associated regulatory requirements, evaluates potential impacts, and identifies mitigation measures related to implementation of the proposed project. This section is based on the Irvine 2045 General Plan (City of Irvine 2024a), noise measurements taken on the project site and vicinity, and data from the project traffic study:

- **Appendix H-1:** Ambient Noise Measurement Data, prepared by Dudek, dated February 2025
- **Appendix H-2:** Construction Noise Modeling Data, prepared by Dudek, dated February 2025
- **Appendix I:** Traffic Study – Irvine Gateway Village, Irvine, California, Planning Area 6, Portola Springs; prepared by LSA; dated December 2024

4.12.1 Existing Conditions

Sound Monitoring Survey

Sound pressure level measurements were conducted near the project site on December 5 through 6, 2024, to quantify and characterize the existing outdoor ambient sound levels. Table 4.12-1 provides the location, date, and time period at which these baseline sound level measurements were performed. Measurements were performed using Rion-branded Model NL-62 and SoftdB "Piccolo" model sound level meter (SLM) equipped with 0.5-inch, pre-polarized condenser microphones with pre-amplifiers. The Rion SLM meets the current American National Standards Institute (ANSI) standard for a Type 1 (Precision Grade) SLM. The Piccolo SLM meets the current ANSI standard for a Type 2 (General Use) SLM. The accuracy of both SLMs was verified using a field calibrator before and after the measurements, and the measurements were conducted with the microphone positioned approximately 5 feet above the ground.

Six short-term (ST) sound level measurement locations (ST1 through ST6) that represent existing noise-sensitive receivers were selected on and near the project site. These locations are depicted as receivers ST1 through ST6 on Figure 4.12-1, Project Location and Sound Monitoring Locations, and were selected to characterize the baseline outdoor ambient sound levels at the project site and for nearby noise-sensitive receptors (see Figure 4.12-1). The measured sound levels and primary sound sources at locations ST1 through ST6 are provided in Table 4.12-1.

Table 4.12-1. Measured Baseline Outdoor Ambient Sound Levels, December 5, 2024

Site	Location/Address (Sound Sources)	Date/Time	L_{eq} (dBA)	L_{90} (dBA)	L_{50} (dBA)	L_{10} (dBA)
ST1	Western Site Boundary, near substation (distant traffic, industrial noise, and natural sounds)	15:10 to 15:25	59	46	51	57
ST2	Southern Site Boundary, 30 feet from center of Portola Parkway (local traffic)	15:35 to 15:50	74	56	69	78
ST3	Eastern Site Boundary, 20 feet from center of Bee Canyon Access Road (local traffic and natural sounds)	16:03 to 16:19	67	45	49	66
ST4	Residences south of site (local and distant traffic, natural sounds)	13:59 to 14:14	47	39	45	51
ST5	North of site (industrial noise and distant traffic)	14:50 to 15:05	62	47	57	64

Table 4.12-1. Measured Baseline Outdoor Ambient Sound Levels, December 5, 2024

Site	Location/Address (Sound Sources)	Date/Time	L_{eq} (dBA)	L_{90} (dBA)	L_{50} (dBA)	L_{10} (dBA)
ST6	Center of site (distant traffic, distant industrial, aircraft)	14:28 to 14:43	49	45	47	51

Source: Appendix H-1.
Notes: L_{eq} = equivalent continuous sound level (time-averaged sound level); dBA = A-weighted decibels; L_{90} = sound level exceeded 90% of the time; L_{50} = sound level exceeded 50% of the time; L_{10} = sound level exceeded 10% of the time; ST = short-term sound measurement location.

Additionally, three long-term (LT) sound measurement locations (LT1 through LT3) that represent the project site and existing noise-sensitive receptors were selected on and near the project site (see Figure 4.12-1). The sound measurements at locations LT1 through LT3 spanned a full 24-hour cycle and equivalent continuous sound level (L_{eq}), sound level exceeded 10% of the time (L_{10}), sound level exceeded 50% of the time (L_{50}), and sound level exceeded 90% of the time (L_{90}) metrics were measured.

While L_{eq} provides insight into the overall sound exposure level detected by an SLM, the L_{90} value is a good indicator of the background sound environment, offering a perspective clear of short-lived disturbances. Where the L_{10} value offers the perspective of a higher percentage of fluctuating sound levels, the L_{50} level represents the median sound levels of the measurement period. Beyond the summarized information presented in Table 4.12-1, detailed sound measurement data, such as plots displaying L_{eq}, L_{10}, L_{50}, and L_{90} levels derived from the LT1 through LT3 measurement data, field survey photos, and weather data are included in Appendix H-1, Ambient Noise Measurement Data.

Sensitive Receptors

Noise- and vibration-sensitive land uses are typically locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation or open space areas would be considered noise and vibration sensitive and may warrant unique measures for protection from intruding noise. Existing sensitive receptors in the vicinity of the project site consist of the Stonegate residential development located to the south of the project site, across Portola Parkway.

4.12.2 Relevant Plans, Policies, and Ordinances

Federal

Federal Transit Administration

In its Transit Noise and Vibration Impact Assessment guidance manual, the Federal Transit Administration (FTA) recommends a daytime construction noise level threshold of 80 A-weighted decibels (dBA) L_{eq} over an 8-hour period (FTA 2018) when detailed construction noise assessments are performed to evaluate potential impacts to community residences surrounding a project site. Although this FTA guidance is not a regulation, it can serve as a quantified standard in the absence of such noise limits at the state and local jurisdictional levels.

State

California Code of Regulations, Title 24

Title 24 of the California Code of Regulations sets standards that new developments in California must meet. According to Title 24, interior noise levels are not to exceed 45 dBA Community Noise Equivalent Level (CNEL) in any habitable room.

California Department of Health Services Guidelines

The California Department of Health Services has developed guidelines of community noise acceptability for use by local agencies (OPR 2017). Selected relevant levels are listed here:

- **Below 60 dBA CNEL:** normally acceptable for low-density residential use
- **50 to 70 dBA CNEL:** conditionally acceptable for low-density residential use
- **Below 65 dBA CNEL:** normally acceptable for high-density residential use and transient lodging
- **60 to 70 dBA CNEL:** conditionally acceptable for high-density residential, transient lodging, churches, educational, and medical facilities

The normally acceptable exterior noise level for high-density residential use is up to 65 dBA CNEL. Additionally, this exterior noise level limit is consistent with the City of Irvine (City) General Plan Noise Element, which considers multifamily units to be noise-sensitive land uses.

Caltrans Vibration Standards

The California Department of Transportation (Caltrans) conducted extensive research on human annoyance and damage to structures caused by vibration from short-term construction activities and from long-term highway operations and has published criteria for vibration management (Caltrans 2020). These criteria established by Caltrans are commonly used to assess vibration impacts from all types of projects and activities. Caltrans uses a threshold of 0.24 inches per second (in/sec) peak particle velocity (PPV) for annoyance to persons due to a transient source such as construction. For commercial buildings constructed of concrete and steel, Caltrans identifies a damage threshold of 0.5 in/sec PPV. For residential structures employing concrete foundation and wood frame construction, Caltrans identifies a conservative damage threshold vibration level standard of 0.3 in/sec PPV (Caltrans 2020).

Local

City of Irvine Noise Ordinance

Chapter 2 of Division 8 of the City's Municipal Code has adopted noise regulations "in order to control unnecessary, excessive and annoying noise" (City of Irvine 2024b).

The City's Noise Ordinance establishes hourly noise level standards for various land use categories affected by stationary non-transportation noise sources (see Table 4.12-2). The ordinance also regulates the timing of construction activities and establishes noise performance standards for other sources, such as commercial deliveries and landscape equipment.

Table 4.12-2. City of Irvine Exterior Noise Performance Standards

Receiving Land Use	Noise Limit (dBA L_{eq}) (7:00 a.m. to 10:00 p.m.)	Noise Limit (dBA L_{eq}) (10:00 p.m. to 7:00 a.m.)
Residential	60	55
Residential Portions of Properties Zoned for Multi-Use	60	55
Commercial, Industrial, Manufacturing	70	60
Office/Institutional (Hospital, School Classroom, Church, Library)	60	55

Source: Irvine Municipal Code, Title 6, Division 8, Chapter 2, Section 6-8-204.
Notes:

- The noise standards shall be increased by 5 dB for consecutive sound durations less than 15 minutes, by 10 dB for consecutive sound durations less than 5 minutes, and by 15 dB for consecutive sound durations less than 1 minute.
- Each of the noise standards shall be reduced by 5 dB for impact noise, predominant tone noise, or for noises consisting of speech or music.
- In the event the existing ambient noise level exceeds the noise standard, the maximum allowable noise level under said category shall be increased to the ambient noise level.

The City's Noise Ordinance limits construction activities to Monday through Friday from 7:00 a.m. to 7:00 p.m. and Saturday from 9:00 a.m. to 6:00 p.m. No construction activities are permitted outside of these hours or on Sundays and federal holidays, except Columbus Day, unless a temporary waiver is granted by the Chief Building Official or his or her authorized representative. Trucks, vehicles, and equipment that are making or are involved with material deliveries, loading or transfer of materials, equipment service, or maintenance of any devices or appurtenances for or within any construction project in the City must not be operated or driven on City streets outside of these hours or on Sundays and federal holidays unless a temporary waiver is granted by the City. Any waiver granted takes impacts on the community into consideration. No construction activity and agricultural operations are permitted outside of these hours except in emergencies, including maintenance work on the City rights-of-way that might be required.

According to the Noise Ordinance, deliveries to or pickups from any commercial property sharing a property line with any residential property may occur daily from 7:00 a.m. to 10:00 p.m. No deliveries to or pickups from any such properties may occur outside of these hours.

Based on guidance in the City's Noise Ordinance, noise from air-conditioning, refrigeration, or heating equipment for residences or other structures and pumps, filters, or heating equipment for pools or reservoirs may not exceed the higher of the following: (1) the noise standards in Table 4.12-2 or (2) 5 decibels (dB) above the ambient noise level.

City of Irvine General Plan

The City's General Plan Noise Element "contributes to a healthy and safe environment by minimizing noise impacts in the City and is a crucial component of fostering a high quality of life for residents." The Noise Element establishes goals and policies to "promote compatible growth and minimize noise exposure." The City establishes an exterior noise standard of 65 dBA CNEL for residential land uses and parks. The noise standards (hourly noise level standards for stationary noise sources) shown in Table 4.12-3 are from Table 1 of the General Plan Noise Element.

Table 4.12-3. City of Irvine Noise Standards, Stationary Sources

Receiving Land Use	Time of Day	Location	Noise Level (dBA) Not to Be Exceeded for Period out of 1 Hour				
			30 min.	15 min.	5 min.	1 min.	Anytime
1: Hospitals, libraries, churches, schools, and residential properties	7:00 a.m. to 10:00 p.m.	Exterior	55	60	65	70	75
		Interior	—	—	55	60	65
	10:00 p.m. to 7:00 a.m.	Exterior	50	55	60	65	70
		Interior	—	—	45	50	55
2: Professional office and public institutional properties	Anytime	Exterior	55	60	65	70	75
		Interior	—	—	55	60	65
3: Commercial properties excluding professional office properties	Anytime	Exterior	60	65	70	75	80
		Interior	—	—	55	60	65
4: Industrial properties	Anytime	Exterior	70	75	80	85	90
		Interior	—	—	55	60	65

Source: City of Irvine 2024a, Table 1.

The following General Plan policies would also be applicable to the project (City of Irvine 2024a):

Goal 1. Noise Control Through Land Use Planning and Design

Objective N-1. Maintain healthy and safe noise environments consistent with the standards in Table 1 [reproduced as Table 4.12-3 in this EIR section] through site design and location.

Policy (a): Require all plans submitted for development review to demonstrate whether the plan area is located within an existing or future Noise Element noise contour, including vehicle, rail, and aircraft noise contours.

Policy (b): Avoid new residential development within the 65 dBA CNEL contour for aircraft, roadway, or rail noise unless "normally compatible" exterior noise standards can be maintained in private open spaces, and interior noise standards can be achieved through building design.

Policy (c): Require noise studies to be prepared in accordance with the City's environmental review procedure for all projects that are not "clearly compatible" with the future noise level at the site. Require proposed development projects located in areas that are not "clearly compatible" to demonstrate the incorporation of adequate noise attenuation techniques to achieve compatible interior noise levels.

Policy (d): Require noise attenuation for private usable outdoor spaces (backyards and single-family housing developments, and balconies or recreation areas in multifamily housing developments) in all developments where projected exterior noise levels exceed "normally compatible" exterior noise standards.

Policy (e): Require the following Single-Event Noise Standard for noise-sensitive land uses within the 60 CNEL of aircraft and railroad noise sources:

- The maximum interior noise levels of the loudest 10% of single noise events [$L_{max(10)}$] shall not exceed 65 dBA between 7 a.m. and 7 p.m. nor 55 dBA between 7 p.m. and 7 a.m. for typical occupancy. Noise monitoring conducted to determine maximum single-event noise must include representative aircraft operation.

Policy (f): Require noise studies conducted per Policy (c) to identify all the measures necessary to reduce noise levels to meet the interior and exterior noise compatibility standards (Table 1 [refer to Table 4.12-3 in this section]) and Single-Event Noise Standard (Objective N-1, Policy e), as applicable.

Policy (g): Consider conditioning noise-sensitive land uses such as hospitals, libraries, churches, and schools located in areas not "clearly compatible" to demonstrate how exterior noise exposure would be minimized, such as building orientation, shielding, or limiting outdoor programs.

Policy (h): Require that mixed-use and multi-family residential developments demonstrate noise compatibility between uses. Structures will adequately isolate noise between adjacent uses through features such as orientation, window, and building insulation, or separation of common walls. Nuisance noise areas such as loading areas, parking lots, driveways, trash enclosures, mechanical equipment, and other noise sources will be located away from the residential portion of the development when physically feasible.

Policy (i): Require that new development plans demonstrate that implementation would maintain clearly or normally compatible noise levels at existing receptors. In areas where existing ambient noise levels exceed acceptable noise criteria, require that the project demonstrates that implementation would not result in a more than 3 dBA CNEL change in ambient conditions, including from project-generated vehicle noise sources.

Goal 2. Stationary Noise Sources

Objective N-2. Reduce noise from non-transportation sources such that City residents are not exposed to stationary noise levels that exceed City Noise Ordinance standards.

Policy (a): Require any new construction to meet the City Noise Ordinance standards. The project applicant will be required to submit construction-related noise reduction strategies for review and approval prior to the issuance of grading permits.

Policy (b): Require project applicants to depict, on any appropriate development application review (including, but not limited to, zone change, subdivisions, conditional use permit, site plan, and building plans), any potential noise sources known at the time of submittal and reduction measures that ensure these noise sources meet the City Noise Ordinance standards. Such sources include, but are not limited to, the following:

- Truck pickup and loading areas.

- Mechanical and electrical equipment such as air conditioning, swimming pool pumps and filters, and spa pumps.[1]
- Exterior nuisances such as speaker boxes and outdoor public address systems.

Policy (c): Limit the hours of operation for portions of parks and active recreation uses adjacent to residential areas to daytime hours to minimize disturbance to residents.

Policy (d): Require outdoor events with amplified noise to implement best management practices to reduce nuisance noise exposure.

Goal 3. Noise Abatement

Objective N-3. Achieve maximum efficiency in noise abatement efforts through establishing minimum standards, intergovernmental coordination, and public information programs.

Policy (g): Minimize the use of noise barriers to reduce noise exposure. Consider other attenuation strategies, such as alternative development siting, soundproofing sensitive receptors, building orientation and setbacks, providing buffer areas or landscape berms, modifying source operating hours, modifying roadway design, or utilizing quieter pavement strategies, as applicable, prior to proposing noise barrier installation.

Policy (o): Limit "through truck traffic" to designated routes to minimize noise impacts to residential neighborhoods and other noise-sensitive uses.

Goal 4. Ground-Borne Vibration

Objective N-4. Minimize exposure to ground-borne vibration such that City residents are not exposed to nuisance vibration or potential building damage.

Policy (b): Require all plans submitted for development review that include the use of pile driving and blasting during construction to consider alternative methods to minimize the potential for building damage and temporary nuisance exposure.

Policy (c): Require all plans submitted for development review to utilize vibration standards published by the Federal Transit Administration to evaluate the potential effects of vibration exposure from new vibration sources, such as construction, or siting of new receptors near existing vibration sources, such as rail operations

[1] This bulleted item is shown here as a single bulleted item. In the General Plan, it is presented as two separate bulleted items, split into "Mechanical and electrical equipment such as air conditioning, swimming" and "Pool pumps and filters, and spa pumps."

4.12.3 Thresholds of Significance

The significance criteria used to evaluate the project impacts related to noise are based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines. According to Appendix G, a significant impact related to noise would occur if the project would result in:

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.
2. Generation of excessive ground-borne vibration or ground-borne noise levels.
3. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, exposure of people residing or working in the project area to excessive noise levels.

In light of the above significance criteria, this analysis uses the following standards to evaluate potential noise and vibration impacts.

- **Construction Noise.** The City's Municipal Code limits construction to between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday and Saturday from 9:00 a.m. to 6:00 p.m. No construction activities shall be permitted outside of these hours or on Sundays and federal holidays, except Columbus Day. Construction occurring within these hours is exempt from the City's noise limits. For informational purposes, this analysis compares project construction-generated sound levels to the FTA construction noise level threshold of 80 dBA L_{eq} over an 8-hour period.
- **Transportation Noise.** In accordance with the City's General Plan Policy N-1(i), a noise impact due to transportation noise would be considered significant if project-generated traffic causes the existing levels to increase by more than 3 dB CNEL at a noise-sensitive location.
- **Stationary Operations Noise.** Project operational sound sources are restricted to the City's limits as shown in Table 4.12-3, City of Irvine Noise Standards, Stationary Sources, which are more conservative than those shown in Table 4.12-2, City of Irvine Exterior Noise Performance Standards. For residential properties, the limit is 55 dBA L_{50} during daytime hours (7:00 a.m. to 10:00 p.m.) and 50 dBA L_{50} during nighttime hours (10:00 p.m. to 7:00 a.m.).
- **Construction Vibration.** Caltrans Vibration Guidance (Caltrans 2020) indicates that a vibration velocity of 0.24 in/sec PPV received at a structure would be considered annoying by occupants and recommends that a vibration level of 0.3 in/sec PPV be used as the threshold for building damage risk to residential structures and 0.5 in/sec PPV be used as the threshold for building damage to modern industrial and commercial structures. These thresholds are used in this analysis to determine vibration impacts.

4.12.4 Impacts Analysis

1. ***Would the project result in 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?***

Short-Term On-Site Construction Noise

Less-Than-Significant Impact. Construction activities include temporary noise and vibration sources with emission levels varying from hour to hour and day to day, depending on the equipment in use, the operations performed, and the distance between the source and receptor. Construction noise modeling was performed using a Microsoft Excel–based noise prediction model (FHWA 2006, 2008). Input variables include the equipment type (e.g., backhoe, crane, truck), the number of equipment pieces, the duty cycle for each piece of equipment (i.e., the percentage of each hour the equipment typically works), and the distance from the sensitive receptor. Sound source information was obtained from the Noise Source Database developed under National Cooperative Highway Research Program 25-49 (NCHRP 25-49), Development of a Highway Construction Noise Prediction Model (NASEM 2022).

Pile driving is not anticipated as a method of construction. Table 4.12-4 provides a list of the hourly average and maximum sound levels generated by various powered equipment that could be associated with construction of the project, measured at a distance of 50 feet using a "slow" response time constant (1 second). Usually, construction equipment operates in alternating cycles of full power and low power, producing average noise levels over time that are less than the maximum noise level. The average sound level of construction activity also depends on the amount of time that the equipment operates and the intensity of construction activities during that time.

Table 4.12-4. Sound Levels of Typical Construction Equipment

Equipment	Average Sound Level (dBA L_{eq}) – 50 Feet from Source	Maximum Sound Level (dBA L_{max}) – 50 Feet from Source
Air compressor	66	67
Aerial lift (man lift)	72	73
Backhoe	76	84
Compactor – plate	N/D	75
Compactor – roller	82	83
Concrete mixer	81	82
Concrete saw	85	88
Crane – mobile	74	76
Dozer	80	86
Forklift	N/D	88
Generator	67	68
Grader	N/D	79
Horizontal bore drill	87	88
Loader	72	81
Paving – asphalt	N/D	83
Paving – concrete	85	88

Table 4.12-4. Sound Levels of Typical Construction Equipment

Equipment	Average Sound Level (dBA L_{eq}) – 50 Feet from Source	Maximum Sound Level (dBA L_{max}) – 50 Feet from Source
Pump	73	74
Scraper	N/D	92
Flatbed truck	N/D	74
Welding machine	71	72

Source: NASEM 2022.
Notes: dBA = A-weighted decibel; L_{eq} = average noise level equivalent; L_{max} = maximum instantaneous noise level; N/D = no data available. Equipment without average (L_{eq}) noise levels are non-stationary and are best represented by maximum instantaneous noise level (L_{max}), as shown in this table.

Noise emissions from project construction were calculated at the nearest noise-sensitive land uses, residences located about 250 feet to the south of the project site, across Portola Parkway. The anticipated equipment to be used for construction of the project is shown in Appendix H-2, Construction Noise Modeling Data, for each phase of project construction. Aggregate sound emissions from project construction activities, broken down by sequential phase of construction, were predicted for the worst-case construction activity occurring along the closest construction boundary to the residences and at the center of the site. Shielding provided by the berm and sound wall located along the south side of Portola Parkway, which would be anticipated to provide 10 to 15 dB of sound reduction, is not included in these calculations. Additionally, note that as buildings are built on the south side of the site, construction occurring to the north of these structures will be shielded by the existing structures, providing substantial additional reduction that is likewise not included in the calculations. The results are summarized in Table 4.12-5.

Table 4.12-5. Construction Noise Levels, Worst Case

Task/Activity	Closest Residence from Project Boundary (250 Feet)	Closest Residence from Center of Construction (1,900 Feet)
	$L_{eq\ 8hr}$ (dBA)	$L_{eq\ 8hr}$ (dBA)
Land Development and Park Amenity Construction		
Demolition	71	51
Mass grading	80	62
On-site utilities	66	46
Paving	72	52
Building construction	75	55
Architectural coating	50	30
Off-site improvements	64	44
Landscaping	61	41
In-Tract Improvements and Housing Construction (Phases 1A, 1B, 2A, 2B, 2C, 2D, 3A, 3B, 3C, 3D, and 3E)		
Rough grading	80	60
In-tract improvements (on-site utilities)	66	46
In-tract paving	78	58
Site preparation and finish grading for housing construction	65	46
Landscaping	61	41

Table 4.12-5. Construction Noise Levels, Worst Case

Task/Activity	Closest Residence from Project Boundary (250 Feet)	Closest Residence from Center of Construction (1,900 Feet)
	$L_{eq\ 8hr}$ (dBA)	$L_{eq\ 8hr}$ (dBA)
Building construction and architectural coating	75	55

Source: Dudek 2025.
Notes: $L_{eq\ 8hr}$ = average noise level equivalent over an 8-hour period; dBA = A-weighted decibel.

It is anticipated that all construction would occur within the City's allowable hours of 7:00 a.m. to 7:00 p.m. Monday through Friday and Saturday from 9:00 a.m. to 6:00 p.m. Construction activities occurring within the City's allowable hours are exempt from the City's noise limits. For informational purposes, this analysis compares project construction–generated sound levels to the FTA construction noise level threshold of 80 dBA L_{eq} over an 8-hour period (FTA 2018).

As indicated in Table 4.12-5, worst-case construction sound levels would range from 50 to 80 dBA $L_{eq\ 8hr}$ at the nearest residence when construction is located at the project boundary adjoining this residence, not taking shielding into account. Worst-case construction sound levels would range from 30 to 62 dBA $L_{eq\ 8hr}$ at the nearest residence when construction is spread throughout the site. Construction activities would occur during the City's allowable hours and would comply with the FTA-recommended construction noise limit of 80 dBA $L_{eq\ 8hr}$ with best management construction practices only. Shielding provided by the existing berm and sound wall located along the southern side of Portola Parkway and by any intervening project structures would reduce this sound exposure further. Sound levels inside the residence would be anticipated to be about 15 dB lower with windows open and 25 dB lower with windows closed. Temporary noise impacts would be less than significant.

Off-Site Construction Traffic Noise

Less-Than-Significant Impact. The project would result in local, short-term increases in roadway noise as a result of construction traffic. Project-related construction traffic would include workers commuting to and from the project site as well as vendor and haul trucks bringing or removing materials. Table 4.12-6 shows the construction trips by day for each construction phase.

Table 4.12-6. Construction Trip Generation Estimates

Task/Activity	Average Daily Workers	Average Daily Vendor Trucks	Daily Haul Trucks/ Other Trucks[a]
Land Development and Park Amenity Construction			
Demolition	10	0	3
Mass grading	15	0	0
On-site utilities	12	0	0
Paving	12	0	0
Building construction	40	0	1
Architectural coating	6	0	0
Off-site improvements	7	0	1
Landscaping	10	0	1

Table 4.12-6. Construction Trip Generation Estimates

Task/Activity	Average Daily Workers	Average Daily Vendor Trucks	Daily Haul Trucks/ Other Trucks[a]
In-Tract Improvements and Housing Construction (Phases 1A, 1B, 2A, 2B, 2C, 2D, 3A, 3B, 3C, 3D, and 3E)			
Rough grading	14	14	0
In-tract improvements (on-site utilities)	6	6	0
In-track paving	18	18	1
Site preparation and finish grading for housing construction	8	8	1
Landscaping	10	10	0
Building construction and architectural coating	40	40	1

Source: Brookfield, pers. comm., 2025.
Note:
[a] Daily haul trucks were calculated by dividing the total number for the given phase by the duration of the phase and rounding up to the nearest whole number.

As shown in Table 4.12-6, the highest number of average daily construction-related trips to and from the project site for all construction phases would be 40 worker trips, 40 vendor trips, and 1 haul truck trip occurring during the building construction and architectural coating construction phase. However, there are periods in which multiple phases may be occurring simultaneously. During the worst-case period, finish grading and building construction would be occurring for Phases 1B, 2A, 2B, 2C, 3A, 3B, and 3C at the same time as in-tract improvements for Phases 2B, 2C, and 3B. This combination of phasing would result in 478 worker trips, 478 vendor trips, and 17 haul truck trips occurring per day. Because each vehicle would need to make two trips, one to access the site and one to depart, this would result in 956 light vehicles, 956 medium trucks, and 34 heavy trucks per day during the worst-case period.

The only sensitive receptors in the immediate vicinity of the project are residences located along Portola Parkway, which currently carries an average daily traffic (ADT) volume of 17,200 vehicles per day based on the project traffic study (Appendix I, Traffic Study). Using FTA's Traffic Noise Model with traffic volumes provided by the project's traffic study, traffic along Portola Parkway is modeled to generate a peak-hour sound level of 54 dBA L_{eq} under existing conditions at these residences. Assuming a worst-case scenario with all construction traffic occurring during peak hours along this section of Portola Parkway and taking into account the traffic mix, the existing-plus-construction traffic volumes would result in a peak-hour traffic noise level of 56 dBA L_{eq}. More realistic conditions, with construction traffic split along the roadway network, would result in lower increases. The increase in traffic noise levels resulting from project construction traffic would be less than 3 dB at all noise-sensitive locations. Therefore, impacts from project-related construction traffic noise would be less than significant and no mitigation measures are required.

Off-Site Operational Traffic Noise

Less-Than-Significant Impact. Based on the project traffic study (Appendix I), the project is anticipated to generate an ADT of 10,825. Traffic noise levels along roadways in the vicinity of the project site were modeled using FTA's Traffic Noise Model with traffic volumes provided by the project's traffic study. The results of this modeling are provided in Table 4.12-7. The locations of all modeling points are provided on Figure 4.12-2.

Table 4.12-7. Off-Site Traffic Noise Modeling Results

Modeled Receiver Tag: Location Description	2024 Existing Noise Level (dBA CNEL)	Existing Plus Project Noise Level (dBA CNEL)	Project-Related Noise Level Increase (dB)	Existing Noise-Sensitive Location?	Noise Increase Threshold (dB)	Significant Impact?
ST1: West of Jeffrey Road	56	71	14.7	No	N/A	No
ST2: North of Portola Parkway	72	72	0.4	No	N/A	No
ST3: West of Bee Canyon Access Road	43	48	4.6	No	N/A	No
ST4: Residences south of Portola Parkway	51	52	0.7	Yes	3	No
ST5: North end of project site	38	52	14.6	No	N/A	No
ST6: Center of project site	50	52	2	No	N/A	No
M1: Residences south of Portola Parkway	54	55	1	Yes	3	No
M2: Residences east of Jeffrey Road	59	61	1.4	Yes	3	No
M3: Residences southwest of Portola Parkway and project site	61	61	0.7	Yes	3	No
M4: Residences south of Portola Parkway and the Orchard Hills development	62	62	0.5	Yes	3	No
M5: Residences west of Jeffrey Road	54	55	1.5	Yes	3	No
M6: Residences south of Portola Parkway	51	51	0.7	Yes	3	No

Notes: dBA = A-weighted decibel; CNEL = Community Noise Equivalent Level; dB = decibel; ST = short-term; N/A = not applicable; M = modeled location.

As shown in Table 4.12-7, traffic noise increases greater than 3 dB would occur along Bee Canyon Road and Jeffrey Road, north of Portola Parkway. There are no existing noise-sensitive land uses along these roadways. Traffic noise levels along roadways adjacent to residences would increase by up to 1.5 dB as a result of the project. Project-generated traffic would not result in traffic noise level increases of 3 dB or greater at existing noise-sensitive locations; therefore, impacts would be less than significant.

On-Site Operational Noise

Less-Than-Significant Impact. The project would include sound-producing equipment and activities that are associated with normal residential use. Residential air-conditioning condensers will be located at grade in front-yard patios, side yards, and/or rear yards, depending on the product type (single-family attached vs. detached). Roof-mounted air-conditioning equipment and ground-level condensers would be utilized for the multifamily buildings. Typical multifamily or mixed-use building air-conditioning units are anticipated to generate noise levels of 50 to 60 dBA at 50 feet from the equipment, depending on the equipment selected. Single-family residential units are typically quieter. The closest off-site sensitive locations are residences located about 250 feet to the south of the project site, across Portola Parkway, and are shielded by a large berm and solid perimeter walls that would act as a sound barrier. At a distance of 250 feet, air-conditioning units would generate sound levels of 37 to 47 dBA. Shielding from the berm, solid perimeter walls, and intervening buildings would provide an additional 10 to 20 dB of reduction or more, resulting in levels below 37 dBA. As a result, sound from on-site operational equipment would be indistinguishable from the existing background sound environment (see Table 4.12-1).

Additionally, the project proposes three parks: Gateway Village Park, Paseo Park, and South Park. Gateway Village Park, which would be about 1,500 feet from residences to the south, would include a group picnic and outdoor kitchen area, a pool and spa with associated pool equipment, outdoor games, a fire pit, and a children's play area. Paseo Park would include various play elements, a picnic area, and a community garden and would be about 2,400 feet from residences to the south. South Park would be about 3,300 feet from residences to the south. All three of these parks would be located at great distances from existing noise-sensitive areas, with significant shielding provided by intervening project residences and community walls. As a result, any sounds generated in the parks (pool equipment, loud voices, children playing) would be inaudible at existing residences to the south. Impacts would be less than significant.

2. Would the project result in generation of excessive ground-borne vibration or ground-borne noise levels?

Less-Than-Significant Impact. Construction activity can result in varying degrees of ground vibration and ground-borne noise at local receptors, depending on the equipment and methods used, distance to the affected structures, and soil type. For many years, Caltrans has been assembling data for vibration and ground-borne noise levels generated by operation of heavy construction equipment during the building of transportation projects. The vibration and ground-borne noise levels from the use of such equipment are representative for other types of construction efforts, not just transportation projects, and are therefore widely employed to assess vibration and ground-borne noise levels from heavy equipment use for any effort. The project does not propose pile driving, which is one of the highest construction vibration generators, as a method of construction. A list of vibration levels typically generated by construction equipment anticipated to be used for the project, as provided by Caltrans (2020), is illustrated in Table 4.12-8.

Ground-borne vibration attenuates rapidly, even over short distances. The attenuation of ground-borne vibration as it propagates from source to receptor through intervening soils and rock strata can be estimated with expressions found in Caltrans guidance (Caltrans 2020). The following equation is used to calculate PPV at any distance of interest from the operating construction equipment:

$$PPV_{rcvr} = PPV_{ref} * (25/D)^{1.1}$$

In the above equation, PPV_{rcvr} is the predicted vibration velocity at the receiver position, PPV_{ref} is the reference value at 25 feet from the vibration source (as listed in Table 4.12-8), and D is the actual horizontal distance to the receiver.

Table 4.12-8. Vibration Velocities for Typical Construction Equipment

Equipment	PPV at 25 Feet (Inches per Second)
Vibratory roller	0.210
Large bulldozer	0.089
Loaded trucks	0.076
Small bulldozer	0.003

Source: Caltrans 2020.
Note: PPV = peak particle velocity.

The City does not have quantitative thresholds for construction vibration that would be applicable to the project; therefore, it is appropriate to employ a numeric standard adopted by another agency. Caltrans (2020) has established a construction-related damage limit of 0.25 in/sec PPV for historic and old buildings, 0.3 in/sec PPV for older residential structures, and 0.5 in/sec PPV for new residential and modern commercial/industrial structures. The applicable threshold for project-attributed construction vibration would be 0.3 in/sec PPV at the closest residences and 0.5 in/sec PPV at the closest industrial building.

The closest residential structures to the project site are about 250 feet to the south, across Portola Parkway, and the closest nonresidential structure is about 50 feet to the north. Using the vibration source level of construction equipment provided in Table 4.12-8, the distance to the closest structures, and the equation supplied in the Caltrans (2020) construction ground-borne noise assessment methodology, the project construction-related vibration levels were calculated as shown in Table 4.12-9.

Table 4.12-9. Construction Vibration Levels at Nearest Structures

Equipment	In/Sec PPV at Nearest Residencial Structure (250 feet)	In/Sec PPV at Nearest Nonresidential Structure (50 feet)
Vibratory Roller	0.017	0.098
Large Bulldozer	0.007	0.042
Loaded Trucks	0.006	0.035
Small Bulldozer	0.000	0.001

Source: Caltrans 2020.
Notes: in/sec = inches per second; PPV = peak particle velocity.

The applicable damage threshold for project-attributed construction vibration would be 0.3 in/sec PPV at the closest residence and 0.5 in/sec PPV at the nearest nonresidential structure. As shown in Table 4.12-9, project construction would result in vibration levels well below these thresholds and below the Caltrans annoyance level of 0.24 in/sec PPV. Vibration impacts of the project would therefore be less than significant.

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

No Impact. The closest airport to the proposed project site is John Wayne Airport, which is about 8 miles southwest of the project site. There are no public or private airports within 2 miles of the project site. Therefore, the project would not expose people residing or working in the project area to excessive noise levels; no impact would occur.

Impact Summary

Impacts related to a substantial increase in ambient noise levels in the vicinity of the project in excess of standards and to generation of excessive ground-borne vibration or noise levels would be less than significant. No impacts regarding excessive noise levels in the vicinity of an airport would occur.

4.12.5 Mitigation Measures

No significant noise or vibration impacts were identified in the analysis in this section; therefore, no mitigation measures are required.

4.12.6 Level of Significance After Mitigation

No mitigation is required; therefore, noise and vibration impacts would remain less than significant.

4.12.7 Cumulative Impacts

Short-Term Construction Noise

The project would result in temporary noise increases during construction activities, as discussed in Section 4.12.4, Impacts Analysis. The construction period of future developments under the project has the potential to overlap with the construction of other development projects in the City but would not be anticipated to worsen these construction noise estimates in light of the physical distance between such activities and the different receivers that are closest to the different phase area boundaries. Therefore, cumulative impacts associated with project construction noise would be less than significant.

Off-Site Operational Traffic Noise

Based on the project traffic study (Appendix I), the project is anticipated to generate an ADT of 10,825. Future buildout traffic noise levels with and without the project were modeled along roadways in the vicinity of the project site using FTA's Traffic Noise Model with traffic volumes provided by the project's traffic study. The results of this modeling are provided in Table 4.12-10. The locations of all modeling points are provided on Figure 4.12-2.

Table 4.12-10. Off-Site Traffic Noise Modeling Results

Modeled Receiver Tag: Location Description	Buildout Noise Level (dBA CNEL)	Buildout Plus Project Noise Level (dBA CNEL)	Project-Related Noise Level Increase (dB)	Existing Noise-Sensitive Location?	Noise Increase Threshold (dB)	Significant Impact?
ST1: West of Jeffrey Road	68	72	4.2	No	N/A	No
ST2: North of Portola Parkway	73	74	0.4	No	N/A	No
ST3: West of Bee Canyon Access Road	46	49	2.6	No	N/A	No
ST4: Residences south of Portola Parkway	52	53	0.6	Yes	3	No
ST5: North end of project site	49	53	4.3	No	N/A	No
ST6: Center of project site	52	54	1.4	No	N/A	No
M1: Residences south of Portola Parkway	55	56	0.8	Yes	3	No
M2: Residences east of Jeffrey Road	60	61	1.2	Yes	3	No
M3: Residences southwest of Portola Parkway and project site	62	62	0.6	Yes	3	No
M4: Residences south of Portola Parkway and the Orchard Hills development	63	63	0.4	Yes	3	No
M5: Residences west of Jeffrey Road	54	56	1.3	Yes	3	No
M6: Residences south of Portola Parkway	52	52	0.6	Yes	3	No

Notes: dBA = A-weighted decibel; CNEL = Community Noise Equivalent Level; dB = decibel; ST = short-term; N/A = not applicable; M = modeled location.

As shown in Table 4.12-10, buildout traffic noise increases greater than 3 dB that are attributable to the project would occur only along Jeffrey Road, north of Portola Parkway. There are no existing noise-sensitive land uses along this section of roadway. Buildout traffic noise levels along roadways adjacent to residences would increase by up to 1.3 dB as a result of the project. Because project-generated traffic would not result in buildout traffic noise level increases of 3 dB or greater at existing noise-sensitive locations, the incremental effect of the project

on off-site traffic noise would not be cumulatively considerable. Cumulative off-site traffic noise impacts would be less than significant.

On-Site Operational Noise

Project implementation would include permanent on-site sound sources (e.g., air-conditioning, refrigeration, or heating equipment and park activities), as addressed in Section 4.12.4. A cumulative impact could occur if sound produced from such sources due to implementation of the project were to combine with sound produced from the operation of other unrelated projects in the vicinity to create a cumulatively significant permanent increase in ambient sound levels. However, sound emission from these sources attenuates with distance and is shielded by structures and terrain. As described in Section 4.12.4, sound from on-site operational sources would be indistinguishable from background levels at the nearest sound-sensitive locations. Additionally, the operation of the project, along with the operation of other unrelated projects, would be subject to applicable requirements from the City's Noise Ordinance, which limits the exterior noise levels at residences. Therefore, cumulative impacts to outdoor ambient noise levels resulting from project stationary sources would be less than significant.

Vibration

Construction-related vibration from future development in the vicinity of the project site would not be close enough to create a combined excessive generation of ground-borne vibration; therefore, cumulative impacts associated with excessive ground-borne vibration would be less than significant.

4.12.8 References

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SOURCE: Bing Maps (Accessed: 2025)

DUDEK

0 335 670 Feet

FIGURE 4.12-1

Project Location and Sound Monitoring Locations

Irvine Gateway Village Project EIR

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SOURCE: Esri Imagery

DUDEK

0 335 670 Feet

FIGURE 4.12-2

Traffic Noise Modeling Locations

Irvine Gateway Village Project EIR

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