3.14 NOISE AND VIBRATION

3.14.1 INTRODUCTION

This discussion provides an evaluation of K Line Northern Extension (KNE) as it relates to noise and vibration. It includes descriptions of the federal, state, and local regulatory setting, existing conditions, and the impacts from construction and operation of the proposed alignments and stations, design option, and maintenance and storage facility (MSF), as well as mitigation measures where applicable. For more detailed information, refer to the KNE Noise and Vibration Technical Report (Appendix 3.14-A).

3.14.2 REGULATORY FRAMEWORK

3.14.2.1 FEDERAL

Federal Transit Administration (FTA) standards and criteria for assessing noise and vibration impacts related to transit projects are used for this analysis since the California Environmental Quality Act (CEQA) does not address modeling methodology for transit noise and vibration impacts. The FTA methodology provided in the FTA Transit Noise and Vibration Impact Assessment Manual (FTA Guidance Manual; FTA 2018) is the proven method to address the effects of noise and vibration on the environment from transit construction and operations, and it is based on community reactions to noise. Section 3.14.3, Methodology, summarizes the FTA Guidance Manual approach applied to this project.

3.14.2.2 STATE

There are no state regulations applicable to the project regarding noise and vibration.

3.14.2.3 REGIONAL

There are no regional regulations applicable to the project regarding noise and vibration.

3.14.2.4 LOCAL

The City of Los Angeles has established policies and regulations concerning the generation and control of noise that could adversely affect its citizens and noise-sensitive land uses. The City of Los Angeles Municipal Code and the City of Los Angeles General Plan Noise Element (1999) are the two documents designed to regulate noise within the city. The LA CEQA Threshold Guide (City of Los Angeles 2006) provides impact thresholds for construction within the city (referred to herein as LA City CEQA thresholds).

The City of West Hollywood's Municipal Code Section 9.08 has established policies and regulations concerning the generation and control of noise that could adversely affect its citizens and noise-sensitive land uses.

Table 3.14-1 summarizes the relevant City of Los Angeles and City of West Hollywood ordinances.

TABLE 3.14-1. NOISE AND VIBRATION CODES, GOALS, OBJECTIVES, AND POLICIES

CODE/GOAL/OBJECTIVE/ POLICY	DESCRIPTION
CITY OF LOS ANGELES MUNICIPAL CODE	
Section 41.40	Engaging in construction, repair, or excavation work with any construction-type device or job-site delivering of construction materials without a Police Commission approved variance would constitute a violation: • Between the hours of 9:00 p.m. and 7:00 a.m. of the following day. • In any residential zone, or within 500 feet of land so occupied, before 8:00 a.m. or after 6:00 p.m. on any Saturday, or at any time on any Sunday. In a manner as to disturb the peace and quiet of neighboring residents or any reasonable person of normal sensitiveness residing in the area.
Section 41.40(j)	Noise standards do not apply to major public works construction by the City of Los Angeles and its proprietary departments, including all structures and operations necessary to regulate or direct traffic due to construction activities. The Board of Police Commissioners will grant a variance for this work and construction activities will be subject to all conditions of the variance as granted.
Section 91.1207.14.2	Interior noise levels attributable to exterior sources shall not exceed 45 dB in any habitable room.
Section 112.05	Any powered equipment or hand tool that produces a maximum noise level exceeding 75 dBA at a distance of 50 feet when operated within 500 feet of a residential zone is prohibited. This noise limitation does not apply where compliance is technically infeasible.
CITY OF LOS ANGELES GENERAL PLAN NOISE ELEMENT	
P11	For a proposed development project that is deemed to have a potentially significant noise impact on noise-sensitive uses require mitigation measures, as appropriate, in accordance with CEQA and city procedures.
P12	Discretionary permits for a proposed noise-sensitive use or a subdivision of four or more detached single-family units and which use is determined to be potentially significantly impacted by existing or proposed noise sources, require mitigation measures, as appropriate, in accordance with procedures set forth in the CEQA to achieve an interior noise level of a CNEL of 45 dB or less.
CITY OF LOS ANGELES CEQA THRESHOLD GUIDELINES	
I.2	A project would normally have a significant impact on noise levels from construction if: • Construction activities lasting more than one day would exceed existing ambient exterior noise levels by 10 dBA or more at a noise-sensitive use; • Construction activities lasting more than 10 days in a three-month period would exceed existing ambient exterior noise levels by 5 dBA or more at a noise-sensitive use; or • Construction activities would exceed the ambient noise level by 5 dBA at a noise-sensitive use between the hours of 9:00 p.m. and 7:00 a.m. Monday through Friday, before 8:00 a.m. or after 6:00 p.m. on Saturday, or at any time on Sunday.

CODE/GOAL/OBJECTIVE/ POLICY	DESCRIPTION
CITY OF WEST HOLLYWOOD MUNICIPAL CODE	
Section 9.08.050(d 1)	States construction between the hours of 7:00 p.m. and 8:00 a.m. on weekdays; or at any time on Saturday (except, between the hours of 8:00 a.m. and 7:00 p.m., interior construction is permissible); or at any time on Sunday or certain holidays.
Section 9.08.050(d 2)	To minimize the disturbance to surrounding community, the motors and engines for construction-related vehicles and equipment shall not be left idling and shall be turned off when not in use.
Section 9.08.0560(d)	The provisions of Section 9.08.050 do not apply to any person who performs construction, repair, earthmoving work, excavation, or commercial tree trimming and removal services if and to the extent that the City Manager has given prior written permission.

Source: City of Los Angeles Municipal Code; City of Los Angeles 1999, 2006; City of West Hollywood Municipal Code 2023
CEQA = California Environmental Quality Act; CNEL = community noise equivalent level; dB = decibels; dBA = A-weighted decibels; Ldn = day-night noise level

3.14.3 METHODOLOGY

3.14.3.1 CEQA METHODOLOGY

The purpose of this assessment is to evaluate the project against CEQA thresholds of significance as the basis for determining the level of impacts related to noise and vibration. The analysis uses the FTA Guidance Manual (FTA 2018) for assessing noise and vibration associated with construction and operation of transit projects. Impacts are analyzed in accordance with CEQA guidelines using the FTA noise and vibration impact criteria to identify significant increases in noise and vibration levels, as summarized below.

3.14.3.1.1 NOISE

FTA standards and criteria for assessing noise impacts related to construction and operation of transit projects are based on community reactions to noise. The criteria reflect changes in noise exposure using a sliding scale where the higher the level of existing noise, the smaller the increase in total noise exposure that is allowed. FTA noise impact criteria group sensitive land uses into three categories, as described in Table 3.14-2. Most commercial or industrial uses are not considered noise-sensitive because activities within these types of buildings are generally compatible with higher noise levels. Businesses can be considered noise-sensitive if low noise levels are an important part of their operations; such businesses include sound and motion picture recording studios. Most parks used primarily for active recreation, such as sports complexes and bike or running paths, are not considered noise-sensitive. However, some parks (even some in dense urban areas) are primarily used for passive recreation, such as reading, conversation, or meditation. These places, which may be valued as havens from the noise and rapid pace of everyday city life, are treated as noise-sensitive and are included in Land Use Category 3 below. Non-sensitive uses do not require noise impact assessment.

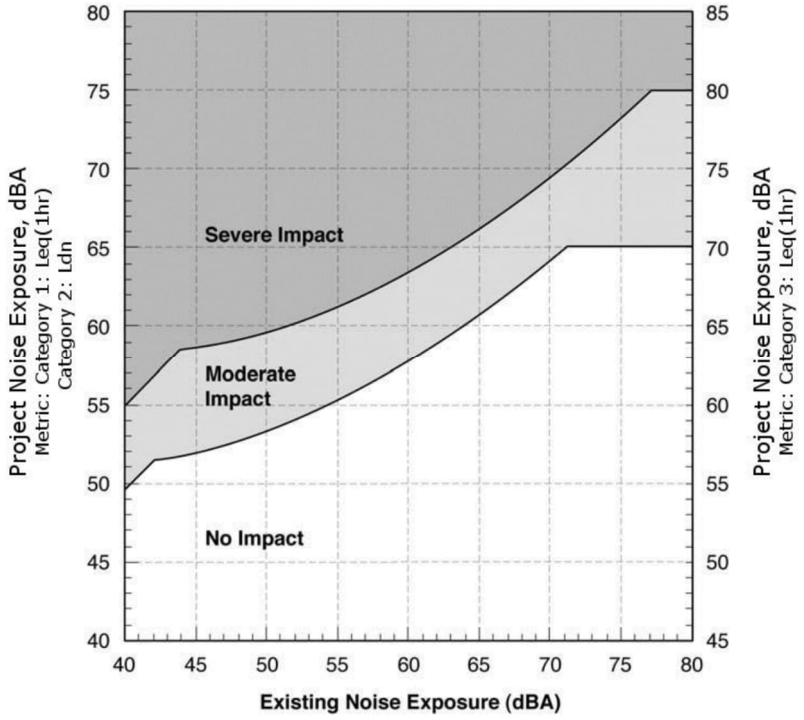
TABLE 3.14-2. LAND USE CATEGORIES AND METRICS FOR TRANSIT NOISE IMPACT CRITERIA

LAND USE CATEGORY	LAND USE TYPE	NOISE METRIC (dBA)	DESCRIPTION OF LAND USE CATEGORY
1	High Sensitivity	Outdoor L_{eq} (1hr)[1]	Land where quiet is an essential element of its intended purpose. Example land uses include preserved land for serenity and quiet, outdoor amphitheaters and concert pavilions, and national historic landmarks with considerable outdoor use. Recording studios and concert halls are also included in this category.
2	Residential	Outdoor L_{dn}	This category is applicable to all residential land use and to buildings where people normally sleep, such as hotels and hospitals.
3	Institutional	Outdoor L_{eq} (1hr)[1]	This category is applicable to institutional land uses with primarily daytime and evening use. Example land uses include schools, libraries, theaters, and churches where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, museums, campgrounds, and recreational facilities are also included in this category.

Source: FTA 2018
[1] L_{eq} (1hr) for the loudest hour of project-related activity during hours of noise sensitivity.
dBA = A-weighted decibels; L_{dn} = day-night noise level; L_{eq} = equivalent noise level

The FTA has defined three levels of impacts for sensitive uses affected by transit projects: no impact, moderate impact, and severe impact. Each impact level is illustrated in Figure 3.14-1 and described in Table 3.14-3.

FIGURE 3.14-1. NOISE IMPACT CRITERIA FOR TRANSIT PROJECTS



Source: FTA 2018

TABLE 3.14-3. LEVELS OF IMPACT

LEVEL OF IMPACT	DESCRIPTION
No Impact	Project-generated noise is not likely to cause community annoyance. Noise projections in this range are considered acceptable by FTA and mitigation is not required.
Moderate Impact	Project-generated noise in this range is considered to cause impact at the threshold of measurable annoyance. Moderate impacts serve as an alert to project planners for potential adverse impacts and complaints from the community. Mitigation should be considered at this level of impact based on project specifics and details concerning the affected properties.
Severe Impact	Project-generated noise in this range is likely to cause a high level of community annoyance. The project sponsor should first evaluate alternative locations/alignments to determine whether it is feasible to avoid severe impacts altogether. In densely populated urban areas, evaluation of alternative locations may reveal a trade-off of affected groups, particularly for surface rail alignments. Projects that are characterized as point sources rather than line sources often present greater opportunity for selecting alternative sites. This guidance manual and FTA's environmental impact regulations both encourage project sites that are compatible with surrounding development when possible. If it is not practical to avoid severe impacts by changing the location of the project, mitigation measures must be considered.

Source: FTA 2018

The FTA has identified special cases for moderate and severe impact categories:

- Moderate: In this range, other project-specific factors must be considered to determine the magnitude of the impact and the need for mitigation. These other factors may include the predicted increase over existing noise levels, the type and number of noise-sensitive land uses affected, existing outdoor-indoor sound insulation and the cost effectiveness of mitigating noise to more acceptable levels.
- Severe: Noise mitigation will be specified for severe impact areas unless there is no practical method of mitigating the noise.

For CEQA purposes, a severe impact under FTA guidelines is considered a significant impact for noise levels in this analysis. Mitigation measures will be identified for significant impacts under CEQA.

3.14.3.1.1.1 CONSTRUCTION NOISE

Construction noise was modeled using noise levels from the FTA Guidance Manual and the Federal Highway Administration (FHWA) Roadway Construction Noise Model version 1.1. For transit projects, FTA's construction noise assessment criteria are based upon a 1-hour equivalent noise level (L_{eq}). For residential uses, the threshold is 90 A-weighted decibels (dBA) for daytime construction and 80 dBA for nighttime construction. Commercial and industrial uses are held to a 100-dBA daytime and nighttime noise construction threshold. For the purposes of this analysis, the FTA general assessment construction noise limit criteria of 1-hour L_{eq} have been applied. While the FTA criteria were used for this general assessment, the 80-dBA nighttime threshold will likely not be used because Metro would defer to the noise ordinances of local jurisdictions.

The three types of construction that would occur are at-grade construction and tunnel construction, including cut-and-cover and sequential excavation method construction. Construction of the

aboveground elements of the guideways and MSF would use equipment such as heavy-earth moving equipment, generators, cranes, and pneumatic tools. Construction activity at station areas would be cut-and-cover. Construction noise levels at the staging areas would be less than the noise levels generated by at-grade construction and would primarily involve the movement of equipment.

The impact analysis described in Section 3.14.7 utilizes the FTA Guidance Manual for the general assessment construction noise criteria with transit projects. However, during construction, Metro would defer to local noise ordinances, where local noise ordinances exist (see Table 3.14-1). The FTA guidelines are considered reasonable criteria for impact assessment. If these criteria are exceeded, there may be adverse community reaction. Table 3.14-4 shows these noise criteria by land use. While the FTA criteria were used for this general assessment, the 80 dBA nighttime threshold will likely not be used in later stages of design because Metro would defer to noise ordinances of local jurisdictions.

TABLE 3.14-4. GENERAL ASSESSMENT OUTDOOR CONSTRUCTION NOISE CRITERIA

LAND USE	$L_{EQ,EQUIP(1HR)}$, dBA	
	DAY	NIGHT
Residential	90	80
Commercial	100	100
Industrial	100	100

Source: FTA 2018
dBA = A-weighted decibels; L_{eq} = hourly equivalent noise level

The FTA Guidance Manual includes noise levels for common pieces of construction equipment. For equipment not listed in the FTA Guidance Manual, noise levels from the FHWA Roadway Construction Noise Model were used. Construction noise levels were assessed as they would typically occur during at-grade, tunnel, and cut-and-cover construction. The two loudest pieces of construction equipment used for each of these construction types were combined, and this noise level was used to assess construction noise against the FTA construction 1-hour L_{eq} noise criteria.

The City of Los Angeles has established quantitative standards for construction noise, as shown in Table 3.14-5. The City of West Hollywood has set construction hours between 8 a.m. and 7 p.m.; during these times, construction is exempt from local noise standards. As noted above, for the purposes of this analysis, the FTA general assessment construction noise limit criteria of 1-hour L_{eq} have been applied.

TABLE 3.14-5. CONSTRUCTION STANDARDS BY JURISDICTION

JURISDICTION	PERMISSIBLE CONSTRUCTION TIME	QUANTITATIVE CONSTRUCTION NOISE STANDARD
City of Los Angeles	7:00 a.m. to 9:00 p.m. Monday through Friday 8:00 a.m. to 6:00 p.m. Saturdays	75 dBA at 50 feet within 500 feet of a residential zone
City of West Hollywood	8:00 a.m. to 7:00 p.m. Monday through Saturday	None Stated

Sources: City of Los Angeles *Municipal Code*; City of Los Angeles 1999; City of West Hollywood Municipal Code 2023

3.14.3.1.1.2 OPERATIONAL NOISE

An analysis of operational noise levels at sensitive land uses was completed using the FTA Detailed Noise Analysis procedure as found in Section 4.5 of the FTA Guidance Manual.

The project would be primarily underground, with the exception of the MSF and the entrances and exits to the stations. The following sections provide methodological considerations about surface project components.

STATION NOISE

Aboveground noise-generating activities include entrance and egress from the stations (through stairways, escalators, and elevators), as well as an increase in the number of people around the station. The openings for the escalators and for the ventilation shafts can act as noise sources for the subway. Emergency egress locations would be closed during normal operations and would not be a source of noise. Noise related to underground operational activities at the stations, as with noise in the tunnels, would not reach the surface and was therefore not included in the noise analysis.

MAINTENANCE AND STORAGE FACILITY NOISE

Aboveground noise sources within the MSF would include the following:

- Train movement on tracks: Train movements at the MSF would generate noise from steel wheels rolling on steel rails. Trains would travel at low speeds within the MSF site (an average speed of 10 miles per hour within the yard and five miles per hour along curves).
- Crossovers: Turnouts and crossovers require that two rails cross. The wheels striking the ends of the gap increases noise and vibration levels near special trackwork by approximately 5 dBA.
- Wheel squeal: The MSF would include tight curves that may generate wheel squeal that would add 10 dBA.
- Maintenance shops: A reference noise level for the maintenance shops was obtained from the Metro E Line Phase 2 Final Environmental Impact Report (Metro 2022) and from noise measurements at the Metro C Line Maintenance Yard. The reference noise level was 62 dBA L_{eq} at 30 feet for a period of 30 minutes. The noise level from the maintenance shops is assumed to be continuous.
- Car wash: A reference sound exposure level of 85 dBA (maximum noise levels of 64 dBA) at 20 feet was used based on measurements taken for other recent Metro studies, such as the Metro E Line Phase 2 Project (Metro 2022).
- Vehicular traffic: To increase the traffic noise levels along a roadway by 3 dBA, the amount of traffic would need to double. Employee trips to and from the MSF would constitute a small portion of the overall traffic along the roadway network and would not double traffic volumes along any roadway. Therefore, employee trips would not result in a substantial permanent increase in noise levels near the MSF and employee trips were not further assessed in this analysis.

- Traction power substations: Reduction of noise from traction power substations would be provided by barriers, enclosures, sound-absorptive materials, and engine silencers as applicable. Operation of the generators would not be a part of regular operation and would only be used during emergency situations and during weekly testing for approximately 20 minutes. Noise from generators would be reduced by barriers, enclosures, sound-absorptive materials, and engine silencers as applicable. Therefore, generator operation has not been included as part of the operational analysis.

Noise levels from MSF noise sources were combined to assess impacts at receivers.

3.14.3.1.2 VIBRATION

FTA has developed impact criteria for acceptable levels of ground-borne vibration (GBV) and ground-borne noise (GBN). GBV is the movement of the ground caused by an energy source, such as construction activities or light rail vehicle movement; GBN is the noise that can occur inside a building, caused by the effect of GBV on the structure of the building. These criteria, as summarized in Table 3.14-6, are presented in terms of acceptable indoor GBN and GBV levels. Impacts will occur if these levels are exceeded. Criteria for GBV are expressed in terms of root mean square velocity levels in vibration decibels (VdB), and criteria for GBN are expressed in terms of A-weighted sound pressure levels in dBA.

TABLE 3.14-6. GBV AND GBN IMPACT CRITERIA FOR GENERAL ASSESSMENT

LAND USE CATEGORY	GBV IMPACT LEVELS (VdB, 1 MICRO-INCH/SEC) – FREQUENT EVENTS	GBN IMPACT LEVELS (dBA, 20 MICRO PASCALS) – FREQUENT EVENTS
Category 1: Buildings where vibration would interfere with interior operations[1]	65	N/A
Category 2: Residences and buildings where people normally sleep	72	35
Category 3: Institutional land uses with primarily daytime use	75	40

Source: FTA 2018
[1] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment, such as optical microscopes.
Note: Since the project would have more than 70 light rail vehicle pass-bys per day, the FTA criteria for frequent events is used to assess potential impacts.
dBA = A-weighted decibels; GBN = ground-borne noise; GBV = ground-borne vibration; N/A = not applicable; VdB = vibration decibels

The criteria for special buildings such as concert halls, television and recording studios, auditoriums, and theaters, which are also sensitive to vibration but do not fit into the three FTA sensitive land use categories previously described, are presented in Table 3.14-7. For this project, the Hollywood Bowl, Lee Strasberg Theatre, and others are included in this special building category. The Academy Museum is classified as a Category 3 institutional land use due to its usage as a movie theater. Medical buildings may have equipment sensitive to vibration and may need to be evaluated if there is a possibility of a vibration impact at the building.

Findings of a severe impact according to FTA criteria is considered a significant impact for the purposes of this CEQA analysis. Mitigation measures will be identified for severe impacts. Table 3.14-7 also considers the frequency of vibration events.

TABLE 3.14-7. GBV AND GBN IMPACT CRITERIA FOR SPECIAL BUILDINGS

TYPE OF BUILDING OR ROOM	GBV IMPACT LEVELS (VdB, 1 MICRO-INCH/SEC) – FREQUENT EVENTS	GBN IMPACT LEVELS (dBA, 20 MICRO PASCALS) – FREQUENT EVENTS
Concert Halls	65	25
TV Studios	65	25
Recording Studios	65	25
Auditoriums	72	30
Theaters	72	35

Source: FTA 2018
Note: Since the project would have more than 70 light rail vehicle pass-bys per day, the FTA criteria for frequent events is used to assess potential impacts.
dBA = A-weighted decibels; GBN = ground-borne noise; GBV = ground-borne vibration; VdB= vibration decibels

3.14.3.1.2.1 CONSTRUCTION VIBRATION

Construction vibration was modeled using vibration levels from the FTA Guidance Manual, which includes vibration levels for common pieces of construction equipment. To evaluate potential annoyance or interference with vibration-sensitive activities caused by construction vibration, the criteria for general assessment shown in Table 3.14-6 above can be applied. In most cases, the primary concern regarding construction vibration relates to potential damage effects. Using the values in Table 3.14-8, a general assessment of the distance of the damage risk for different types of buildings was calculated.

TABLE 3.14-8. CONSTRUCTION VIBRATION

EQUIPMENT	PPV AT 25 FEET (INCH/SECOND)	APPROXIMATE L_V AT 25 FEET
Clam shovel drop (slurry wall)	0.202	94
Hydromill (slurry wall) in soil	0.0008	66
Hydromill (slurry wall) in rock	0.017	75
Vibratory roller	0.21	94
Hoe ram	0.089	87
Large bulldozer	0.089	87
Caisson drilling	0.089	87
Load trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

Source: FTA 2018
PPV = peak particle velocity; L_v = velocity level

3.14.3.1.2.2 OPERATIONAL VIBRATION

An analysis of operational GBV levels at sensitive receivers was completed using the FTA Detailed Vibration Analysis procedure, as outlined below:

- Receivers of Interest: Identify clusters of sensitive receivers and select closest receiver to underground project alignment and at-grade maintenance and ancillary facilities.
- Vibration Impact Assessment: Assess the GBV impact at each receiver of interest using the impact criteria defined in Table 3.14-6 and Table 3.14-7.
- Mitigation of Vibration Impact: Where the assessment shows an exceedance of the FTA vibration impact thresholds, evaluate mitigation measures and/or design modifications to the track design. Then loop back to modify the project vibration computations, thereby accounting for the adopted mitigation, and reassess the remaining vibration impact.

Since the alignments and the design option are primarily underground, the potential impacts from train operations would be related to GBV and GBN. The modeling of GBV and GBN was conducted in accordance with the FTA Detailed Vibration Analysis procedure. GBN from operation of the alignments and stations was modeled because the alignments would be below ground; GBN from MSF operations was not modeled because it would not be underground. Vibration from a passing train in a tunnel has a relatively small potential to move through the geologic strata and result in building vibration from energy transferred through a building's foundation. Vibration levels that would be high enough to cause any building damage, even minor cosmetic damage, are extremely unlikely.

GBV is analyzed because of its potential to create an annoyance, or to cause issues for sensitive equipment, such as a magnetic resonance imaging scanners, as well as its potential to damage buildings:

- Human Annoyance from Vibration: Potential human annoyance from vibration is assessed using root mean square (RMS) vibration velocity. GBV from transit vehicles is characterized using RMS vibration velocity amplitude expressed as VdB. The vibration perception threshold for most humans is approximately an RMS vibration level of 65 to 70 VdB. Levels from 70 to 75 VdB are typically noticeable but acceptable to most persons. Levels higher than 80 VdB are often considered unacceptable.
- Sensitive Equipment Issues with Vibration: Potential issues with sensitive equipment from vibration is assessed using RMS vibration velocity. GBV from transit vehicles is characterized using RMS vibration velocity amplitude expressed as VdB. The vibration perception threshold for buildings where vibration would interfere with interior operations and potentially with equipment is an RMS vibration level of 65 VdB for screening level or the specific criteria of the equipment manufacturer.

In contrast, GBN is a low-frequency rumble related to GBV that excites a building's floors and walls. A deep subway produces no appreciable airborne noise above the ground surface. The GBN is considered to be related to operational vibration, and the GBN may be slightly audible within a building that otherwise has low internal background noise. Because GBN is directly related to GBV, the level of GBN is a function of the distance from the tracks to the building. To calculate the GBN, the GBV is first calculated, and then the potential for exciting GBN is determined. Both the FTA GBV and GBN impact criteria are

shown in Table 3.14-6. The GBN and GBV analysis uses vibration impact thresholds defined in the FTA Guidance Manual. Residences are considered FTA Category 2 receivers in the FTA guidance. The thresholds for Category 2 receivers are 72 VdB for GBV and 35 dBA for GBN.

3.14.3.2 SIGNIFICANCE THRESHOLDS

In accordance with Appendix G of the 2022 CEQA Guidelines, the project would have a significant impact related to noise and vibration if it would:

- Impact NOI-1: Result in the 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 ordinances, or applicable standards of other agencies.
- Impact NOI-2: Result in generation of excessive GBV or GBN levels.
- Impact NOI-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, expose people residing or working in the project area to excessive noise levels.

3.14.4 RESOURCE STUDY AREA

3.14.4.1 NOISE

The resource study area (RSA) for noise impacts is defined as a radius of 200 feet from all alignments and stations, the design option, and the MSF. A radius of 200 feet was chosen because it is the FTA limit for noise screening for this type of project within an urban environment. Due to buildings in the area, the noise sources would not have an effect over 200 feet away.

3.14.4.2 VIBRATION

The RSA for vibration impacts is defined as a radius of 100 feet from each alignment and stations, the design option, and the MSF. A screening distance of 100 feet horizontal from the center line of the alignment at the surface was used to further identify land uses that could have issues with vibration. These land uses were then screened to only include areas where the depth to the rail tunnel is 110 feet or less. This value takes into consideration a buffer of 10 feet to account for any uncertainty in potential vibration transmission through the ground.

3.14.5 EXISTING SETTING

This existing setting discussion summarizes current conditions related to noise and vibration within the KNE RSA.

3.14.5.1 NOISE

3.14.5.1.1 REGIONAL SETTING

KNE is located in the Cities of Los Angeles and West Hollywood in Los Angeles County. The existing noise environment is primarily an urban area that typically has day-night noise levels (L_{dn}) between 65 and 71 L_{dn} dBA. KNE would be in a below-ground transit alignment that would operate in underground tunnels. GBN from construction and operations would transmit as GBV through the ground to the buildings above and adjacent to the tunnel alignment. At-grade facilities such as station entrances and ventilation structures, are a potential source of noise.

The exterior noise environment within an urban area is generally dominated by traffic noise and occasional aircraft flyovers that are contributors to the existing noise environment. Land uses found around the station locations include public facilities, public and commercial office buildings, various types of commercial uses, institutional uses, multifamily residential uses (including adaptive reuse of older non-residential buildings), industrial uses, surface parking facilities, and parking structures.

3.14.5.1.1.1 ALIGNMENTS AND STATIONS

Land uses were evaluated within a screening distance of 200 feet from each station for all three alignments. Table 3.14-9 through Table 3.14-11 show the stations for each alignment with noise-sensitive land uses within the RSA. For the KNE San Vicente–Fairfax Alignment there are ten noise-sensitive parcels; for the KNE Fairfax Alignment there are seven noise-sensitive parcels; and for the KNE La Brea Alignment there are 15 noise-sensitive parcels within each RSA. Figure 3.14-2 shows the locations of the noise measurement locations and noise-sensitive land uses identified in the RSA.

FIGURE 3.14-2. NOISE MEASUREMENT AND NOISE-SENSITIVE LAND USES WITHIN KNE RESOURCE STUDY AREA

Source: Connect Los Angeles Partners 2024

KNE SAN VICENTE–FAIRFAX ALIGNMENT

Ten noise-sensitive parcels are located within the station RSAs along the KNE San Vicente–Fairfax Alignment. Table 3.14-9 identifies these noise-sensitive land uses.

TABLE 3.14-9. NOISE-SENSITIVE LAND USES WITHIN KNE SAN VICENTE–FAIRFAX ALIGNMENT STATION RESOURCE STUDY AREAS

STATION (NOISE MEASUREMENT LOCATION)	NOISE-SENSITIVE LAND USE	# OF PARCELS	# OF RESIDENTIAL UNITS	EXISTING L_{dn} dBA AND PEAK HOUR L_{eq} dBA LEVELS AT NOISE-SENSITIVE LAND USES[1]
Expo/Crenshaw	None	None	0	N/A
Crenshaw/Adams (LT1, ST1)	Residential – SFR	2 – SFR	2	L_{dn} 67 dBA/peak hour L_{eq} 65 dBA at 3 p.m. – 2614 S Victoria Ave
Midtown Crossing (LT2)	Residential – MFR (Apartment Building)	1 – MFR	20	L_{dn} 62 dBA/peak hour L_{eq} 73 dBA at 3 p.m. – 4729 San Vicente Blvd
Wilshire/Fairfax (LT6)	Residential – MFR (Apartment Building) Academy Museum of Motion Pictures	1 – MFR 1 – Mixed-Use Building 1 – Museum	24	L_{dn} 61 dBA/peak hour L_{eq} 68 dBA at 10 a.m. – 6122 Orange St/Academy Museum of Motion Pictures
Fairfax/3rd	None	None	0	N/A
La Cienega/Beverly (LT7)	Residential – MFR (Apartment Building)	1 – Duplex	2	L_{dn} 63 dBA/peak hour L_{eq} 64 dBA at 8 a.m. – 321 N Alfred St
San Vicente/Santa Monica (LT8)	Residential – MFR (Apartment Building)	2 – Apartment Complexes	42	L_{dn} 63 dBA/peak hour L_{eq} 65 dBA at 5 p.m. – 840 Larrabee St
Fairfax/Santa Monica	None	None	0	N/A
La Brea/Santa Monica (LT5)	Residential – The Dylan Apartments	1 – Apartment Complex	70	L_{dn} 74 dBA/peak hour L_{eq} 73 dBA at 12 a.m. – 7100 Santa Monica Blvd
Hollywood/Highland	None	None	0	N/A

Source: Connect Los Angeles Partners 2024
[1] L_{dn} dBA applies to FTA Category 2 residential receivers and peak hour L_{eq} dBA applies to Category 3 institutional receivers.
dBA = A-weighted decibels; L_{eq} = equivalent noise level; L_{dn} = day-night noise level; N/A = not applicable; RSA = resource study area; SFR = single-family residence; MFR = multifamily residence

In addition, a staging area to support construction activities at the Fairfax/3rd Station would be located approximately 50 feet from the northern property line of Hancock Park Elementary School (408 S Fairfax Avenue), where there is an estimated existing L_{dn} of 62 dBA and a peak hour L_{eq} 28 dBA at 3 p.m. Hancock Park Elementary School would be more than 250 feet from proposed at-grade, cut-and-cover, and tunnel construction activities.

KNE FAIRFAX ALIGNMENT

Seven noise-sensitive parcels are located within the station RSAs along the KNE Fairfax Alignment. Table 3.14-10 identifies these noise-sensitive land uses.

TABLE 3.14-10. NOISE-SENSITIVE LAND USES WITHIN KNE FAIRFAX ALIGNMENT STATION RESOURCE STUDY AREAS

STATION (NOISE MEASUREMENT LOCATION)	NOISE-SENSITIVE LAND USE	# OF PARCELS	# OF RESIDENTIAL UNITS	EXISTING L_{dn} dBA AND PEAK HOUR L_{eq} dBA LEVELS AT NOISE-SENSITIVE LAND USES[1]
Expo/Crenshaw	None	None	0	N/A
Crenshaw/Adams (LT1, ST1)	Residential – SFR	2 – SFR	2	L_{dn} 67 dBA/peak hour L_{eq} 65 dBA at 3 p.m. – 2614 S Victoria Ave
Midtown Crossing (LT2)	Residential – MFR (Apartment Building)	1 – MFR	20	L_{dn} 62 dBA/peak hour L_{eq} 73 dBA at 3 p.m. – 4729 San Vicente Blvd
Wilshire/Fairfax (LT6)	Residential – MFR Academy Museum of Motion Pictures	1 – MFR 1 – Mixed-Use Building 1 – Museum	24	L_{dn} 61 dBA/peak hour L_{eq} 68 dBA at 10 a.m. – 6122 Orange St/ Museum
Fairfax/3rd	None	None	0	N/A
Fairfax/Santa Monica	None	None	0	N/A
La Brea/Santa Monica (LT5)	Residential – MFR (The Dylan Apartments)	1 – MFR	70	L_{dn} 74 dBA/peak hour L_{eq} 73 dBA at 12 a.m. – 7100 Santa Monica Blvd
Hollywood/Highland	None	None	0	N/A

Source: Connect Los Angeles Partners 2024
[1] L_{dn} dBA applies to FTA Category 2 residential receivers and peak hour L_{eq} dBA applies to Category 3 institutional receivers.
dBA = A-weighted decibels; L_{eq} = equivalent noise level; L_{dn} = day-night noise level; N/A = not applicable; RSA = resource study area; SFR = single-family residence; MFR = multifamily residence

In addition, a staging area to support construction activities at the Fairfax/3rd Station would be located approximately 50 feet from the northern property line of Hancock Park Elementary School (408 S Fairfax Avenue), where there is an estimated existing L_{dn} of 62 dBA and a peak hour L_{eq} of 28 dBA at 3 p.m. Hancock Park Elementary School would be more than 250 feet from proposed at-grade, cut-and-cover, and tunnel construction activities.

KNE LA BREA ALIGNMENT

Fifteen noise-sensitive parcels are located within the station RSAs along the KNE La Brea Alignment. Table 3.14-11 identifies these noise-sensitive land uses.

TABLE 3.14-11. NOISE-SENSITIVE LAND USES WITHIN KNE LA BREA ALIGNMENT STATION RESOURCE STUDY AREAS

STATION (NOISE MEASUREMENT LOCATION)	NOISE-SENSITIVE LAND USE	# OF PARCELS	# OF RESIDENTIAL UNITS	EXISTING L_{dn} dBA AND PEAK HOUR L_{eq} dBA LEVELS AT NOISE-SENSITIVE LAND USES[1]
Expo/Crenshaw	None	None	0	N/A
Crenshaw/Adams (LT1, ST1)	Residential – SFR	2 – SFR	2	L_{dn} 67 dBA/peak hour L_{eq} 65 dBA at 3 p.m. – 2614 S Victoria Ave
Midtown Crossing (LT2)	Residential – Apartments	1 – Apartment Complex	20	L_{dn} 62 dBA/peak hour L_{eq} 73 dBA at 3 p.m. – 4729 San Vicente Blvd
Wilshire/La Brea (LT3, ST2)	Residential – SFR and Apartments	3 – SFR 3 – Apartment Complexes	64	L_{dn} 71 dBA/peak hour L_{eq} 71 dBA at 12 a.m. – 618 S Detroit St
La Brea/Beverly (LT4, ST3)	Residential – SFR and Apartments	4 – SFR 1 – Apartment Complex	6	L_{dn} 68 dBA/peak hour L_{eq} 69 dBA at 2 p.m. – 317 N Detroit St
La Brea/Santa Monica (LT5)	Residential – The Dylan Apartments	1 – Apartment Complex	70	L_{dn} 74 dBA/peak hour L_{eq} 73 dBA at 12 a.m. – 7100 Santa Monica Blvd
Hollywood/Highland	None	None	0	N/A

Source: Connect Los Angeles Partners 2024
[1] L_{dn} dBA applies to FTA Category 2 residential receivers and peak hour L_{eq} dBA applies to Category 3 institutional receivers.
dBA = A-weighted decibels; L_{eq} = equivalent noise level; L_{dn} = day-night noise level; N/A = not applicable; RSA = resource study area; SFR = single-family residence

3.14.5.1.1.2 HOLLYWOOD BOWL DESIGN OPTION

The Hollywood Bowl Design Option would be located primarily underground, with the aboveground station entrance at the Hollywood Bowl. This station would be located under an existing parking lot. The performance area for the Hollywood Bowl is more than 200 feet from any station activity and is shielded by buildings and natural terrain. There are no noise-sensitive parcels or land uses within the RSA for the Hollywood Bowl Station.

3.14.5.1.1.3 MAINTENANCE AND STORAGE FACILITY

No noise-sensitive land uses are located within the RSA of the MSF. According to the Final Los Angeles International Airport (LAX) Part 150 Noise Exposure Map Update Report, the MSF would be located inside the airport's 65 to 70 community noise equivalent level contour, the time-weighted 24 hour average noise level for a location (Los Angeles World Airports 2015). The MSF would be located in an area within an acceptable range of noise exposure given the existing industrial land uses. Aircraft are the only source of noise from LAX in the MSF RSA, but noise from roadways and industrial land use adds to the overall noise levels. No flight paths cross the MSF site.

3.14.5.2 VIBRATION

3.14.5.2.1 REGIONAL SETTING

The KNE RSA is located in the Cities of Los Angeles and West Hollywood in Los Angeles County. The existing urban environment in this region is dominated by auto-oriented corridors, which are used frequently by automobiles, buses, and trucks. Although no vibration measurements were conducted to assess existing ambient vibration levels, vibration propagation test results from Metro's Westside Purple Line Extension project (Metro 2012) were used to determine how vibration would propagate from the tracks to GBV- and GBN-sensitive receivers.

3.14.5.2.1.1 ALIGNMENTS AND STATIONS

KNE SAN VICENTE–FAIRFAX ALIGNMENT

As shown in Figure 3.14-3, the KNE San Vicente–Fairfax Alignment has multiple areas with a tunnel depth of 110 feet or less, located between the following cross streets:

- Crenshaw Boulevard between Exposition Boulevard and I-10
- San Vicente Boulevard between Venice Boulevard and Orange Drive
- Where the tunnel passes under private properties near Olympic Boulevard and S Spaulding Avenue; S Genesee Avenue between Olympic Boulevard and 8th Street; S Ogden Drive between Olympic Boulevard and 8th Street; and S Orange Grove Avenue between 8th Street and Wilshire Boulevard
- S Fairfax Avenue between Wilshire Boulevard and 1st Street
- Beverly Boulevard between N Hayworth Avenue and N San Vicente Boulevard
- N Sherbourne Drive between N San Vicente Boulevard and Ashcroft Avenue
- N San Vicente Boulevard between Ashcroft Avenue and Santa Monica Boulevard
- Santa Monica Boulevard between N San Vicente Boulevard and N Orange Drive
- Where the tunnel passes under private properties near N Orange Drive and Santa Monica Boulevard; N Mansfield Avenue between Santa Monica Boulevard and Lexington Avenue; N Citrus Avenue between Santa Monica Boulevard and Lexington Avenue; and between Lexington Avenue and Highland Avenue
- Highland Avenue between Lexington Avenue and Hollywood Boulevard

FIGURE 3.14-3. VIBRATION-SENSITIVE LAND USES WITHIN KNE RESOURCE STUDY AREA

Source: Connect Los Angeles Partners 2024

Within these areas of the RSA, there are 151 vibration-sensitive land uses, as summarized in Table 3.14-12 and Figure 3.14-3.

TABLE 3.14-12. VIBRATION-SENSITIVE LAND USES WITHIN KNE SAN VICENTE–FAIRFAX ALIGNMENT RESOURCE STUDY AREA

LAND USE	# OF PARCELS	PARCEL USE/ADDRESS
Education[1]	7	• 5611 San Vicente Blvd • 567 S Fairfax Ave • 7951 Beverly Blvd • 1622 N Highland Ave • 7070, 7362, and 7924 Santa Monica Blvd
Residential	124	• 41 – SFR • 10 – Multi-Unit • 73 – Apartment Buildings
Art Gallery	0	• N/A
Worship Center	2	• West Angeles Church of God – 2 locations at 3602 and 3045 Crenshaw Blvd
Medical	5	• Complete Eye Care Center – 2825 Crenshaw Blvd • Olympia Hospital – 5901 W Olympic Blvd • Cedars-Sinai – 8700 Beverly Blvd • Modern Animal Hospital – 8126 Beverly Blvd • Hollywood Cat and Dog Hospital –1150 N La Brea Ave
School	5	• Hancock Park Elementary – 408 S Fairfax Ave • West Angeles Christian Academy – 3000 and 3004 Crenshaw Blvd • Hollywood Schoolhouse – 1248 N Highland Ave • Beverly Hills Children's Academy – 1105 N Laurel Ave
Museum	2	• Academy Museum of Motion Pictures – 6067 Wilshire Blvd • Peterson Automotive Museum – 6060 Wilshire Blvd
Theater	3	• Hollywood High School Theater – 1521 N Highland Ave[2] • West Angeles Performing Arts – 3020 Crenshaw Blvd • Lee Strasberg Theatre – 7936 Santa Monica Blvd
Hotel	3	• Ramada Plaza – 8585 Santa Monica Blvd • Short Story Hotel – 15 S Fairfax Ave • Sofitel Los Angeles at Beverley Hills – 8555 Beverly Blvd

Source: Connect Los Angeles Partners 2023
[1] The "education" category indicates an unspecified community or other educational land use.
[2] The Hollywood High School Theater was used to model vibration levels for other Hollywood High School buildings because it is closest to the proposed alignment.
N/A = not applicable; RSA = resource study area; SFR = single-family residence

KNE FAIRFAX ALIGNMENT

As shown in Figure 3.14-2 the Fairfax Alignment has seven areas with a tunnel depth of 110 feet or less, located between the following cross streets:

- Crenshaw Boulevard between Exposition Boulevard and I-10
- San Vicente Boulevard between Venice Boulevard and Orange Drive
- Where the tunnel passes under private properties near Olympic Boulevard and S Spaulding Avenue; S Genesee Avenue between Olympic Boulevard and 8th Street; S Ogden Drive between Olympic Boulevard and 8th Street; and S Orange Grove Avenue between 8th Street and Wilshire Boulevard
- S Fairfax Avenue between Wilshire Boulevard and 1st Street; N Fairfax Avenue between 1st Street and Melrose Avenue
- Where the tunnel passes under private properties near Waring Avenue and Fairfax Avenue; N Hayworth Avenue between Willoughby Avenue and Waring Avenue; Romaine Street between N Laurel Avenue and N Edinburgh Avenue; N Edinburgh Avenue between Romaine Street and Santa Monica Boulevard and between N Hayworth Avenue and Santa Monica Boulevard
- Where the tunnel passes under private properties near N Orange Drive and Santa Monica Boulevard; N Mansfield Avenue between Santa Monica Boulevard and Lexington Avenue; N Citrus Avenue between Santa Monica Boulevard and Lexington Avenue and between Lexington Avenue and Highland Avenue
- Highland Avenue between Lexington Avenue and Hollywood Boulevard

Within these four areas of the RSA, there are 185 vibration-sensitive land uses, as summarized in Table 3.14-13 and Figure 3.14-3.

TABLE 3.14-13. VIBRATION-SENSITIVE LAND USES WITHIN KNE FAIRFAX ALIGNMENT RESOURCE STUDY AREA

LAND USE	# OF PARCELS	PARCEL USE/ADDRESS
Education[1]	7	• 5611 San Vicente Blvd • 567 S Fairfax Ave • 1622 N Highland Ave • 1900 Hillcrest Rd • 7070, 7362, and 7924 Santa Monica Blvd
Residential	160	• 60 – SFR • 10 – Multi-Unit • 90 – Apartment Buildings
Art Gallery	0	• N/A
Worship Center	2	• West Angeles Church of God – 2 locations at 3602 and 3045 Crenshaw Blvd
Medical	3	• Complete Eye Care Center – 2825 Crenshaw Blvd • Olympia Hospital – 5901 W Olympic Blvd • Hollywood Cat and Dog Hospital –1150 N La Brea Ave

LAND USE	# OF PARCELS	PARCEL USE/ADDRESS
School	7	• Laurel Span School – 925 N Hayworth Ave • Hancock Park Elementary – 408 S Fairfax Ave • West Angeles Christian Academy – 3000 and 3004 Crenshaw Blvd • Hollywood Schoolhouse – 1248 N Highland Ave • Fairfax High School – 7850 Melrose Ave • Beverly Hills Children's Academy – 1105 N Laurel Ave
Museum	2	• Academy Museum of Motion Pictures – 6067 Wilshire Blvd • Peterson Automotive Museum – 6060 Wilshire Blvd
Theater	3	• West Angeles Performing Arts – 3020 Crenshaw Blvd • Hollywood High School Theater – 1521 N Highland Ave[2] • Lee Strasberg Theatre – 7936 Santa Monica Blvd
Hotel	1	• Short Story Hotel – 15 S Fairfax Ave

Source: Connect Los Angeles Partners 2023
[1] The "education" category indicates an unspecified community or other educational land use.
[2] The Hollywood High School Theater was used to model vibration levels for other Hollywood High School buildings because it is closest to the proposed alignment.
N/A = not applicable; RSA = resource study area; SFR = single-family residence

KNE LA BREA ALIGNMENT

As shown in Figure 3.14-3, the KNE La Brea Alignment has six areas with a tunnel depth of 110 feet or less, located between the following cross streets:

- Crenshaw Boulevard between Exposition Boulevard and I-10
- San Vicente Boulevard between Venice Boulevard and S Orange Drive
- S La Brea Avenue between Olympic Boulevard and W 6th Street
- S La Brea Avenue between 2nd Street and 1st Street; N La Brea Avenue between 1st Street and Lexington Avenue
- Where the tunnel passes under private properties near Lexington Avenue and N La Brea Avenue; Fountain Avenue and N Sycamore Avenue; N Orange Drive between Fountain Avenue and De Longpre Avenue; N Mansfield Avenue between Fountain Avenue and De Longpre Avenue; N Citrus Avenue between Fountain Avenue and De Longpre Avenue; De Longpre Avenue between N Mansfield Avenue and Highland Avenue; and between Leland Way and Highland Avenue
- Highland Avenue between Leland Way to Hollywood Boulevard

Within these three areas of the RSA, there are 86 vibration-sensitive land uses, as summarized in Table 3.14-14 and Figure 3.14-3.

TABLE 3.14-14. VIBRATION-SENSITIVE LAND USES WITHIN KNE LA BREA ALIGNMENT RESOURCE STUDY AREA

LAND USE	# OF PARCELS	PARCEL USE/ADDRESS
Education[1]	11	• 132, 330, 514, 516, 520, 524, 528, and 534 N La Brea Ave • 734 S La Brea Ave • 1622 N Highland Ave • 7070 Santa Monica Blvd
Residential	59	• 1 – SFR • 20 – Multi-Unit • 38 – Apartment Buildings
Art Gallery	1	• The Hole – 844 N La Brea Ave
Worship Center	3	• West Angeles Church of God – 2 locations at 3602 and 3045 Crenshaw Blvd • Congregation Levi Yitzhok – 356 N La Brea Ave
Medical	4	• Complete Eye Care Center – 2825 Crenshaw Blvd • The Rehabilitation Center – 501 N La Brea Ave • UCLA Health MPTF – 335 N La Brea Ave • Hollywood Cat and Dog Hospital –1150 N La Brea Ave
School	6	• West Angeles Christian Academy – 3000 and 3004 Crenshaw Blvd • Hollywood Schoolhouse – 1248 N Highland Ave • Bnos Esther – 116 N La Brea Ave • Yeshiva Rav Isacsohn – 540 and 555 N La Brea Ave
Museum	0	• N/A
Theater	2	• Hollywood High School Theater – 1521 N Highland Ave[2] • West Angeles Performing Arts – 3020 Crenshaw Blvd
Hotel	0	• N/A

Source: Connect Los Angeles Partners 2023
[1] The "education" category indicates an unspecified community or other educational land use.
[2] The Hollywood High School Theater was used to model vibration levels for other Hollywood High School buildings because it is closest to the proposed alignment.
N/A = not applicable; RSA = resource study area; SFR = single-family residence

3.14.5.2.1.2 HOLLYWOOD BOWL DESIGN OPTION

As shown in Figure 3.14-3, the Hollywood Bowl Design Option has one area with a tunnel depth of 110 feet or less, located between Highland Avenue between Franklin Road and Milner Road. Within this area of the RSA, there are four vibration-sensitive land uses: three hotels and one apartment complex.

3.14.5.2.1.3 MAINTENANCE AND STORAGE FACILITY

No vibration-sensitive land uses are located within the RSA for the MSF.

3.14.6 PROJECT MEASURES

Project measures are design features, best management practices, or other commitments that Metro would implement as part of all proposed alignments and stations, the design option, and the MSF to reduce or avoid environmental effects associated with project construction and operation. Project measures are not the same as mitigation measures, which are used to reduce an environmental impact's significance level. Where applicable, project measures are also discussed in Section 3.14.7 as part of the evaluation of environmental impacts.

3.14.6.1 PM NOI-1: GUIDELINES TO PROTECT CATEGORY 1 AND CATEGORY 3 LAND USES, HISTORIC BUILDINGS AND HISTORIC NON-BUILDING STRUCTURES DURING CONSTRUCTION

The general guidelines to protect Category 1 and Category 3 land uses, historic buildings, and historic non-building structures from damage during construction of the project alignments comprise project measure PM NOI-1 and are discussed below. These guidelines should be customized for listed or eligible historic properties. The detailed steps that may be required to protect historic and fragile buildings from damage during construction are as follows:

- Pre-Construction Survey: Metro or the contractor shall perform a pre-construction survey of the structural elements of historic buildings near major construction projects. Pre-construction surveys typically include inspecting building foundations, exterior, and interior elements and documenting any pre-existing defects such as cracks, settlement, subsidence, corrosion, or water damage. Defects that need to be monitored during construction shall be noted and, where appropriate, crack monitors shall be installed prior to the start of construction. For historic structures, the pre-construction survey also shall include an inspection of the historically significant features of the buildings, such as stained-glass windows, ornaments, and sheet metal cornices signboards in front of buildings, and engravings on the facade of buildings. The historical survey shall be performed by historic architects, and the structural survey shall be performed by qualified professional engineers prior to the start of construction. The survey report shall assist in the resolution of any damage claims that are made as a result of the construction. For Category 1 and Category 3 buildings, the survey shall document the type of use, location of use, and the existing vibration levels.
- Vibration Control Plan: Preliminary source vibration levels are presented in Table 3.14-15. These source levels are preliminary in nature and it is up to the contractor to verify and update information prior to and/or during construction. The contractor shall provide the results of the calculated vibration levels, with the locations for the calculations indicated on the site sketch in a vibration control plan to be submitted to Metro for approval. If the results of the vibration calculations or representative field data indicate that the predicted construction vibration levels exceed the damage risk criteria, the plan shall identify proposed vibration abatement measures and their anticipated vibration effects, include a schedule for their implementation, provide calculations demonstrating the effectiveness of the proposed abatement measures, and, if applicable, provide applicable drawings and sketches to indicate where such abatement measures would be placed.

TABLE 3.14-15. CONSTRUCTION VIBRATION

EQUIPMENT	PPV AT 25 FEET (INCH/SECOND)	APPROXIMATE L_V AT 25 FEET
Clam shovel drop (slurry wall)	0.202	94
Hydromill (slurry wall) in soil	0.0008	66
Hydromill (slurry wall) in rock	0.017	75
Vibratory roller	0.21	94
Hoe ram	0.089	87
Large bulldozer	0.089	87
Caisson drilling	0.089	87
Load trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

Source: FTA 2018
PPV = peak particle velocity; Lv = velocity level

- Vibration Monitoring: The primary goal of monitoring is to verify that the vibration limits are not exceeded. When construction activities that create high vibration levels are performed near vibration-sensitive buildings, the contractor would be required to monitor vibration to verify that the construction activities do not exceed the vibration limits. In addition, the contractor shall be required to perform testing to verify that the vibration levels would be below the applicable limits before starting the actual construction. For example, if vibratory compaction is needed near a historic building, a short test using the compactor would be monitored prior to starting the compaction to ensure that the vibration levels would be below the allowable limits. If vibration from the test approaches or exceeds the limits, the contractor shall immediately cease operations and conduct an inspection of the nearest historic property to determine if any damage occurred. The contractor shall be required to reduce the intensity of the vibratory compactor until the vibration amplitudes at all sensitive buildings are below the applicable limit before construction could resume. Only then would the actual vibratory compaction commence, with continued monitoring. The key guidelines for vibration monitoring are:
  - Minimize the use of impact devices, such as jackhammers, pavement breakers, and hoe rams that cause the highest vibration. Where possible, use concrete crushers or pavement saws rather than hoe rams for tasks such as concrete deck removal and retaining wall demolition.
  - Continuous vibration monitoring shall be performed whenever construction activities that generate high vibration levels are active within 100 feet of vibration-sensitive structures.
  - If the vibration levels exceed the allowable amplitudes, construction activities shall be halted immediately and the engineer shall be notified. Construction shall not be allowed to commence until the engineer approves the contractor's approach for reducing the vibration levels. The engineer shall be responsible for notifying property owners that the vibration limits were exceeded.

- For historic buildings, ground motion generated by construction activities shall not exceed a peak particle velocity (PPV) limit of 0.20 inch per second at any location within 10 feet of any part of the building. For the non-historic building structures, ground motion generated by construction activities shall not exceed a PPV limit of 0.50 inch per second at any location within 10 feet of any part of the structure.

- Visual Inspection During Construction: Follow-up visual inspection of particularly sensitive building features shall be performed during and after high vibration construction activities near sensitive buildings.
- Remove or Secure Fragile Elements: Before construction begins, some of the fragile elements in a building, such as chandeliers or wall decorations, shall be removed for the duration of the construction, or shall be more safely secured to the wall to ensure that they are not damaged or displaced due to high vibration activities.
- Secure or Repair Loose Elements: Any elements identified on a building as loose or in danger of damage due to a pre-existing condition shall be repaired prior to construction to ensure that high vibration activities do not exacerbate the problem. If it is not feasible to repair the element (which would be the building owner's responsibility), temporary means of securing the element shall be used.
- Alternative Construction Procedures: For some construction processes, it may not be feasible to meet the vibration limits. Examples include the use of vibratory compaction near churches and theaters, and operating large-tracked vehicles, such as bulldozers, next to sensitive buildings. In these cases, alternative construction processes may be required. Examples of these include use of non-vibratory compaction in limited areas and using a bobcat in place of large bulldozers within 25 feet of buildings.

3.14.6.2 PM NOI-2: FTA DETAILED VIBRATION ASSESSMENT

The vibration assessment conducted for this project is based on the conceptual design plans as of October 2023. Due to refinements that can occur in the design of the project, such as changes in depth or location of the tunnel, the predicted vibration impacts may be further analyzed once a preferred alignment is chosen. In the final design stage, Metro shall prepare an FTA Detailed Vibration Assessment for a more comprehensive analysis of the actual vibration impacts within the vicinity of the project.

This future vibration assessment would require borehole propagation tests at various locations within the vicinity of the project. The borehole tests would provide detailed data about which frequencies are transmitted through the ground.

The project is classified as a Frequent Event by the FTA vibration event criteria, as defined in the Transit Noise and Vibration Impact Assessment Manual (FTA 2018). Metro shall commit to constructing and operating the project within the FTA Category 3 land use GBV impact threshold of 75 VdB for Frequent Events. The FTA methodology includes a safety buffer of +5 VdB for all FTA thresholds to account for uncertainty in building amplification, future rail corrugations, and wheel roughness. Preparation of an FTA Detailed Vibration Assessment ensures construction and operation of the project would not exceed this GBV impact threshold.

3.14.7 IMPACT EVALUATION AND MITIGATION MEASURES

This analysis presents the construction and operational impacts for noise and vibration, as well as any applicable mitigation measures associated with KNE. A summary of the impact conclusions and applicable mitigation measures is found in Table 3.14-30 in Section 3.14.7.5.

3.14.7.1 IMPACT NOI-1: AMBIENT NOISE

Impact NOI-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?

3.14.7.1.1 KNE SAN VICENTE–FAIRFAX ALIGNMENT

3.14.7.1.1.1 CONSTRUCTION IMPACTS

Significant Impact. Construction of the KNE San Vicente–Fairfax Alignment would be required to comply with the local general plan or local noise ordinance. The actual construction approach and equipment will not be known until a contractor is identified.

At-grade construction at each station location would be the loudest phase, with a 1-hour L_{eq} of 91.2 dBA at 50 feet. This would exceed the LA City CEQA thresholds and the 1-hour L_{eq} FTA standards of 90 dBA during the day and 80 dBA at night for residential uses during cut-and-cover construction. The removal of soil and equipment during tunnel construction would exceed the nighttime 1-hour L_{eq} FTA standard and could exceed the daytime standards. Table 3.14-16 summarizes the impacts on noise-sensitive residential properties in the station RSAs during construction. Significant impacts would occur when either the FTA limit or the 5-dBA increase allowed in the LA City CEQA thresholds are exceeded. The table shows nearest sensitive land uses. When construction noise would result in a significant impact on a commercial building, the impacts are indicated in the table notes and are provided in the station descriptions below.

TABLE 3.14-16. CONSTRUCTION IMPACTS AT NOISE-SENSITIVE PROPERTIES WITHIN KNE SAN VICENTE–FAIRFAX ALIGNMENT RESOURCE STUDY AREA

STATION	ADDRESS OF NEAREST NOISE-SENSITIVE RECEIVER	DISTANCE TO NEAREST NOISE-SENSITIVE RECEIVER (FEET)	CONSTRUCTION PHASE	PREDICTED NOISE LEVEL (dBA)	# OF IMPACTS
Crenshaw/Adams*	2614 S Victoria Ave	25	At-Grade	94	6
			Cut-and-Cover	93	
			Tunnel (support)[1]	91	
Midtown Crossing	4729 San Vicente Blvd	110	At-Grade	81	20
			Cut-and-Cover	81	
			Tunnel (TBM)[2]	79	
Wilshire/Fairfax*	The Academy of Museum of Motion Pictures	20	At-Grade	94	3
			Cut-and-Cover	93	
			Tunnel (TBM)[2]	91	

STATION	ADDRESS OF NEAREST NOISE-SENSITIVE RECEIVER	DISTANCE TO NEAREST NOISE-SENSITIVE RECEIVER (FEET)	CONSTRUCTION PHASE	PREDICTED NOISE LEVEL (dBA)	# OF IMPACTS
Fairfax/3rd*,3	146 S Hayworth Ave4	150	At-Grade	79	4
			Cut-and-Cover	78	
			Tunnel (support)1	76	
La Cienega/Beverly*,5	321 N Alfred Street	70	At-Grade	85	3
			Cut-and-Cover	84	
			Tunnel (support)1	81	
San Vicente/Santa Monica*	830 Palm Ave	40	At-Grade	90	3
			Cut-and-Cover	89	
			Tunnel (TBM)2	87	
Fairfax/Santa Monica*,5	1050 N Orange Grove	150	At-Grade	74	3
			Cut-and-Cover	73	
			Tunnel (support)1	73	
La Brea/Santa Monica*	7100 Santa Monica Blvd	30	At-Grade	96	70
			Cut-and-Cover	95	
			Tunnel (TBM)2	96	
Hollywood/Highland*	1724 Highland Ave	30	At-Grade	92	3
			Cut-and-Cover	93	
			Tunnel (TBM)2	92	

Source: Connect Los Angeles Partners 2023

* There would be a significant impact at stations shown in **bold** and with an asterisk (*).

1 Construction phases identified as "Tunnel (support)" indicate stations that would not serve as TBM launch or retrieval sites. Construction during the tunnel phase at these stations may include surface activities such as operation of generators and air compressors, lifts to provide access to underground work, cranes to deliver and remove supplies and equipment, and haul trucks.

2 Construction phases identified as "Tunnel (TBM)" indicate stations that would serve as TBM launch or retrieval sites. At these stations, there would be noise impacts from surface construction and staging activities in support of the TBM, such as trucks to deliver supplies and haul away spoils, and operation of generators and air compressors. There would be no noise impacts from underground activities during the tunnel phase, including TBM operation.

3 During construction of the Fairfax/3rd Station, noise levels at office and commercial land use along Fairfax Avenue would be 99 dBA during the at-grade phase, 98 dBA during the cut-and-cover phase, and 96 dBA during the tunnel phase, which are below FTA's commercial daytime and nighttime 1-hour L_{eq} limits; however, the noise levels may be more than the 5-dBA increase allowed in the LA City CEQA thresholds.

4 Hancock Park Elementary School (408 S Fairfax Ave) would be within approximately 50 feet of a construction staging area but more than 250 feet from the station RSA. The at-grade, cut-and-cover, and tunnel construction activities associated with the station RSA would not occur at construction staging areas, where noise levels would be much lower. Therefore, 146 S Hayworth Ave is still considered the nearest receptor for impact purposes.

5 During construction of the La Cienega/Beverly and Fairfax/Santa Monica Stations, noise levels at office and commercial land uses along Fairfax Avenue would be 96 dBA during the at-grade phase, 95 dBA during the cut-and-cover phase, and 93 dBA during the tunnel phase, which are below FTA's commercial daytime and nighttime 1-hour L_{eq} limits; however, the noise levels may be more than the 5-dBA increase allowed in the LA City CEQA thresholds.

dBA = A-weighted decibels; RSA = resource study area; TBM = tunnel boring machine

The following provides construction noise analysis for each of the KNE San Vicente–Fairfax Alignment stations:

- Crenshaw/Adams Station – **Significant Impact.** The nearest residential dwelling unit to the proposed construction area is 25 feet away (Table 3.14-16). Construction noise levels at that distance would be an hourly L_{eq} of more than 94 dBA during the at-grade construction phase, more than 93 dBA during the cut-and-cover phase, and more than 91 dBA during the tunnel phase, which would exceed local and FTA residential daytime and nighttime 1-hour L_{eq} limits. This would be considered a substantial temporary increase in ambient noise levels above the 5 dBA allowed in the LA City CEQA thresholds and above the FTA general assessment construction noise limit standard at six dwelling units. Therefore, the Crenshaw/Adams Station would have a significant impact during construction, and mitigation would be required.
- Midtown Crossing Station – **Less than Significant Impact.** The nearest residential dwelling unit to the proposed construction area is 110 feet away (Table 3.14-16). Construction noise levels at that distance would be an hourly L_{eq} of more than 81 dBA during the at-grade phase, more than 81 dBA during the cut-and-cover phase, and more than 79 dBA during the tunnel phase. This would not be considered a substantial temporary increase in ambient noise levels above the 5 dBA allowed in the LA City CEQA thresholds nor of the FTA general assessment construction noise limit standard. Therefore, the Midtown Crossing Station would have a less than significant impact during construction.
- Wilshire/Fairfax Station – **Significant Impact.** The nearest residential dwelling unit to the proposed construction area is 20 feet away (Table 3.14-16). Construction noise levels at that distance would be an hourly L_{eq} of more than 94 dBA during the at-grade phase, 93 dBA during the cut-and-cover phase, and more than 91 dBA during the tunnel phase. Construction would be located on Fairfax Avenue, within 20 feet of the Academy Museum of Motion Pictures. This would be considered a substantial temporary increase in ambient noise levels above the 5 dBA allowed in the LA City CEQA thresholds and above the FTA general assessment construction noise limit standard. Therefore, the Wilshire/Fairfax Station would have a significant impact during construction, and mitigation would be required.
- Fairfax/3rd Station – **Significant Impact.** The nearest residential dwelling unit to the proposed construction area is 150 feet away (Table 3.14-16). Construction noise levels at that distance would be an hourly L_{eq} less than 79 dBA during the at-grade phase, less than 78 dBA during the cut-and-cover phase, and less than 76 dBA during the tunnel phase, which are below FTA's residential daytime and nighttime 1-hour L_{eq} limits; however, the noise levels may be above the 5 dBA allowed in the LA City CEQA thresholds at four dwelling units. The noise levels at the office and commercial land use along Fairfax Avenue would be 99 dBA during the at-grade phase, 98 dBA during the cut-and-cover phase, and 96 dBA during the tunnel phase, which are below FTA's commercial daytime and nighttime 1-hour L_{eq} limits; however, the noise levels may be in excess of the 5-dBA increase allowed in the LA City CEQA thresholds. Hancock Park Elementary School is located approximately 50 feet from a construction staging area but outside the station RSA. The school could experience increases in noise levels due to activities at the construction staging area, primarily involving movement of equipment. Although noise levels would be lower than those associated with at-grade, cut-and-cover, and tunnel TBM/support construction

activities (approximately 250 feet from the school), increases could be above the 5 dBA allowed in the LA City CEQA thresholds. Therefore, the Fairfax/3rd Station would have a significant impact during construction, and mitigation would be required.

- La Cienega/Beverly Station – **Significant Impact.** The nearest residential dwelling unit to the proposed construction is 70 feet away (Table 3.14-16). Construction noise levels at that distance would be an hourly L_{eq} less than 85 dBA during the at-grade phase, 84 dBA during the cut-and-cover phase, and 81 dBA during the tunnel phase. The noise levels at the office and commercial land use along Fairfax would be 96 dBA during the at-grade phase, 95 dBA during the cut-and-cover phase, and 93 dBA during the tunnel phase. While these levels are below the FTA daytime and nighttime 1-hour L_{eq} limits, the noise levels may increase above the 5 dBA allowed in the LA City CEQA thresholds at three dwelling units. Therefore, the La Cienega/Beverly Station would have a significant impact during construction, and mitigation would be required.
- San Vicente/Santa Monica Station – **Significant Impact.** The nearest residential dwelling unit to the construction is 40 feet away (Table 3.14-16). Construction noise levels at that distance would be an hourly L_{eq} over 90 dBA during the at-grade phase, 89 dBA during the cut-and-cover phase, and 87 dBA during the tunnel phase. This would be considered a substantial temporary increase in ambient noise levels at three dwelling units. Therefore, the San Vicente/Santa Monica Station would have a significant impact during construction, and mitigation would be required.
- Fairfax/Santa Monica Station – **Significant Impact.** The nearest residential dwelling unit to the construction is 150 feet away (Table 3.14-16). Construction noise levels at that distance would be an hourly L_{eq} under 74 dBA during the at-grade phase, 73 dBA during the cut-and-cover phase, and 73 dBA during the tunnel phase. The noise levels at the office and commercial land use along Fairfax would be 96 dBA during the at-grade phase, 95 dBA during the cut-and-cover phase, and 93 dBA during the tunnel phase. This would be considered a substantial temporary increase in ambient noise levels at three dwelling units. Therefore, the Fairfax/Santa Monica Station would have a significant impact during construction, and mitigation would be required.
- La Brea/Santa Monica Station – **Significant Impact.** The nearest residential dwelling unit to the construction is 30 feet away (Table 3.14-16). Construction noise levels at that distance would be an hourly L_{eq} more than 96 dBA during the at-grade phase, more than 95 dBA during the cut-and-cover phase, and more than 96 dBA during the tunnel phase. The noise levels may increase above the 5 dBA allowed in the LA City CEQA thresholds. This would be considered a substantial temporary increase in ambient noise levels at 70 dwelling units. Therefore, the La Brea/Santa Monica Station would have a significant impact during construction, and mitigation would be required.
- Hollywood/Highland Station – **Significant Impact.** The nearest residential dwelling unit to the construction is 30 feet away (Table 3.14-16). Construction noise levels at that distance would be an hourly L_{eq} over 92 dBA during the at-grade phase, more than 93 dBA during the cut-and-cover phase, and more than 92 dBA during the tunnel phase. This would be considered a substantial temporary increase in ambient noise levels at three dwelling units. Therefore, the Hollywood/Highland Station would have a significant impact during construction, and mitigation would be required.

Construction of eight of the stations (all except the Midtown Crossing Station) would generate substantial temporary increases in ambient noise levels in excess of standards established in the applicable CEQA thresholds and/or the applicable FTA noise-level criteria. Therefore, the KNE San Vicente–Fairfax Alignment would have a significant impact during construction, and mitigation would be required.

3.14.7.1.1.2 OPERATIONAL IMPACTS

No Impact. Of the nine stations along the KNE San Vicente–Fairfax Alignment, six have noise-sensitive land uses within their RSAs: Crenshaw/Adams, Midtown Crossing, Wilshire/Fairfax, La Cienega/Beverly, San Vicente/Santa Monica, and La Brea/Santa Monica. However, no additional parking or buses are planned for any of these stations, so noise from operations would be limited to people at the stations and the escalators and elevators used to enter and exit the stations. The noise-sensitive land uses within the RSA are all 100 feet or more from the proposed station entrances, and there would be no direct line of sight between the light rail vehicles at the stations and aboveground sensitive receivers. As a result, noise levels associated with operation of stations would be far below the applicable FTA noise-level criteria.

Outside the station areas, operation of the alignment would occur underground, so there would be no increase in airborne noise level to any of the noise-sensitive land uses in the RSA. Station activities that occur aboveground would not involve any noise-generating equipment. For these reasons, operation of the alignment would not result in an increase in ambient noise levels. Therefore, the KNE San Vicente–Fairfax Alignment would have no impact during operation.

3.14.7.1.2 KNE FAIRFAX ALIGNMENT

3.14.7.1.2.1 CONSTRUCTION IMPACTS

Significant Impact. Construction of the KNE Fairfax Alignment would be required to comply with the local general plan or local noise ordinance. The actual construction approach and equipment will not be known until a contractor is identified.

At-grade construction at each station location would be the loudest phase, with a 1-hour L_{eq} of 91.2 dBA at 50 feet. This would exceed the LA City CEQA thresholds and the 1-hour L_{eq} FTA standards of 90 dBA during the day and 80 dBA at night for residential uses during cut-and-cover construction. The removal of soil and equipment during tunnel construction would exceed the nighttime 1-hour L_{eq} FTA standard and could exceed the daytime standards. Table 3.14-17 summarizes the impacts on noise-sensitive residential properties in the station RSAs during construction. Significant impacts would occur when either the FTA limit or the 5-dBA increase allowed in the LA City CEQA thresholds are exceeded. The table shows nearest sensitive land uses. When construction noise would result in a significant impact on a commercial building, the impacts are indicated in the table notes and are provided in the station descriptions below.

TABLE 3.14-17. CONSTRUCTION IMPACTS AT NOISE-SENSITIVE PROPERTIES WITHIN KNE FAIRFAX ALIGNMENT RESOURCE STUDY AREA

STATION	ADDRESS OF NEAREST NOISE-SENSITIVE RECEIVER	DISTANCE TO NEAREST NOISE-SENSITIVE RECEIVER (FEET)	CONSTRUCTION PHASE	PREDICTED NOISE LEVEL (dBA)	# OF IMPACTS
Crenshaw/Adams*	2614 S Victoria Ave	25	At-Grade	94	6
			Cut-and-Cover	93	
			Tunnel (support)[1]	91	
Midtown Crossing	4729 San Vicente Blvd	110	At-Grade	81	20
			Cut-and-Cover	81	
			Tunnel (TBM)[2]	79	
Wilshire/Fairfax*	The Academy of Museum of Motion Pictures	20	At-Grade	94	3
			Cut-and-Cover	93	
			Tunnel (TBM)[2]	91	
Fairfax/3rd*[,3]	146 S Hayworth Ave[4]	150	At-Grade	79	4
			Cut-and-Cover	78	
			Tunnel (support)[1]	76	
Fairfax/Santa Monica*[,5]	1050 N Orange Grove	150	At-Grade	74	3
			Cut-and-Cover	73	
			Tunnel (support)[1]	73	
La Brea/Santa Monica*	7100 Santa Monica Blvd	30	At-Grade	96	70
			Cut-and-Cover	95	
			Tunnel (TBM)[2]	96	
Hollywood/Highland*	1724 Highland Ave	30	At-Grade	92	3
			Cut-and-Cover	93	
			Tunnel (TBM)[2]	92	

Source: Connect Los Angeles Partners 2023

* There would be a significant impact at stations shown in **bold** and with an asterisk (*).

[1] Construction phases identified as "Tunnel (support)" indicate stations that would not serve as TBM launch or retrieval sites. Construction during the tunnel phase at these stations may include surface activities such as operation of generators and air compressors, lifts to provide access to underground work, cranes to deliver and remove supplies and equipment, and haul trucks.

[2] Construction phases identified as "Tunnel (TBM)" indicate stations that would serve as TBM launch or retrieval sites. At these stations, there would be noise impacts from surface construction and staging activities in support of the TBM, such as trucks to deliver supplies and haul away spoils, and operation of generators and air compressors. There would be no noise impacts from underground activities during the tunnel phase, including TBM operation.

[3] During construction of the Fairfax/3rd Station, noise levels at office and commercial land use along Fairfax Avenue would be 99 dBA during the at-grade phase, 98 dBA during the cut-and-cover phase, and 96 dBA during the tunnel phase, which are below FTA's commercial daytime and nighttime 1-hour L_{eq} limits; however, the noise levels may be more than the 5-dBA increase allowed in the LA City CEQA thresholds.

[4] Hancock Park Elementary School (408 S Fairfax Ave) would be within approximately 50 feet of a construction staging area but more than 250 feet from the station RSA. The at-grade, cut-and-cover, and tunnel construction activities associated with the station RSA would not occur at construction staging areas, where noise levels would be much lower. Therefore, 146 S Hayworth Ave is still considered the nearest receptor for impact purposes.

[5] During construction of the Fairfax/Santa Monica Station, noise levels at office and commercial land uses along Fairfax Avenue would be 96 dBA during the at-grade phase, 95 dBA during the cut-and-cover phase, and 93 dBA during the tunnel phase, which are below FTA's commercial daytime and nighttime 1-hour L_{eq} limits; however, the noise levels may be more than the 5-dBA increase allowed in the LA City CEQA thresholds.

dBA = A-weighted decibels; RSA = resource study area; TBM = tunnel boring machine

The following provides construction noise analysis for each of the KNE Fairfax Alignment stations:

- Crenshaw/Adams Station – **Significant Impact.** The nearest residential dwelling unit to the proposed construction area is 25 feet away (Table 3.14-17). Construction noise levels at that distance would be an hourly L_{eq} of more than 94 dBA during the at-grade construction phase, more than 93 dBA during the cut-and-cover phase, and more than 91 dBA during the tunnel phase, which would exceed local and FTA residential daytime and nighttime 1-hour L_{eq} limits. This would be considered a substantial temporary increase in ambient noise levels above the 5 dBA allowed in the LA City CEQA thresholds and above the FTA general assessment construction noise limit standard at six dwelling units. Therefore, the Crenshaw/Adams Station would have a significant impact during construction, and mitigation would be required.
- Midtown Crossing Station – **Less than Significant Impact.** The nearest residential dwelling unit to the proposed construction area is 110 feet away (Table 3.14-17). Construction noise levels at that distance would be an hourly L_{eq} of more than 81 dBA during the at-grade phase, more than 81 dBA during the cut-and-cover phase, and more than 79 dBA during the tunnel phase. This would not be considered a substantial temporary increase in ambient noise levels above the 5 dBA allowed in the LA City CEQA thresholds nor of the FTA general assessment construction noise limit standard. Therefore, the Midtown Crossing Station would have a less than significant impact during construction.
- Wilshire/Fairfax Station – **Significant Impact.** The nearest residential dwelling unit to the proposed construction area is 20 feet away (Table 3.14-17). Construction noise levels at that distance would be an hourly L_{eq} of more than 94 dBA during the at-grade phase, 93 dBA during the cut-and-cover phase, and more than 91 dBA during the tunnel phase. Construction would be located on Fairfax Avenue, within 20 feet of the Academy Museum of Motion Pictures. This would be considered a substantial temporary increase in ambient noise levels above the 5 dBA allowed in the LA City CEQA thresholds and above the FTA general assessment construction noise limit standard. Therefore, the Wilshire/Fairfax Station would have a significant impact during construction, and mitigation would be required.
- Fairfax/3rd Station – **Significant Impact.** The nearest residential dwelling unit to the proposed construction area is 150 feet away (Table 3.14-17). Construction noise levels at that distance would be an hourly L_{eq} of less than 79 dBA during the at-grade phase, less than 78 dBA during the cut-and-cover phase, and less than 76 dBA during the tunnel phase, which are below FTA's residential daytime and nighttime 1-hour L_{eq} limits; however, the noise levels may be above the 5 dBA allowed in the LA City CEQA thresholds at four dwelling units. The noise levels at the office and commercial land use along Fairfax Avenue would be 99 dBA during the at-grade phase, 98 dBA during the cut-and-cover phase, and 96 dBA during the tunnel phase, which are below FTA's commercial daytime and nighttime 1-hour L_{eq} limits; however, the noise levels may be in excess of the 5-dBA increase allowed in the LA City CEQA thresholds. Hancock Park Elementary School is located approximately 50 feet from a construction staging area but outside the station RSA. The school could experience increases in noise levels due to activities at the construction staging area, primarily involving movement of equipment. Although noise levels would be lower than those associated with at-grade, cut-and-cover, and tunnel TBM/support construction activities (approximately 250 feet from the school), increases could be above the 5 dBA allowed

in the LA City CEQA thresholds. Therefore, the Fairfax/3rd Station would have a significant impact during construction, and mitigation would be required.

- Fairfax/Santa Monica Station – **Significant Impact.** The nearest residential dwelling unit to the construction is 150 feet away (Table 3.14-17). Construction noise levels at that distance would be an hourly L_{eq} under 74 dBA during the at-grade phase, 73 dBA during the cut-and-cover phase, and 73 dBA during the tunnel phase. The noise levels at the office and commercial land use along Fairfax would be 96 dBA during the at-grade phase, 95 dBA during the cut-and-cover phase, and 93 dBA during the tunnel phase. This would be considered a substantial temporary increase in ambient noise levels at three dwelling units. Therefore, the Fairfax/Santa Monica Station would have a significant impact during construction, and mitigation would be required.
- La Brea/Santa Monica Station – **Significant Impact.** The nearest residential dwelling unit to the construction is 30 feet away (Table 3.14-17). Construction noise levels at that distance would be an hourly L_{eq} of more than 96 dBA during the at-grade phase, more than 95 dBA during the cut-and-cover phase, and more than 96 dBA during the tunnel phase. The noise levels may increase above the 5 dBA allowed in the LA City CEQA thresholds. This would be considered a substantial temporary increase in ambient noise levels at 70 dwelling units. Therefore, the La Brea/Santa Monica Station would have a significant impact during construction, and mitigation would be required.
- Hollywood/Highland Station – **Significant Impact.** The nearest residential dwelling unit to the construction is 30 feet away (Table 3.14-17). Construction noise levels at that distance would be an hourly L_{eq} over 92 dBA during the at-grade phase, more than 93 dBA during the cut-and-cover phase, and more than 92 dBA during the tunnel phase. This would be considered a substantial temporary increase in ambient noise levels at three dwelling units. Therefore, the Hollywood/Highland Station would have a significant impact during construction, and mitigation would be required.

Construction of six of the stations (all except the Midtown Crossing Station) would generate substantial temporary increases in ambient noise levels in excess of standards established in the applicable CEQA thresholds and/or the applicable FTA noise-level criteria. Therefore, the KNE Fairfax Alignment would have a significant impact during construction, and mitigation would be required.

3.14.7.1.2.2 OPERATIONAL IMPACTS

No Impact. Of the seven stations along the KNE Fairfax Alignment, four have noise-sensitive land uses within their RSAs: Crenshaw/Adams, Midtown Crossing, Wilshire/Fairfax, and La Brea/Santa Monica. However, no additional parking or buses are planned for any of these stations, so noise from operations would be limited to people at the stations and the escalators and elevators used to enter and exit the stations. The noise-sensitive land uses within the RSA are all 100 feet or more from the proposed station entrances, and there would be no direct line of sight between the light rail vehicles at the stations and aboveground sensitive receivers. As a result, noise levels associated with operation of stations would be far below the applicable FTA noise-level criteria.

Outside the station areas, operation of the alignment would occur underground, so there would be no increase in airborne noise levels to any of the noise-sensitive land uses in the RSA. Station activities that occur aboveground would not involve any noise-generating equipment. For these reasons, operation of the alignment would not result in an increase in ambient noise levels. Therefore, the KNE Fairfax Alignment would have no impact during operation.

3.14.7.1.3 KNE LA BREA ALIGNMENT

3.14.7.1.3.1 CONSTRUCTION IMPACTS

Significant Impact. Construction of the KNE La Brea Alignment would be required to comply with the local general plan or local noise ordinance. The actual construction approach and equipment will not be known until a contractor is identified.

At-grade construction at each station location would be the loudest phase, with a 1-hour L_{eq} of 91.2 dBA at 50 feet. This would exceed the LA City CEQA thresholds and the 1-hour L_{eq} FTA standards of 90 dBA during the day and 80 dBA at night for residential uses during cut-and-cover construction. The removal of soil and equipment during tunnel construction would exceed the nighttime 1-hour L_{eq} FTA standard and could exceed the daytime standards. Table 3.14-18 summarizes the impacts on noise-sensitive residential properties in the station RSAs during construction. Significant impacts would occur when either the FTA limit or the 5-dBA increase allowed in the LA City CEQA thresholds are exceeded. The table shows nearest sensitive land uses. When construction noise would result in a significant impact on a commercial building, the impacts are indicated in the table notes and are provided in the station descriptions below.

TABLE 3.14-18. CONSTRUCTION IMPACTS AT NOISE-SENSITIVE PROPERTIES WITHIN KNE LA BREA ALIGNMENT RESOURCE STUDY AREA

STATION	ADDRESS OF NEAREST NOISE-SENSITIVE RECEIVER	DISTANCE TO NEAREST NOISE-SENSITIVE RECEIVERS (FEET)	CONSTRUCTION PHASE	PREDICTED NOISE LEVEL (dBA)	# OF IMPACTS
Crenshaw/Adams*	2614 S Victoria Ave	25	At-Grade	94	6
			Cut-and-Cover	93	
			Tunnel (support)[1]	91	
Midtown Crossing	4729 San Vicente Blvd	110	At-Grade	81	20
			Cut-and-Cover	81	
			Tunnel (TBM)[2]	79	
Wilshire/La Brea*	460 S Detroit St	30	At-Grade	96	54
			Cut-and-Cover	95	
			Tunnel (TBM)[2]	96	
La Brea/Beverly*	318 N Detroit St	30	At-Grade	96	46
			Cut-and-Cover	95	
			Tunnel (support)[1]	96	
La Brea/Santa Monica*	7100 Santa Monica Blvd	30	At-Grade	96	70
			Cut-and-Cover	95	
			Tunnel (TBM)[2]	96	
Hollywood/Highland*	1724 Highland Ave	30	At-Grade	92	3
			Cut-and-Cover	93	
			Tunnel (TBM)[2]	92	

Source: Connect Los Angeles Partners 2023

***** There would be a significant impact at stations shown in **bold** and with an asterisk (*****).

[1] Construction phases identified as "Tunnel (support)" indicate stations that would not serve as TBM launch or retrieval sites. Construction during the tunnel phase at these stations may include surface activities such as operation of generators and air compressors, lifts to provide access to underground work, cranes to deliver and remove supplies and equipment, and haul trucks.

[2] Construction phases identified as "Tunnel (TBM)" indicate stations that would serve as TBM launch or retrieval sites. At these stations, there would be noise impacts from surface construction and staging activities in support of the TBM, such as trucks to deliver supplies and haul away spoils, and operation of generators and air compressors. There would be no noise impacts from underground activities during the tunnel phase, including TBM operation.

dBA = A-weighted decibels; RSA = resource study area; TBM = tunnel boring machine

The following provides construction noise analysis for each of the La Brea Alignment stations:

- Crenshaw/Adams Station – Significant Impact. The nearest residential dwelling unit to the proposed construction area is 25 feet away (Table 3.14-18). Construction noise levels at that distance would be an hourly L_{eq} of more than 94 dBA during the at-grade construction phase, more than 93 dBA during the cut-and-cover phase, and more than 91 dBA during the tunnel phase, which would exceed local and FTA residential daytime and nighttime 1-hour L_{eq} limits. This would be considered a substantial temporary increase in ambient noise levels above the 5 dBA allowed in the LA City CEQA thresholds and above the FTA general assessment construction noise limit standard at six dwelling units. Therefore, the Crenshaw/Adams Station would have a significant impact during construction, and mitigation would be required.
- Midtown Crossing Station – Less than Significant Impact. The nearest residential dwelling unit to the proposed construction area is 110 feet away (Table 3.14-18). Construction noise levels at that distance would be an hourly L_{eq} of more than 81 dBA during the at-grade phase, more than 81 dBA during the cut-and-cover phase, and more than 79 dBA during the tunnel phase. This would not be considered a substantial temporary increase in ambient noise levels above the 5 dBA allowed in the LA City CEQA thresholds nor of the FTA general assessment construction noise limit standard. Therefore, the Midtown Crossing Station would have a less than significant impact during construction.
- Wilshire/La Brea Station – Significant Impact. The nearest residential dwelling unit to the proposed construction area is 30 feet away (Table 3.14-18). Construction noise levels at that distance would be an hourly L_{eq} of more than 96 dBA during the at-grade construction phase, more than 95 dBA during the cut-and-cover phase, and more than 96 dBA during the tunnel phase, which exceed local and FTA's residential daytime and nighttime 1-hour L_{eq} limits. This would be considered a substantial temporary increase in ambient noise levels above the 5 dBA allowed in the LA City CEQA thresholds and above the FTA general assessment construction noise limit standard on 54 dwelling units. Therefore, the Wilshire/La Brea Station would have a significant impact during construction, and mitigation would be required.
- La Brea/Beverly Station – Significant Impact. The nearest residential dwelling unit to the proposed construction area is 30 feet away (Table 3.14-18). Construction noise levels at that distance would be an hourly L_{eq} of more than 96 dBA during the at-grade construction phase, more than 95 dBA during the cut-and-cover phase, and more than 96 dBA during the tunnel phase, which exceed local and FTA's residential daytime and nighttime 1-hour L_{eq} limits. This would be considered a substantial temporary increase in ambient noise levels above the 5 dBA allowed in the LA City CEQA thresholds and above the FTA general assessment construction noise limit standard on 46 dwelling units. Therefore, the La Brea/Beverly Station would have a significant impact during construction, and mitigation would be required.
- La Brea/Santa Monica Station – Significant Impact. The nearest residential dwelling unit to the construction is 30 feet away (Table 3.14-18). Construction noise levels at that distance would be an hourly L_{eq} of more than 96 dBA during the at-grade phase, more than 95 dBA during the cut-and-cover phase, and more than 96 dBA during the tunnel phase. The noise levels may increase above the 5 dBA allowed in the LA City CEQA thresholds. This would be considered a substantial temporary increase in ambient noise levels at 70 dwelling units. Therefore, the La Brea/Santa Monica Station would have a significant impact during construction, and mitigation would be required.

- Hollywood/Highland Station– Significant Impact. The nearest residential dwelling unit to the construction is 30 feet away (Table 3.14-18). Construction noise levels at that distance would be an hourly L_{eq} over 92 dBA during the at-grade phase, more than 93 dBA during the cut-and-cover phase, and more than 92 dBA during the tunnel phase. This would be considered a substantial temporary increase in ambient noise levels at three dwelling units. Therefore, the Hollywood/Highland Station would have a significant impact during construction, and mitigation would be required.

Construction of five of the La Brea Alignment stations (all except the Midtown Crossing Station) would generate substantial temporary increases in ambient noise levels in excess of standards established in the LA City CEQA thresholds and/or the applicable FTA noise-level criteria. Therefore, the KNE La Brea Alignment would have a significant impact during construction, and mitigation would be required.

3.14.7.1.3.2 OPERATIONAL IMPACTS

No Impact. Of the six stations along the La Brea Alignment, five have noise-sensitive land uses within their RSAs: Crenshaw/Adams, Midtown Crossing, Wilshire/La Brea, La Brea/Beverly, and La Brea/Santa Monica. However, no additional parking or buses are planned for any of these stations, so noise from operations would be limited to people at the stations and the escalators and elevators used to enter and exit the stations. The noise-sensitive land uses within the RSA are all 100 feet or more from the proposed station entrances, and there would be no direct line of sight between the light rail vehicles at the stations and aboveground sensitive receivers. As a result, noise levels associated with operation of stations would be far below the applicable FTA noise-level criteria.

Outside the station areas, operation of the alignment would occur underground, so there would be no increase in airborne noise levels to any of the noise-sensitive land uses in the RSA. Station activities that occur aboveground would not involve any noise-generating equipment. For these reasons, operation of the alignment would not result in an increase in ambient noise levels. Therefore, the KNE La Brea Alignment would have no impact during operation.

3.14.7.1.4 HOLLYWOOD BOWL DESIGN OPTION

3.14.7.1.4.1 CONSTRUCTION IMPACTS

Significant Impact. The Hollywood Bowl Design Option would be located under Highland Avenue, with construction staging areas proposed within Parking Lots B, C, and D of the Hollywood Bowl. The nearest residential dwelling unit to the proposed construction area is 70 feet away (Table 3.14-19). Construction noise levels at sensitive receivers would be an hourly L_{eq} of less than 85 dBA during the at-grade phase, less than 84 dBA during the cut-and-cover phase, and less than 81 dBA during the tunnel phase. The nearest sensitive noise receiver is more than 200 feet from the entrance to the Hollywood Bowl. Construction activity may be considered a substantial temporary increase in ambient noise levels above the 5 dBA allowed in the LA City CEQA thresholds at 40 dwelling units. Therefore, the Hollywood Bowl Design Option (Hollywood Bowl Station) would have a significant impact during construction, and mitigation would be required.

TABLE 3.14-19. CONSTRUCTION IMPACTS AT NOISE-SENSITIVE RESIDENTIAL PROPERTIES WITHIN HOLLYWOOD BOWL DESIGN OPTION RESOURCE STUDY AREA

STATION	ADDRESS OF NEAREST NOISE-SENSITIVE RECEIVER	DISTANCE TO NEAREST NOISE-SENSITIVE RECEIVERS (FEET)	CONSTRUCTION PHASE	PREDICTED NOISE LEVEL (dBA)	# OF IMPACTS
Hollywood Bowl Station*	2614 S Victoria Ave	70	At-Grade	85	40
			Cut-and-Cover	84	
			Tunnel (TBM)[1]	81	

Source: Connect Los Angeles Partners 2023
dBA = A-weighted decibels; RSA = resource study area; TBM = tunnel boring machine
* Significant Impact
[1] "Tunnel (TBM)" indicates that the Hollywood Bowl Station would serve as a TBM retrieval site during the tunnel construction phase. There would be noise impacts from surface construction and staging activities in support of the TBM, such as trucks to deliver supplies and haul away spoils, and operation of generators and air compressors. There would be no noise impacts from underground activities during the tunnel phase, including TBM operation.

3.14.7.1.4.2 OPERATIONAL IMPACTS

No Impact. No noise-sensitive land uses are located within the RSA of the station associated with the Hollywood Bowl Design Option. The Hollywood Bowl is located more than 200 feet from the proposed design option. Therefore, the design option would have no impact during operation.

3.14.7.1.5 MAINTENANCE AND STORAGE FACILITY

3.14.7.1.5.1 CONSTRUCTION IMPACTS

No Impact. The MSF site is within 0.5 mile of Los Angeles International Airport (LAX). While construction of the MSF expansion would expose people working in the area to increased noise levels, existing noise levels in this area are high due to the overflights of planes landing at LAX and from roadways and industrial land use. All construction activities associated with the MSF would be aboveground. However, there are no residential land uses within 200 feet of the proposed construction. Therefore, the MSF would have no impact during construction.

3.14.7.1.5.2 OPERATIONAL IMPACTS

No Impact. As described for construction impacts, existing noise levels in the MSF RSA are high due to the overflights of planes landing at LAX. No noise-sensitive land uses are located within the MSF RSA. Therefore, the MSF would have no impact during operation.

3.14.7.2 IMPACT NOI-2: GROUND-BORNE NOISE AND VIBRATION

Impact NOI-2: Would the project result in generation of excessive GBV or GBN levels?

3.14.7.2.1 KNE SAN VICENTE–FAIRFAX ALIGNMENT

3.14.7.2.1.1 CONSTRUCTION IMPACTS

Less than Significant Impact. During construction, GBV and GBN would be of concern primarily in the tunnel phase. As such, the study of potential GBV and GBN construction impacts focuses on the underground alignments. Potential GBV and GBN impacts could also occur in the early stages of the cut-and-cover alignment construction and during aboveground station construction activities, but this would depend on the method of construction that the contractor chooses to use.

The predicted GBV and GBN at sensitive receivers in the RSA above the underground portions of the KNE San Vicente–Fairfax Alignment are presented in Table 3.14-20 for FTA Special Buildings, Table 3.14-21 for FTA Category 2 residential land uses, and Table 3.14-22 for FTA Category 3 institutional land uses.[1] Project measure PM NOI-1 would be implemented to protect any Category 1 or 3 land uses, historic buildings, and historic non-building structures from damage during construction. Project measure PM NOI-2 would also be implemented to ensure that at a later stage of design, once a preferred alignment is selected, an FTA Detailed Vibration Assessment would be conducted to further analyze vibration impacts. As a result, the predicted GBV and GBN at sensitive receivers above the underground portions of the alignment would not exceed FTA impact criteria.

Construction of the tunnel would be mostly underground. Vibration from the tunnel boring machine would be at or below the levels predicted for light rail vehicle operations. Implementation of a vibration control plan and vibration monitoring as per project measure PM NOI-1 would ensure station construction at the surface would not result in excessive GBV and GBN levels. The vibration generated by the tunnel boring machine would be temporary, lasting for a few days as it passes under the different receiver locations. Therefore, the KNE San Vicente–Fairfax Alignment would have a less than significant impact during construction.

3.14.7.2.1.2 OPERATIONAL IMPACTS

Less than Significant Impact. Operation of the KNE San Vicente–Fairfax Alignment would also occur primarily underground, which is the only potential source of GBV and GBN impacts from light rail vehicle operations. Light rail vehicles moving through the stations would be the concern for operational vibration impacts at the station locations. The only operational activity that would not be underground is people entering and exiting the station, which has no risk of GBV or GBN impacts. However, because borehole line source response testing was not conducted as part of this assessment, the theaters and performing arts spaces identified as FTA Special Buildings would require further study as part of final design.

While there are FTA Special Buildings, Category 2 residential land uses, and Category 3 institutional land uses in the KNE San Vicente–Fairfax Alignment RSA, as shown in Table 3.14-20, Table 3.14-21, and Table 3.14-22, the predicted GBV and GBN at sensitive receivers in the RSA would not exceed FTA impact criteria. Therefore, the KNE San Vicente–Fairfax Alignment would have a less than significant impact during operation.

[1] For this analysis, the Academy Museum of Motion Pictures is considered a Category 3 land use due to its usage as a movie theater.

TABLE 3.14-20. KNE SAN VICENTE–FAIRFAX ALIGNMENT PREDICTED VIBRATION LEVELS AT FTA SPECIAL BUILDINGS

CITY	BUILDING ACTIVITIES AND ADDRESS	PREDICTED GBV[1]	FTA GBV CRITERIA (VdB)	GBV EXCEEDANCE (Y/N)	PREDICTED GBN[2]	FTA GBN CRITERIA (dBA)	GBN EXCEEDANCE (Y/N)
Los Angeles	West Angeles Performing Arts Theatre 3020 Crenshaw Blvd	53	72	N	30	35	N
West Hollywood	Education/Lee Strasberg Theatre 7936 Santa Monica Blvd	52	72	N	28	35	N
Los Angeles	Hollywood High School Theater 1521 N Highland Ave	60	72	N	33	35	N

Source: Connect Los Angeles Partners 2023
Note: Vibration from the TBM would be at or below the levels predicted for train operations. Implementation of a vibration control plan and vibration monitoring as per PM NOI-1 would ensure station construction at the surface would not result in excessive GBV and GBN levels. Therefore, the levels and impacts shown in this table can be used for both construction and operations.
[1] As a safety factor, no building loss was assumed.
[2] A value of -5 dB can be used for K_{rad} for typical residential rooms.
dBA = A-weighted decibels; GBN = ground-borne noise; GBV = ground-borne vibration; K_{rad} = radiation factor; VdB = vibration decibels

TABLE 3.14-21. KNE SAN VICENTE–FAIRFAX ALIGNMENT PREDICTED VIBRATION LEVELS AT FTA CATEGORY 2 RESIDENTIAL LAND USES

CITY	RESIDENTIAL ADDRESS	PREDICTED GBV[1]	FTA GBV CRITERIA (VdB)	GBV EXCEEDANCE (Y/N)	PREDICTED GBN[2]	FTA GBN CRITERIA (dBA)	GBN EXCEEDANCE (Y/N)
Los Angeles	2300 S Victoria Ave	52	72	N	28	35	N
Los Angeles	2207 S Victoria Ave	50	72	N	23	35	N
Los Angeles	2026 Wellington Road	49	72	N	21	35	N
Los Angeles	1945 Wellington Road	49	72	N	21	35	N
Los Angeles	1864 Virginia Road	49	72	N	20	35	N
Los Angeles	1823 Virginia Road	49	72	N	20	35	N
Los Angeles	1734 Buckingham Road	49	72	N	21	35	N
Los Angeles	1675 Buckingham Road	49	72	N	21	35	N
Los Angeles	1616 West Blvd	49	72	N	21	35	N
Los Angeles	W 16th Place	50	72	N	22	35	N
Los Angeles	4777 San Vicente Blvd	50	72	N	22	35	N
Los Angeles	4821 San Vicente Blvd	51	72	N	26	35	N
Los Angeles	1299 S Highland Ave	50	72	N	23	35	N
Los Angeles	1301 S Highland Ave	50	72	N	22	35	N
Los Angeles	1300 S Mansfield Ave	53	72	N	30	35	N
Los Angeles	5111 San Vicente Blvd	49	72	N	21	35	N
Los Angeles	5104 San Vicente Blvd	49	72	N	21	35	N
Los Angeles	1248 Redondo Blvd	49	72	N	21	35	N
Los Angeles	1252 Redondo Blvd	49	72	N	20	35	N
Los Angeles	5253 San Vicente Blvd	49	72	N	21	35	N
Los Angeles	1255 Meadowbrook Ave	49	72	N	20	35	N
Los Angeles	5315 San Vicente Blvd	49	72	N	20	35	N
Los Angeles	5322 San Vicente Blvd	49	72	N	21	35	N
Los Angeles	5404 San Vicente Blvd	49	72	N	21	35	N

CITY	RESIDENTIAL ADDRESS	PREDICTED GBV[1]	FTA GBV CRITERIA (VdB)	GBV EXCEEDANCE (Y/N)	PREDICTED GBN[2]	FTA GBN CRITERIA (dBA)	GBN EXCEEDANCE (Y/N)
Los Angeles	5415 San Vicente Blvd	49	72	N	21	35	N
Los Angeles	5455 San Vicente Blvd	49	72	N	21	35	N
Los Angeles	5470 San Vicente Blvd	49	72	N	21	35	N
Los Angeles	1128 Masselin Ave	50	72	N	22	35	N
Los Angeles	1109 Masselin Ave	50	72	N	22	35	N
Los Angeles	1040 S Curson Ave	49	72	N	21	35	N
Los Angeles	1007 S Stanley Ave	49	72	N	21	35	N
Los Angeles	915 S Spaulding Ave	50	72	N	23	35	N
Los Angeles	847 S Genesee Ave	51	72	N	25	35	N
Los Angeles	754 S Orange Grove Ave	50	72	N	23	35	N
Los Angeles	530 S Fairfax Ave	60	72	N	32	35	N
Los Angeles	119 N Fairfax Ave	51	72	N	26	35	N
Los Angeles	140 N Hayworth Ave	52	72	N	28	35	N
Los Angeles	925 N Hayworth Ave	54	72	N	32	35	N
West Hollywood	8700 Bonner Drive	53	72	N	30	35	N
West Hollywood	354 N Sherbourne Drive	54	72	N	32	35	N
West Hollywood	404 N Sherbourne Drive	54	72	N	32	35	N
West Hollywood	8703 Ashcroft Avenue	54	72	N	32	35	N
West Hollywood	528 N San Vicente Blvd	54	72	N	32	35	N
West Hollywood	530 N San Vicente Blvd	50	72	N	23	35	N
West Hollywood	8755 Santa Monica Blvd	61	72	N	33	35	N

Source: Connect Los Angeles Partners 2023
Note: Vibration from the TBM would be at or below the levels predicted for train operations. Implementation of a vibration control plan and vibration monitoring as per PM NOI-1 would ensure station construction at the surface would not result in excessive GBV and GBN levels. Therefore, the levels and impacts shown in this table can be used for both construction and operations.
[1] As a safety factor, no building loss was assumed.
[2] A value of -5 dB can be used for K_{rad} for typical residential rooms.
dBA = A-weighted decibels; GBN = ground-borne noise; GBV = ground-borne vibration; K_{rad} = radiation factor; VdB = vibration decibels

TABLE 3.14-22. KNE SAN VICENTE–FAIRFAX ALIGNMENT PREDICTED VIBRATION LEVELS AT FTA CATEGORY 3 INSTITUTIONAL LAND USES

CITY	BUILDING ADDRESS	PREDICTED GBV[1]	FTA GBV CRITERIA (VdB)	GBV EXCEEDANCE (Y/N)	PREDICTED GBN[2]	FTA GBN CRITERIA (dBA)	GBN EXCEEDANCE (Y/N)
Los Angeles	West Angeles Church of God 3602 Crenshaw Blvd	49	75	N	20	40	N
Los Angeles	West Angeles Church of God 3045 Crenshaw Blvd	52	75	N	28	40	N
Los Angeles	West Angeles Christian Academy 3000 Crenshaw Blvd	53	75	N	30	40	N
Los Angeles	Complete Eye Care Center 2825 Crenshaw Blvd	57	75	N	33	40	N
Los Angeles	Neighborhood Office Commercial 5601 San Vicente Blvd	50	75	N	22	40	N
Los Angeles	Peterson Automotive Museum 6060 Wilshire Blvd	50	75	N	23	40	N
Los Angeles	Academy Museum of Motion Pictures 6067 Wilshire Blvd	49	75	N	21	40	N
Los Angeles	Hancock Park Elementary School 408 S Fairfax Ave	51	75	N	26	40	N
Los Angeles	Laurel Span School 925 N Hayworth Ave	50	75	N	23	40	N
Los Angeles	Short Story Hotel 15 S Fairfax Ave	57	75	N	33	40	N
Los Angeles	Modern Animal Hospital 8126 Beverly Blvd	51	75	N	26	40	N
Los Angeles	Sofitel Los Angeles at Beverly Hills 8555 Beverly Blvd	54	75	N	32	40	N
Los Angeles	Cedars-Sinai Medical Center 8700 Beverly Blvd	50	75	N	22	40	N
West Hollywood	West Hollywood Library 625 N San Vicente Blvd	53	75	N	30	40	N

CITY	BUILDING ADDRESS	PREDICTED GBV[1]	FTA GBV CRITERIA (VdB)	GBV EXCEEDANCE (Y/N)	PREDICTED GBN[2]	FTA GBN CRITERIA (dBA)	GBN EXCEEDANCE (Y/N)
West Hollywood	Ramada Plaza 8585 Santa Monica Blvd	51	75	N	26	40	N
West Hollywood	Avalon West Hollywood – Mixed Use/Multifamily, 7136 Santa Monica Blvd	52	75	N	28	40	N
West Hollywood	Domain – Mixed Use/Multifamily 7141 Santa Monica Blvd	53	75	N	30	40	N
West Hollywood	The Dylan – Mixed Use/Multifamily 7111 Santa Monica Blvd	53	75	N	30	40	N
Los Angeles	The Highland, 1411 N Highland Ave	52	75	N	28	40	N
Los Angeles	Modera Hollywood – Mixed Use/Multifamily 6775 Selma Ave	61	75	N	35	40	N
Los Angeles	1724 Highland Avenue – Mixed Use/Multifamily	59	75	N	31	40	N

Source: Connect Los Angeles Partners 2023
Note: Vibration from the TBM would be at or below the levels predicted for train operations. Implementation of a vibration control plan and vibration monitoring as per PM NOI-1 would ensure station construction at the surface would not result in excessive GBV and GBN levels. Therefore, the levels and impacts shown in this table can be used for both construction and operations.
[1] As a safety factor, no building loss was assumed.
[2] A value of -5 dB can be used for K_{rad} for typical residential rooms.
dBA = A-weighted decibels; GBN = ground-borne noise; GBV = ground-borne vibration; K_{rad} = radiation factor; VdB = vibration decibels

3.14.7.2.2 KNE FAIRFAX ALIGNMENT

3.14.7.2.2.1 CONSTRUCTION IMPACTS

Less than Significant Impact. During construction, GBV and GBN would be of concern primarily in the tunnel phase. As such, the study of potential GBV and GBN construction impacts focuses on the underground alignments. Potential GBV and GBN impacts could also occur in the early stages of the cut-and-cover alignment construction and during aboveground station construction activities, but this would depend on the method of construction that the contractor chooses to use.

The predicted GBV and GBN at sensitive receivers in the RSA above the underground portions of the KNE Fairfax Alignment are presented in Table 3.14-23 for FTA Special Buildings, Table 3.14-24 for FTA Category 2 residential land uses, and Table 3.14-25 for FTA Category 3 institutional land uses.[2] Project measure PM NOI-1 would be implemented to protect any Category 1 or 3 land uses, historic buildings, and historic non-building structures from damage during construction. Project measure PM NOI-2 would also be implemented to ensure that at a later stage of design, once a preferred alignment is selected, an FTA Detailed Vibration Assessment would be conducted to further analyze vibration impacts. As a result, the predicted GBV and GBN at sensitive receivers above the underground portions of the alignment would not exceed FTA impact criteria.

Construction of the tunnel would be mostly underground. Vibration from the tunnel boring machine would be at or below the levels predicted for light rail vehicle operations. Implementation of a vibration control plan and vibration monitoring as per project measure PM NOI-1 would ensure station construction at the surface would not result in excessive GBV and GBN levels. The vibration generated by the tunnel boring machine would be temporary, lasting for a few days as it passes under the different receiver locations. Therefore, the KNE Fairfax Alignment would have a less than significant impact during construction.

3.14.7.2.2.2 OPERATIONAL IMPACTS

Less than Significant Impact. Operation of the KNE Fairfax Alignment would also occur primarily underground, which is the only potential source of GBV and GBN impacts from light rail vehicle operations. Light rail vehicles moving through the stations would be the concern for operational vibration impacts at the station locations. The only operational activity that would not be underground is people entering and exiting the station, which has no risk of GBV or GBN impacts. However, because borehole line source response testing was not conducted as part of this assessment, the theaters and performing arts spaces identified as FTA Special Buildings would require further study as part of final design.

While there are FTA Special Buildings, Category 2 residential land uses, and Category 3 institutional land uses in the KNE Fairfax Alignment RSA, as shown in Table 3.14-23, Table 3.14-24, and Table 3.14-25, the predicted GBV and GBN at sensitive receivers in the RSA would not exceed FTA impact criteria. Therefore, the KNE Fairfax Alignment would have a less than significant impact during operation.

[2] For this analysis, the Academy Museum of Motion Pictures is considered a Category 3 land use due to its usage as a movie theater.

TABLE 3.14-23. KNE FAIRFAX ALIGNMENT PREDICTED VIBRATION LEVELS AT FTA SPECIAL BUILDINGS

CITY	BUILDING ADDRESS	PREDICTED GBV[1]	FTA GBV CRITERIA (VdB)	GBV EXCEEDANCE (Y/N)	PREDICTED GBN[2]	FTA GBN CRITERIA (dBA)	GBN EXCEEDANCE (Y/N)
Los Angeles	West Angeles Performing Arts, 3020 Crenshaw Blvd	53	72	N	30	35	N
West Hollywood	Education/Lee Strasberg Theatre, 7936 Santa Monica Blvd	53	75	N	30	40	N
Los Angeles	Hollywood High School Theater, 1521 N Highland Ave	60	72	N	33	35	N

Source: Connect Los Angeles Partners 2023
Note: Vibration from the TBM would be at or below the levels predicted for train operations. Implementation of a vibration control plan and vibration monitoring as per PM NOI-1 would ensure station construction at the surface would not result in excessive GBV and GBN levels. Therefore, the levels and impacts shown in this table can be used for both construction and operations.
[1] As a safety factor, no building loss was assumed.
[2] A value of -5 dB can be used for K_{rad} for typical residential rooms.
dBA = A-weighted decibels; GBN = ground-borne noise; GBV = ground-borne vibration; K_{rad} = radiation factor; VdB = vibration decibels

TABLE 3.14-24. KNE FAIRFAX ALIGNMENT PREDICTED VIBRATION LEVELS AT FTA CATEGORY 2 RESIDENTIAL LAND USES

CITY	BUILDING ADDRESS	PREDICTED GBV[1]	FTA GBV CRITERIA (VdB)	GBV EXCEEDANCE (Y/N)	PREDICTED GBN[2]	FTA GBN CRITERIA (dBA)	GBN EXCEEDANCE (Y/N)
Los Angeles	2300 S Victoria Ave	52	72	N	28	35	N
Los Angeles	2207 S Victoria Ave	50	72	N	23	35	N
Los Angeles	2026 Wellington Road	49	72	N	21	35	N
Los Angeles	1945 Wellington Road	49	72	N	21	35	N
Los Angeles	1864 Virginia Road	49	72	N	20	35	N
Los Angeles	1823 Virginia Road	49	72	N	20	35	N
Los Angeles	1734 Buckingham Road	49	72	N	21	35	N
Los Angeles	1675 Buckingham Road	49	72	N	21	35	N
Los Angeles	1616 West Blvd	49	72	N	21	35	N
Los Angeles	W 16th Place	50	72	N	22	35	N
Los Angeles	4777 San Vicente Blvd	50	72	N	22	35	N
Los Angeles	4821 San Vicente Blvd	51	72	N	26	35	N
Los Angeles	1299 S Highland Ave	50	72	N	23	35	N
Los Angeles	1301 S Highland Ave	50	72	N	22	35	N
Los Angeles	1300 S Mansfield Ave	51	72	N	25	35	N
Los Angeles	5111 San Vicente Blvd	49	72	N	21	35	N
Los Angeles	5104 San Vicente Blvd	49	72	N	21	35	N
Los Angeles	1248 Redondo Blvd	49	72	N	21	35	N
Los Angeles	1252 Redondo Blvd	49	72	N	20	35	N
Los Angeles	5253 San Vicente Blvd	49	72	N	21	35	N
Los Angeles	1255 Meadowbrook Ave	49	72	N	20	35	N
Los Angeles	5315 San Vicente Blvd	49	72	N	21	35	N
Los Angeles	5322 San Vicente Blvd	49	72	N	21	35	N

CITY	BUILDING ADDRESS	PREDICTED GBV[1]	FTA GBV CRITERIA (VdB)	GBV EXCEEDANCE (Y/N)	PREDICTED GBN[2]	FTA GBN CRITERIA (dBA)	GBN EXCEEDANCE (Y/N)
Los Angeles	5404 San Vicente Blvd	49	72	N	21	35	N
Los Angeles	5415 San Vicente Blvd	49	72	N	21	35	N
Los Angeles	5455 San Vicente Blvd	49	72	N	21	35	N
Los Angeles	5470 San Vicente Blvd	49	72	N	20	35	N
Los Angeles	1128 Masselin Ave	50	72	N	22	35	N
Los Angeles	1109 Masselin Ave	50	72	N	22	35	N
Los Angeles	1040 S Curson Ave	50	72	N	22	35	N
Los Angeles	1255 Meadowbrook Ave	49	72	N	21	35	N
Los Angeles	1007 S Stanley Ave	49	72	N	21	35	N
Los Angeles	915 S Spaulding Ave	50	72	N	23	35	N
Los Angeles	847 S Genesee Ave	51	72	N	25	35	N
Los Angeles	754 S Orange Grove Ave	50	72	N	23	35	N
Los Angeles	530 S Fairfax Ave	60	72	N	32	35	N
Los Angeles	751 N Fairfax Ave	52	72	N	28	35	N
Los Angeles	812 N Hayworth Ave	53	72	N	30	35	N
Los Angeles	839 N Hayworth Ave	53	72	N	30	35	N
Los Angeles	925 N Hayworth Ave	54	72	N	32	35	N
Los Angeles	801 Romaine St	53	72	N	30	35	N
West Hollywood	105 N Edinburgh Ave	52	72	N	28	35	N

Source: Connect Los Angeles Partners 2023

Note: Vibration from the TBM would be at or below the levels predicted for train operations. Implementation of a vibration control plan and vibration monitoring as per PM NOI-1 would ensure station construction at the surface would not result in excessive GBV and GBN levels. Therefore, the levels and impacts shown in this table can be used for both construction and operations.

[1] As a safety factor, no building loss was assumed.

[2] A value of -5 dB can be used for K_{rad} for typical residential rooms.

dBA = A-weighted decibels; GBN = ground-borne noise; GBV = ground-borne vibration; K_{rad} = radiation factor; VdB = vibration decibels

TABLE 3.14-25. KNE FAIRFAX ALIGNMENT PREDICTED VIBRATION LEVELS AT FTA CATEGORY 3 INSTITUTIONAL LAND USES

CITY	BUILDING ADDRESS	PREDICTED GBV[1]	FTA GBV CRITERIA (VdB)	GBV EXCEEDANCE (Y/N)	PREDICTED GBN[2]	FTA GBN CRITERIA (dBA)	GBN EXCEEDANCE (Y/N)
Los Angeles	West Angeles Church of God 3602 Crenshaw Blvd	49	75	N	20	40	N
Los Angeles	West Angeles Church of God 3045 Crenshaw Blvd	52	75	N	28	40	N
Los Angeles	West Angeles Christian Academy 3000 Crenshaw Blvd	53	75	N	30	40	N
Los Angeles	Complete Eye Care Center 2825 Crenshaw Blvd	57	75	N	33	40	N
Los Angeles	Peterson Automotive Museum 6060 Wilshire Blvd	50	75	N	23	40	N
Los Angeles	Academy Museum of Motion Pictures 6067 Wilshire Blvd	49	75	N	21	40	N
Los Angeles	Hancock Park Elementary School, 408 S Fairfax Avenue	51	75	N	26	40	N
Los Angeles	Short Story Hotel 115 S Fairfax Avenue	57	75	N	33	40	N
Los Angeles	Baba Sale Congregation 404 N Fairfax Ave	52	75	N	28	40	N
Los Angeles	Greenway Court Theatre/Fairfax High School, 7850 Melrose Ave	52	75	N	28	40	N
Los Angeles	Fairfax High School 7850 Melrose Ave	48	75	N	19	40	N
Los Angeles	Laurel Span School 925 N Hayworth Ave	50	75	N	23	40	N
West Hollywood	Avalon West Hollywood – Mixed Use/Multifamily 7136 Santa Monica Blvd	52	75	N	28	40	N

CITY	BUILDING ADDRESS	PREDICTED GBV[1]	FTA GBV CRITERIA (VdB)	GBV EXCEEDANCE (Y/N)	PREDICTED GBN[2]	FTA GBN CRITERIA (dBA)	GBN EXCEEDANCE (Y/N)
West Hollywood	Domain – Mixed Use/Multifamily 7141 Santa Monica Blvd	53	75	N	30	40	N
West Hollywood	The Dylan – Mixed Use/Multifamily 7111 Santa Monica Blvd	53	75	N	30	40	N
Los Angeles	The Highland – Mixed Use/Multifamily 1411 N Highland Ave	52	75	N	28	40	N
Los Angeles	Modera Hollywood – Mixed Use/Multifamily 6775 Selma Ave	61	75	N	35	40	N
Los Angeles	1724 Highland Avenue – Mixed Use/Multifamily	59	75	N	31	40	N

Source: Connect Los Angeles Partners 2023
Note: Vibration from the TBM would be at or below the levels predicted for train operations. Implementation of a vibration control plan and vibration monitoring as per PM NOI-1 would ensure station construction at the surface would not result in excessive GBV and GBN levels. Therefore, the levels and impacts shown in this table can be used for both construction and operations.
[2] A value of -5 dB can be used for K_{rad} for typical residential rooms.
[3] As a safety factor, no building loss was assumed.
dBA = A-weighted decibels; GBN = ground-borne noise; GBV = ground-borne vibration; K_{rad} = radiation factor; VdB = vibration decibels

3.14.7.2.3 KNE LA BREA ALIGNMENT

3.14.7.2.3.1 CONSTRUCTION IMPACTS

Less than Significant Impact. During construction, GBV and GBN would be of concern primarily in the tunnel phase. As such, the study of potential GBV and GBN construction impacts focuses on the underground alignments. Potential GBV and GBN impacts could also occur in the early stages of the cut-and-cover alignment construction and during aboveground station construction activities, but this would depend on the method of construction that the contractor chooses to use.

The predicted GBV and GBN at sensitive receivers in the RSA above the underground portions of the KNE La Brea Alignment are presented in Table 3.14-26 for FTA Special Buildings, Table 3.14-27 for FTA Category 2 residential land uses, and Table 3.14-28 for FTA Category 3 institutional land uses. Project measure PM NOI-1 would be implemented to protect any Category 1 or 3 land uses, historic buildings, and historic non-building structures from damage during construction. Project measure PM NOI-2 would also be implemented to ensure that at a later stage of design, once a preferred alignment is selected, an FTA Detailed Vibration Assessment would be conducted to further analyze vibration impacts. As a result, the predicted GBV and GBN at sensitive receivers above the underground portions of the alignment would not exceed FTA impact criteria.

Construction of the tunnel would be mostly underground. Vibration from the tunnel boring machine would be at or below the levels predicted for light rail vehicle operations. Implementation of a vibration control plan and vibration monitoring as per project measure PM NOI-1 would ensure station construction at the surface would not result in excessive GBV and GBN levels. The vibration generated by the tunnel boring machine would be temporary, lasting for a few days as it passes under the different receiver locations. Therefore, the KNE La Brea Alignment would have a less than significant impact during construction.

3.14.7.2.3.2 OPERATIONAL IMPACTS

Less than Significant Impact. Operation of the KNE La Brea Alignment would also occur primarily underground, which is the only potential source of GBV and GBN impacts from light rail vehicle operations. Light rail vehicles moving through the stations would be the concern for operational vibration impacts at the station locations. The only operational activity that would not be underground is people entering and exiting the station, which has no risk of GBV or GBN impacts. However, because borehole line source response testing was not conducted as part of this assessment, the theaters and performing arts spaces identified as FTA Special Buildings would require further study as part of final design.

While there are FTA Special Buildings, Category 2 residential land uses, and Category 3 institutional land uses in the KNE La Brea Alignment RSA, as shown in Table 3.14-26, Table 3.14-27, and Table 3.14-28, the predicted GBV and GBN at sensitive receivers in the RSA would not exceed FTA impact criteria. Therefore, the KNE La Brea Alignment would have a less than significant impact during operation.

TABLE 3.14-26. KNE LA BREA ALIGNMENT PREDICTED VIBRATION LEVELS AT FTA SPECIAL BUILDINGS

CITY	BUILDING ADDRESS	PREDICTED GBV[1]	FTA GBV CRITERIA (VdB)	GBV EXCEEDANCE (Y/N)	PREDICTED GBN[2]	FTA GBN CRITERIA (dBA)	GBN EXCEEDANCE (Y/N)
Los Angeles	West Angeles Performing Arts Theatre 3020 Crenshaw Blvd	53	72	N	30	35	N
Los Angeles	Hollywood High School Theater 1521 N Highland Ave	60	72	N	33	35	N

Source: Connect Los Angeles Partners 2023
Note: Vibration from the TBM would be at or below the levels predicted for train operations. Implementation of a vibration control plan and vibration monitoring as per PM NOI-1 would ensure station construction at the surface would not result in excessive GBV and GBN levels. Therefore, the levels and impacts shown in this table can be used for both construction and operations.
[1] As a safety factor, no building loss was assumed.
[2] A value of -5 dB can be used for K_{rad} for typical residential rooms.
dBA = A-weighted decibels; GBN = ground-borne noise; GBV = ground-borne vibration; K_{rad} = radiation factor; VdB = vibration decibels

TABLE 3.14-27. KNE LA BREA ALIGNMENT PREDICTED VIBRATION LEVELS AT FTA CATEGORY 2 RESIDENTIAL LAND USES

CITY	BUILDING ADDRESS	PREDICTED GBV[1]	FTA GBV CRITERIA (VdB)	GBV EXCEEDANCE (Y/N)	PREDICTED GBN[2]	FTA GBN CRITERIA (dBA)	GBN EXCEEDANCE (Y/N)
Los Angeles	2300 S Victoria Ave	52	72	N	28	35	N
Los Angeles	2207 S Victoria Ave	50	72	N	23	35	N
Los Angeles	2026 Wellington Road	49	72	N	21	35	N
Los Angeles	1945 Wellington Road	49	72	N	20	35	N
Los Angeles	1864 Virginia Road	49	72	N	20	35	N
Los Angeles	1823 Virginia Road	49	72	N	20	35	N
Los Angeles	1734 Buckingham Road	49	72	N	21	35	N
Los Angeles	1675 Buckingham Road	49	72	N	21	35	N
Los Angeles	1616 West Blvd	50	72	N	22	35	N
Los Angeles	W 16th Place	50	72	N	22	35	N

CITY	BUILDING ADDRESS	PREDICTED GBV[1]	FTA GBV CRITERIA (VdB)	GBV EXCEEDANCE (Y/N)	PREDICTED GBN[2]	FTA GBN CRITERIA (dBA)	GBN EXCEEDANCE (Y/N)
Los Angeles	4777 San Vicente Blvd	50	72	N	23	35	N
Los Angeles	4821 San Vicente Blvd	51	72	N	26	35	N
Los Angeles	1299 S Highland Ave	50	72	N	23	35	N
Los Angeles	1301 S Highland Ave	50	72	N	22	35	N
Los Angeles	1264 S Orange Drive	50	72	N	23	35	N
Los Angeles	1249 S Orange Drive	50	72	N	22	35	N
Los Angeles	1214 S Sycamore Ave	50	72	N	23	35	N
Los Angeles	1112 S Redondo Blvd	50	72	N	23	35	N
Los Angeles	1059 Redondo Blvd	50	72	N	23	35	N
West Hollywood	1234 N La Brea Ave	52	72	N	28	35	N
West Hollywood	1255 N Sycamore Ave	51	72	N	26	35	N
Los Angeles	1306 N Sycamore Ave	51	72	N	26	35	N
Los Angeles	1327 N Mansfield Ave	52	72	N	28	35	N
Los Angeles	1343 N Citrus Ave	52	72	N	28	35	N
Los Angeles	1352 N Citrus Ave	53	72	N	30	35	N

Source: Connect Los Angeles Partners 2023
Note: Vibration from the TBM would be at or below the levels predicted for train operations. Implementation of a vibration control plan and vibration monitoring as per PM NOI-1 would ensure station construction at the surface would not result in excessive GBV and GBN levels. Therefore, the levels and impacts shown in this table can be used for both construction and operations.
[1] As a safety factor, no building loss was assumed.
[2] A value of -5 dB can be used for K_{rad} for typical residential rooms.
dBA = A-weighted decibels; GBN = ground-borne noise; GBV = ground-borne vibration; K_{rad} = radiation factor; VdB = vibration decibels

TABLE 3.14-28. KNE LA BREA ALIGNMENT PREDICTED VIBRATION LEVELS AT FTA CATEGORY 3 INSTITUTIONAL LAND USES

CITY	BUILDING ADDRESS	PREDICTED GBV[1]	FTA GBV CRITERIA (VdB)	GBV EXCEEDANCE (Y/N)	PREDICTED GBN[2]	FTA GBN CRITERIA (dBA)	GBN EXCEEDANCE (Y/N)
Los Angeles	West Angeles Church of God 3602 Crenshaw Blvd	49	75	N	20	40	N
Los Angeles	West Angeles Church of God 3045 Crenshaw Blvd	51	75	N	26	40	N
Los Angeles	West Angeles Christian Academy 3000 Crenshaw Blvd	53	75	N	30	40	N
Los Angeles	Complete Eye Care Center 2825 Crenshaw Blvd	57	75	N	33	40	N
Los Angeles	Cathedral Chapel of St Vibiana 923 S La Brea Ave	50	75	N	22	40	N
Los Angeles	Iglesia Cristiana Leon De Juda 847 S La Bera Ave	50	75	N	23	40	N
Los Angeles	Wilshire La Brea, 5200 Wilshire Blvd	60	75	N	33	40	N
Los Angeles	La Brea Compassionate Caregivers 735 S La Brea	55	75	N	28	40	N
Los Angeles	La Art, 217 S La Brea Ave	50	75	N	23	40	N
Los Angeles	Education, 132 S La Brea Ave	52	75	N	28	40	N
Los Angeles	Bnos Esther, 116 N La Brea Ave	52	75	N	28	40	N
Los Angeles	UCLA Health MPTF 335 N La Brea Ave	57	75	N	33	40	N
Los Angeles	Education, 330 N La Brea Ave	52	75	N	28	40	N
Los Angeles	Congregation Levi Yitzchok 356 N La Brea Ave	62	75	N	38	40	N
Los Angeles	The Rehabilitation Center 501 N La Brea Ave	51	75	N	26	40	N

CITY	BUILDING ADDRESS	PREDICTED GBV[1]	FTA GBV CRITERIA (VdB)	GBV EXCEEDANCE (Y/N)	PREDICTED GBN[2]	FTA GBN CRITERIA (dBA)	GBN EXCEEDANCE (Y/N)
Los Angeles	Yeshiva Rav Isacsohn 540 N La Brea Ave	51	75	N	26	40	N
Los Angeles	Yeshiva Rav Isacsohn 555 N La Brea Ave	51	75	N	25	40	N
Los Angeles	The Hole, 844 N La Brea Ave	52	75	N	28	40	N
Los Angeles	Angelene WeHo 915 N La Brea Ave	51	75	N	26	40	N
Los Angeles	Prizmal, 904 N La Brea Ave	51	75	N	26	40	N
West Hollywood	The Dylan 7111 Santa Monica Blvd	51	75	N	26	40	N
West Hollywood	1145 N La Brea Ave	51	75	N	26	40	N
West Hollywood	Hollywood Cat and Dog Hospital 1150 N La Brea Ave	51	75	N	25	40	N
West Hollywood	Congregation Kol Ami 1200 N La Brea Ave	52	75	N	28	40	N
Los Angeles	The Highland 1411 N Highland Ave – Mixed Use/Multifamily	53	75	N	30	40	N
Los Angeles	Modera Hollywood 6775 Selma Ave – Mixed Use/Multifamily	64	75	N	30	40	N
Los Angeles	1724 Highland – Mixed Use/Multifamily	59	75	N	31	40	N

Source: Connect Los Angeles Partners 2023
Note: Vibration from the TBM would be at or below the levels predicted for train operations. Implementation of a vibration control plan and vibration monitoring as per PM NOI-1 would ensure station construction at the surface would not result in excessive GBV and GBN levels. Therefore, the levels and impacts shown in this table can be used for both construction and operations.
[1] As a safety factor, no building loss was assumed.
[2] A value of -5 dB can be used for K_{rad} for typical residential rooms.
dBA = A-weighted decibels; GBN = ground-borne noise; GBV = ground-borne vibration; K_{rad} = radiation factor; VdB = vibration decibels

3.14.7.2.4 HOLLYWOOD BOWL DESIGN OPTION

3.14.7.2.4.1 CONSTRUCTION IMPACTS

No Impact. During construction, GBV and GBN would be of concern primarily in the tunnel phase. As such, the study of potential GBV and GBN construction impacts focuses on the underground alignments. Potential GBV and GBN impacts could also occur in the early stages of the cut-and-cover alignment construction and during aboveground station construction activities, but this would depend on the method of construction that the contractor chooses to use.

The predicted GBV and GBN at sensitive receivers in the RSA above the underground portions of the Hollywood Bowl Design Option are presented in Table 3.14-29 for FTA Category 2 residential land uses. There are no FTA Special Buildings or FTA Category 3 institutional land uses in the design option RSA. As shown in the table, none of the FTA GBV and GBN impact criteria would be exceeded at the identified land uses.

Construction of the tunnel would be mostly underground. Vibration from construction activities associated with the sequential excavation method would be at or below the levels predicted for light rail vehicle operations. Implementation of a vibration control plan and vibration monitoring as per project measure PM NOI-1 would ensure station construction at the surface would not result in excessive GBV and GBN levels. The vibration generated by the sequential excavation method would be temporary, lasting for a few days as it passes under the different receiver locations. Therefore, the Hollywood Bowl Design Option would have no impact during construction.

3.14.7.2.4.2 OPERATIONAL IMPACTS

No Impact. Operation of the Hollywood Bowl Design Option would also occur primarily underground, which is the only potential source of GBV and GBN impacts from light rail vehicle operations. Light rail vehicles moving through the stations would be the concern for operational vibration impacts at the station locations. The only operational activity that would not be underground is people entering and exiting the station, which has no risk of GBV or GBN impacts.

The predicted GBV and GBN at sensitive receivers in the RSA above the Hollywood Bowl Design Option are presented in Table 3.14-29. There are no FTA Special Buildings or FTA Category 3 institutional land uses in the RSA. As shown in the table, none of the FTA GBV and GBN impact criteria would be exceeded during operation of the design option. Therefore, the Hollywood Bowl Design Option would have no impact during operation.

TABLE 3.14-29. HOLLYWOOD BOWL DESIGN OPTION PREDICTED VIBRATION LEVELS AT FTA CATEGORY 2 RESIDENTIAL LAND USES

CITY	BUILDING ADDRESS	PREDICTED GBV[1]	FTA GBV CRITERIA (VdB)	GBV EXCEEDANCE (Y/N)	PREDICTED GBN[2]	FTA GBN CRITERIA (dBA)	GBN EXCEEDANCE (Y/N)
Los Angeles	1921 N Highland Ave	52	72	N	28	35	N
Los Angeles	1940 N Highland Ave	53	72	N	30	35	N

Source: Connect Los Angeles Partners 2023
Note: Vibration from sequential excavation method would be at or below the levels predicted for train operations. Implementation of a vibration control plan and vibration monitoring as per PM NOI-1 would ensure station construction at the surface would not result in excessive GBV and GBN levels. Therefore, the levels and impacts shown in this table can be used for both construction and operations.
[1] As a safety factor, no building loss was assumed.
[2] A value of -5 dB can be used for K_{rad} for typical residential rooms.
dBA = A-weighted decibels; GBN = ground-borne noise; GBV = ground-borne vibration; K_{rad} = radiation factor; VdB = vibration decibels

3.14.7.2.5 MAINTENANCE AND STORAGE FACILITY

3.14.7.2.5.1 CONSTRUCTION IMPACTS

No Impact. Construction of the MSF would require construction equipment and movement of soil. The nearest vibration-sensitive land use to the MSF is more than 200 feet from the MSF. At that distance, vibration levels would not exceed FTA GBV and GBN impact criteria. Therefore, the MSF would have no impact during construction.

3.14.7.2.5.2 OPERATIONAL IMPACTS

No Impact. Operational activities at the MSF would involve the movement of light rail vehicles. There would also be special trackwork in the yard to allow the light rail vehicles to be moved between storage tracks. The nearest vibration-sensitive land use to the MSF is more than 200 feet from the MSF. At that distance, vibration levels would not exceed FTA GBV and GBN impact criteria. Therefore, the MSF would have no impact during operation.

3.14.7.3 IMPACT NOI-3: AIRPORT NOISE

Impact NOI-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?

3.14.7.3.1 KNE SAN VICENTE–FAIRFAX ALIGNMENT

3.14.7.3.1.1 CONSTRUCTION IMPACTS

No Impact. The KNE San Vicente–Fairfax Alignment would not be located within two miles of a private airstrip, airport land use plan, or public airport. The closest airport or airstrip is the Santa Monica Airport, located 5.4 miles southwest of the alignment. LAX is located six miles from the southern extent of the alignment. Construction of the KNE San Vicente–Fairfax Alignment would not expose people residing or working in the RSA to excessive noise levels. Therefore, the KNE San Vicente–Fairfax Alignment would have no impact during construction.

3.14.7.3.1.2 OPERATIONAL IMPACTS

No Impact. The KNE San Vicente–Fairfax Alignment would not be located within two miles of a private airstrip, airport land use plan, or public airport. The closest airport or airstrip is the Santa Monica Airport, located 5.4 miles southwest of the alignment. LAX is located six miles from the southern extent of the alignment. Operation of the KNE San Vicente–Fairfax Alignment would not expose people residing or working in the RSA to excessive noise levels. Therefore, the KNE San Vicente–Fairfax Alignment would have no impact during operation.

3.14.7.3.2 KNE FAIRFAX ALIGNMENT

3.14.7.3.2.1 CONSTRUCTION IMPACTS

No Impact. The KNE Fairfax Alignment would not be located within two miles of a private airstrip, airport land use plan, or public airport. The closest airport or airstrip is the Santa Monica Airport, located 5.5 miles southwest of the alignment. LAX is located six miles from the southern extent of the alignment. Construction of the KNE Fairfax Alignment would not expose people residing or working in the RSA to excessive noise levels. Therefore, the KNE Fairfax Alignment would have no impact during construction.

3.14.7.3.2.2 OPERATIONAL IMPACTS

No Impact. The KNE Fairfax Alignment would not be located within two miles of a private airstrip, airport land use plan, or public airport. The closest airport or airstrip is the Santa Monica Airport, located 5.5 miles southwest of the alignment. LAX is located six miles from the southern extent of the alignment. Operation of the KNE Fairfax Alignment would not expose people residing or working in the RSA to excessive noise levels. Therefore, the KNE Fairfax Alignment would have no impact during operation.

3.14.7.3.3 KNE LA BREA ALIGNMENT

3.14.7.3.3.1 CONSTRUCTION IMPACTS

No Impact. The KNE La Brea Alignment would not be located within two miles of a private airstrip, airport land use plan, or public airport. The closest airport or airstrip is the Santa Monica Airport, located 6 miles southwest of the alignment. LAX is located six miles from the southern extent of the alignment. Construction of the KNE La Brea Alignment would not expose people residing or working in the RSA to excessive noise levels. Therefore, the KNE La Brea Alignment would have no impact during construction.

3.14.7.3.3.2 OPERATIONAL IMPACTS

No Impact. The KNE La Brea Alignment would not be located within two miles of a private airstrip, airport land use plan, or public airport. The closest airport or airstrip is the Santa Monica Airport, located 6 miles southwest of the alignment. LAX is located six miles from the southern extent of the alignment. Operation of the KNE La Brea Alignment would not expose people residing or working in the RSA to excessive noise levels. Therefore, the KNE La Brea Alignment would have no impact during operation.

3.14.7.3.4 HOLLYWOOD BOWL DESIGN OPTION

3.14.7.3.4.1 CONSTRUCTION IMPACTS

No Impact. The Hollywood Bowl Design Option would not be located within two miles of a private airstrip, airport land use plan, or public airport. The closest airport or airstrip is the Hollywood Burbank Airport, located 5.8 miles northeast of the design option, and LAX is located 12 miles away. Construction of the design option would not expose people residing or working in the RSA to excessive noise levels. Therefore, the Hollywood Bowl Design Option would have no impact during construction.

3.14.7.3.4.2 OPERATIONAL IMPACTS

No Impact. The Hollywood Bowl Design Option would not be located within two miles of a private airstrip, airport land use plan, or public airport. The closest airport or airstrip is the Hollywood Burbank Airport, located 5.8 miles northeast of the design option, and LAX is located 12 miles away. Operation of the design option would not expose people residing or working in the RSA to excessive noise levels. Therefore, the Hollywood Bowl Design Option would have no impact during operation.

3.14.7.3.5 MAINTENANCE AND STORAGE FACILITY

3.14.7.3.5.1 CONSTRUCTION IMPACTS

Less than Significant Impact. The MSF site is within 0.5 mile of LAX. Construction of the MSF could expose people residing and working in the area to new noise sources, but because the area is located in the 65 to 70 community noise equivalent level contour for the aircraft landing path at LAX, noise from construction and operational activities associated with the MSF would add only 1 to 2 decibels to the current high noise levels in the surrounding area and would not expose people residing or working in the RSA to excessive noise levels. Therefore, the MSF would have a less than significant impact during construction.

3.14.7.3.5.2 OPERATION IMPACTS

Less than Significant Impact. The MSF site is within 0.5 mile of LAX. Operation of the MSF could expose people residing and working in the area to new noise sources, but because the area is located in the 65 to 70 community noise equivalent level contour for the aircraft landing path at LAX, noise from construction and operational activities associated with the MSF would add only 1 to 2 decibels to the current high noise levels in the surrounding area and would not expose people residing or working in the RSA to excessive noise levels. Therefore, the MSF would have a less than significant impact during operation.

3.14.7.4 MITIGATION MEASURES

The mitigation measure described below is provided to reduce significant noise and vibration impacts. Section 3.14.7.4.2 discusses the impact significance after mitigation.

3.14.7.4.1 MITIGATION MEASURE MM NOI-1: NOISE CONTROL PLAN

Prior to the initiation of construction activities, Metro's contractor shall conduct an ambient noise study and develop a Noise Control Plan demonstrating how the FTA 1-hour L_{eq} noise criteria would be achieved during construction. The Noise Control Plan shall be prepared by a board-certified acoustical engineer and would be designed to follow Metro requirements and would include measurements of existing noise, a list of the major pieces of construction equipment that would be used, and predictions of the noise levels at the closest noise-sensitive receivers (i.e., residences, hotels, schools, churches, temples, and similar facilities). The Noise Control Plan shall be approved by Metro prior to initiating construction. Where construction cannot be performed in accordance with the FTA 1-hour L_{eq} construction noise standards, the contractor

would investigate alternative construction measures that would result in lower sound levels. The applicable FTA 1-hour L_{eq} construction noise standards, as set forth in the FTA Design Manual, are as follows:

- Residential daytime standard of 90 dBA L_{eq} and nighttime standard of 80 dBA L_{eq}
- Commercial and industrial daytime standard of 100 dBA L_{eq} and nighttime standard of 100 dBA L_{eq}

The contractor shall conduct noise monitoring to demonstrate compliance with contract noise limits. The contractor shall establish a public information compliant system and contractor shall respond to and provide corrective action for noise-related complaints filed within a time period of 24-hours. In addition, Metro would comply with local noise ordinances when applicable (e.g., noise standards in City of Los Angeles Municipal Code Section 41.40 and the ambient noise level increase limit of 5 dBA in the LA City CEQA Threshold Guidelines), including by obtaining a variance(s) from the applicable local jurisdiction when nighttime work is required. Noise-reducing methods that may be implemented by Metro include:

- If nighttime construction is planned, a noise variance may be obtained by the contractor, if required by the jurisdiction, that demonstrates the implementation of control measures to maintain noise levels below the applicable FTA standards.
- Where construction occurs near noise-sensitive land uses, specialty equipment with enclosed engines, acoustically attenuating shields, and/or high-performance mufflers may be used.
- Limit unnecessary idling of equipment.
- Install temporary noise barriers or noise-control curtains, where feasible and desirable.
- Reroute construction-related truck traffic away from local residential streets and/or sensitive receivers.
- Limit impact pile driving where feasible and effective or use pre-auger pile insertion.
- Use electric instead of diesel-powered equipment and hydraulic instead of pneumatic tools where feasible.
- Minimize the use of impact devices such as jackhammers and hoe rams, using concrete crushers and pavement saws instead.

3.14.7.4.2 IMPACT SIGNIFICANCE AFTER MITIGATION

As described in Section 3.14.7.1, there would be significant impacts related to substantial temporary increases in ambient noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies (Impact NOI-1) during construction of stations associated with the KNE San Vicente–Fairfax Alignment, KNE Fairfax Alignment, KNE La Brea Alignment, and the Hollywood Bowl Design Option. The subsections below describe the impact significance for each of the alignments and the design option after implementation of mitigation.

3.14.7.4.2.1 KNE SAN VICENTE–FAIRFAX ALIGNMENT

IMPACT NOI-1: AMBIENT NOISE

For the KNE San Vicente–Fairfax Alignment, MM NOI-1 (Noise Control Plan) shall be implemented at the following eight station locations where there would be a significant impact during construction:

- Crenshaw/Adams Station
- Wilshire/Fairfax Station
- Fairfax/3rd Station
- La Cienega/Beverly Station
- San Vicente/Santa Monica Station
- Fairfax/Santa Monica Station
- La Brea/Santa Monica Station
- Hollywood/Highland Station

This mitigation measure focuses on the areas and activities relevant to aboveground construction. During construction at the Wilshire/Fairfax Station, Metro may also need to engage in additional coordination with the Academy Museum of Motion Pictures. This would allow the contractor to schedule construction so activities with greater noise or vibration levels do not occur during events at the Academy Museum of Motion Pictures.

Implementation of mitigation measure MM NOI-1 during construction of the KNE San Vicente–Fairfax Alignment would reduce increases in ambient noise to a less than significant level.

3.14.7.4.2.2 KNE FAIRFAX ALIGNMENT

IMPACT NOI-1: AMBIENT NOISE

For the KNE Fairfax Alignment, MM NOI-1 (Noise Control Plan) shall be implemented at the following six station locations where there would be a significant impact during construction:

- Crenshaw/Adams Station
- Wilshire/Fairfax Station
- Fairfax/3rd Station
- Fairfax/Santa Monica Station
- La Brea/Santa Monica Station
- Hollywood/Highland Station

This mitigation measure focuses on the areas and activities relevant to aboveground construction. During construction at the Wilshire/Fairfax Station, Metro may also need to engage in additional coordination with the Academy Museum of Motion Pictures. This would allow the contractor to schedule construction

so activities with greater noise or vibration levels do not occur during events at the Academy Museum of Motion Pictures.

Implementation of mitigation measure MM NOI-1 during construction of the KNE Fairfax Alignment would reduce increases in ambient noise to a less than significant level.

3.14.7.4.2.3 KNE LA BREA ALIGNMENT

IMPACT NOI-1: AMBIENT NOISE

For the KNE La Brea Alignment, MM NOI-1 (Noise Control Plan) shall be implemented at the following five station locations where there would be a significant impact during construction:

- Crenshaw/Adams Station
- Wilshire/La Brea Station
- La Brea/Beverly Station
- La Brea/Santa Monica Station
- Hollywood/Highland Station

This mitigation measure focuses on the areas and activities relevant to aboveground construction. Implementation of mitigation measure MM NOI-1 during construction of the KNE La Brea Alignment would reduce increases in ambient noise to a less than significant level.

3.14.7.4.2.4 HOLLYWOOD BOWL DESIGN OPTION

IMPACT NOI-1: AMBIENT NOISE

For the Hollywood Bowl Design Option, MM NOI-1 (Noise Control Plan) shall be implemented at the following station location where there would be a significant impact during construction:

- Hollywood Bowl Station

This mitigation measure focuses on the areas and activities relevant to aboveground construction. Implementation of mitigation measure MM NOI-1 during construction of the Hollywood Bowl Design Option would reduce increases in ambient noise to a less than significant level.

3.14.7.5 SUMMARY OF IMPACT SIGNIFICANCE CONCLUSIONS AND MITIGATION MEASURES

Table 3.14-30 summarizes the noise and vibration impact significance conclusions and applicable mitigation measures.

TABLE 3.14-30. KNE SUMMARY OF IMPACT SIGNIFICANCE CONCLUSIONS AND MITIGATION MEASURES

IMPACT		IMPACT SIGNIFICANCE CONCLUSIONS AND MITIGATION MEASURES				
		KNE SAN VICENTE–FAIRFAX ALIGNMENT	KNE FAIRFAX ALIGNMENT	KNE LA BREA ALIGNMENT	HOLLYWOOD BOWL DESIGN OPTION	MAINTENANCE AND STORAGE FACILITY
Impact NOI-1: Ambient Noise	Impact Before Mitigation	Construction: Significant[1] Operation: No Impact	Construction: Significant[2] Operation: No Impact	Construction: Significant[3] Operation: No Impact	Construction: Significant Operation: No Impact	Construction: No Impact Operation: No Impact
	Mitigation Measures	Construction: MM NOI-1 Operation: None Required	Construction: MM NOI-1 Operation: None Required	Construction: MM NOI-1 Operation: None Required	Construction: MM NOI-1 Operation: None Required	None Required
	Impact After Mitigation	Construction: LTS Operation: No Impact	Construction: LTS Operation: No Impact	Construction: LTS Operation: No Impact	Construction: LTS Operation: No Impact	Construction: No Impact Operation: No Impact
Impact NOI-2: Ground-Borne Noise and Vibration	Impact Before Mitigation	Construction: LTS Operation: LTS	Construction: LTS Operation: LTS	Construction: LTS Operation: LTS	Construction: No Impact Operation: No Impact	Construction: No Impact Operation: No Impact
	Mitigation Measures	None Required	None Required	None Required	None Required	None Required
	Impact After Mitigation	Construction: LTS Operation: LTS	Construction: LTS Operation: LTS	Construction: LTS Operation: LTS	Construction: No Impact Operation: No Impact	Construction: No Impact Operation: No Impact
Impact NOI-3: Airport Noise	Impact Before Mitigation	Construction: No Impact Operation: No Impact	Construction: No Impact Operation: No Impact	Construction: No Impact Operation: No Impact	Construction: No Impact Operation: No Impact	Construction: LTS Operation: LTS
	Mitigation Measures	None Required	None Required	None Required	None Required	None Required
	Impact After Mitigation	Construction: No Impact Operation: No Impact	Construction: No Impact Operation: No Impact	Construction: No Impact Operation: No Impact	Construction: No Impact Operation: No Impact	Construction: LTS Operation: LTS

Source: Connect Los Angeles Partners 2024

[1] For the KNE San Vicente–Fairfax Alignment, significant impacts would occur at Crenshaw/Adams, Wilshire/Fairfax, Fairfax/3rd, La Cienega/Beverly, San Vicente/Santa Monica, Fairfax/Santa Monica, La Brea/Santa Monica, and Hollywood/Highland Stations, and mitigation would be required. There would be a less than significant impact at the Midtown Crossing Station.

[2] For the KNE Fairfax Alignment, significant impacts would occur at Crenshaw/Adams, Wilshire/Fairfax, Fairfax/3rd, Fairfax/Santa Monica, La Brea/Santa Monica, and Hollywood/Highland Stations, and mitigation would be required. There would be a less than significant impact at the Midtown Crossing Station.

[3] For the KNE La Brea Alignment, significant impacts would occur at Crenshaw/Adams, Wilshire/La Brea, La Brea/Santa Monica, and Hollywood/Highland Stations, and mitigation would be required. There would be a less than significant impact at the Midtown Crossing Station.

LTS = less than significant impact