3 AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, AND MITIGATION MEASURES

3.4 Noise and Vibration

3.4.1 Introduction

Section 3.4, Noise and Vibration, of the Los Angeles to Anaheim Project Section (project section) Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) discusses the potential impacts and benefits of the No Project Alternative and the High-Speed Rail (HSR) Project Alternatives, otherwise called Shared Passenger Track Alternative A and Shared Passenger Track Alternative B, and describes impact avoidance and minimization features (IAMF) that will avoid, minimize, or reduce the impacts. Mitigation measures are proposed to further reduce, compensate for, or offset impacts of the Shared Passenger Track Alternatives. Section 3.4 also defines the noise and vibration resources within the region and describes the affected environment in the resource study areas (RSA).

PURPOSE

Noise and Vibration

Noise and vibration assessments are key elements of the environmental impact analysis process for rail projects. Noise is one of the principal environmental impacts associated with rail projects and has been identified as a public concern throughout the public involvement process. The purpose of this analysis is to examine potential environmental noise and vibration impacts of the project.

The following technical report, available on request, serves as a basis for the noise and vibration information in this section:

- *Los Angeles to Anaheim Project Section Noise and Vibration Technical Report* (Authority 2025)

Additional details on noise and vibration are provided in the following appendices in Volume 2 of this Draft EIR/EIS:

- Appendix 2-A, Impact Avoidance and Minimization Features
- Appendix 2-B, Applicable Design Standards
- Appendix 3.1-A, Regional and Local Policy Inventory and Consistency Analysis
- Appendix 3.4-A, Noise and Vibration Mitigation Guidelines

This section includes detailed analysis of environmental resources, affected environment, environmental consequences, and mitigation measures based on the guidance provided in *Project Environmental Impact Report/Environmental Impact Statement Environmental Methodology Guidelines,* Versions 5.9 and 5.11 as amended (Authority 2017a, 2022). Nine other resource sections in this Draft EIR/EIS provide additional information related to noise and vibration resources:

- **Section 3.2, Transportation:** Construction and operational changes and regional benefits of the Shared Passenger Track Alternatives on automobile, pedestrian, and bicycle traffic.
- **Section 3.7, Biological Resources and Wetlands:** Construction and operational noise changes and benefits of the Shared Passenger Track Alternatives on fauna in the biological resources and wetlands RSAs.
- **Section 3.9, Geology, Soils, Seismicity, and Paleontological Resources:** Construction and operational changes and benefits of the Shared Passenger Track Alternatives on soil erosion and stability that could affect hazardous materials and waste sites, as well as natural phenomena such as earthquakes.
- **Section 3.11, Safety and Security:** Construction and operational changes and benefits of the Shared Passenger Track Alternatives on emergency response preparedness in the event of leaks, spills, or accidents involving hazardous materials and wastes.

- **Section 3.12, Socioeconomics and Communities:** Construction and operational changes and benefits of the Shared Passenger Track Alternatives on socioeconomics and communities.
- **Section 3.13, Station Planning, Land Use, and Development:** Construction and operational changes and benefits of the Shared Passenger Track Alternatives on land use compatibility and development.
- **Section 3.15, Parks, Recreation, and Open Space:** Construction and operational changes and benefits of the Shared Passenger Track Alternatives on public areas such as parks, open space, and areas of recreation.
- **Section 3.17, Cultural Resources:** Construction and operational changes and benefits of the Shared Passenger Track Alternatives on cultural resources and historic properties in the project section.
- **Section 3.19, Cumulative Impacts:** Construction and operational changes and benefits of the Shared Passenger Track Alternatives and other past, present, and reasonably foreseeable future projects.

Impact summaries and conclusions for the Shared Passenger Track Alternatives are presented in Section 3.4.6, Environmental Consequences. The National Environmental Policy Act (NEPA) Impacts Summary (Section 3.4.8) summarizes the impacts and compares them to the anticipated impacts of the No Project Alternative. The California Environmental Quality Act (CEQA) Significance Conclusions (Section 3.4.9) provides a summary of CEQA determination of significance for all construction and operational changes.

3.4.1.1 Definition of Resources

The following are definitions for the noise and vibration resources analyzed in this Draft EIR/EIS:

- **Noise:** Noise is generally defined as a loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity and that interferes with or disrupts normal activities. Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. Noise can interrupt ongoing activities and can result in community annoyance, especially in residential areas.
- **Vibration:** Vibration is an oscillatory motion that can be described in terms of the displacement, velocity, or acceleration of an object. Ground-borne vibration generated by rail systems and construction activity can be a serious concern for occupants of nearby buildings, causing feelable movement of building floors, rattling of windows, or shaking of items on shelves or hanging on walls. Ground-borne vibration can also cause rumbling sounds inside buildings, referred to as ground-borne noise. Although vibration can cause damage to buildings in extreme cases, building damage is not a factor for normal transportation projects with the occasional exception of blasting and pile driving during construction.

3.4.2 Laws, Regulations, and Orders

This section describes the federal, state, and local laws, regulations, orders, and plans that are relevant to noise and vibration. General NEPA and CEQA requirements for assessment and disclosure of environmental impacts are described in Section 3.1, Introduction, and are therefore not restated in this resource section. NEPA and CEQA requirements specific to the evaluation of noise and vibration are, however, described in this section.

3.4.2.1 Federal

Federal Railroad Administration, Procedures for Considering Environmental Impacts (64 *Federal Register* 28545)

On May 26, 1999, the Federal Railroad Administration (FRA) released Procedures for Considering Environmental Impacts (FRA 1999). These FRA procedures describe the FRA's process for assessing the environmental impacts of actions and legislation proposed by the

agency and for the preparation of associated documents (U.S. Code 42, Section 4321 et seq.). The FRA Procedures for Considering Environmental Impacts states that "the EIS should identify any significant changes likely to occur in the natural landscape and in the developed environment. The EIS should also discuss the consideration given to design quality, art, and architecture in project planning and development as required by U.S. Department of Transportation Order 5610.4." These FRA procedures state that an EIS should consider possible impacts of noise and vibration.

Noise Control Act of 1972 (49 U.S. Code 4910)

The Noise Control Act of 1972 (42 U.S. Code 4910) was the first comprehensive statement of national noise policy. It declared, "it is the policy of the United States to promote an environment for all Americans free from noise that jeopardizes their health or welfare." Although the act, as a funded program, was ultimately abandoned at the federal level, it served as the catalyst for comprehensive noise studies and the generation of noise assessment and mitigation policies, regulations, ordinances, standards, and guidance for many states, counties and municipal governments. For example, the noise elements of community general plans and local noise ordinances studied as part of this analysis were largely created in response to passage of the act.

Occupational Safety and Health Administration Occupational Noise Exposure (29 Code of Federal Regulations [CFR] Part 1910.95)

The Occupational Safety and Health Administration (29 CFR Part 1910.95) has regulated worker noise exposure to a time-weighted-average of 90 A-weighted decibels (dBA) over an 8-hour work shift. Areas where levels exceed 85 dBA must be designated and labeled as high-noise-level areas where hearing protection is required. This noise exposure criterion for workers would apply to project construction activities. Noise from construction activities might also elevate noise levels at nearby construction sites to levels that exceed 85 dBA and thus trigger the need for administrative or engineering controls and hearing conservation programs for worker safety, as detailed by the Occupational Safety and Health Administration.

U.S. Environmental Protection Agency Railroad Noise Emission Standards (40 CFR Part 201)

The U.S. Environmental Protection Agency (USEPA) has issued noise emission standards (40 CFR Part 201), which set maximum measured noise levels for locomotives manufactured after 1979, as follows:

- One hundred feet from the geometric center of a stationary locomotive, connected to a load cell and operating at any throttle setting except idle: 87 dBA (at idle setting, 70 dBA)
- One hundred feet from the geometric center of a mobile locomotive: 90 dBA
- One hundred feet from the geometric center of mobile railcars, at speeds up to 45 miles per hour (mph): 88 dBA (at speeds greater than 45 mph, 93 dBA)

Federal regulations exist, issued in the early 1980s by USEPA, that generally limit the strength or loudness of noise a locomotive or railcar may generate (40 CFR Part 201.12/13). Whether or not this regulation applies to high-speed trainsets, the analysis in this EIR/EIS does not assume that California High-Speed Rail Authority (Authority) trainsets will comply with the noise-generation standard of this regulation because the Authority is not aware of any high-speed trainsets manufactured in the world today that meet this standard at all speeds. A noise-generation standard specific to high-speed trains does exist in Europe (European Technical Specification for Interoperability Standard), and a trainset manufactured to those standards complies with the USEPA standard (if applicable) generally at speeds below 190 to 200 mph. Above that speed, airflow over the trainset and its pantograph and related apparatus is the main source of noise, which presently known technology cannot resolve to comply with the USEPA standard (if applicable). The analysis in this EIR/EIS—both prior to and after mitigation—assumes a trainset generating noise in compliance with the European Technical Specification for Interoperability

Standard, because trainsets currently in manufacture and operation in Europe can meet this standard; the analysis does not assume a trainset that meets the USEPA standard.

Federal Railroad Administration Noise and Vibration Impact Assessment Guidelines

The FRA provides guidance regarding the evaluation of noise and vibration impacts from construction and operations of high-speed trains in *High-Speed Ground Transportation Noise and Vibration Impact Assessment* (FRA 2012). The manual includes prediction methods, assessment procedures, and impact criteria for noise and vibration. Section 3.4.4, Methods for Evaluating Impacts, discusses noise and vibration impact criteria.

Railroad Noise Emission Compliance Regulations (49 CFR Part 210)

The FRA's Railroad Noise Emission Compliance Regulation (49 CFR Part 210) prescribes minimum compliance regulations for enforcement of Noise Emission Standards for Transportation Equipment; Interstate Rail Carriers (40 CFR Part 201) adopted by USEPA. New locomotives must meet the following noise standards: 70 dBA at 100 feet while stationary at idle throttle setting, 87 dBA at 100 feet while stationary at all other throttle settings, and 90 dBA at 100 feet while moving. Rail cars must meet the following noise standards: 88 dBA while moving at speeds of 45 mph or less, and 93 dBA at 100 feet while moving at speeds faster than 45 mph.

Whether or not the USEPA standard applies to high-speed trainsets, the analysis in this EIR/EIS does not assume that Authority trainsets would comply with it because the Authority is not aware of any high-speed trainsets manufactured in the world today that meet this standard at all speeds. A noise-generation standard specific to high-speed trains does exist in Europe (European Technical Specification for Interoperability Standard), and a trainset manufactured to that standard complies with the USEPA standard (if applicable) generally at speeds below 190 to 200 mph. Above 200 mph, airflow over the trainset and its pantograph and related apparatus is the main source of noise, which presently known technology cannot resolve to comply with the USEPA standard (if applicable). The analysis in this EIR/EIS—both prior to and after mitigation—assumes a trainset generating noise in compliance with the European Technical Specification for Interoperability standard. Because trainsets currently in manufacture and operation in Europe can meet this standard; the analysis does not assume a trainset that meets the USEPA standard. In this project section the maximum HSR speeds would be less than 220 mph.

Locomotive Horn Rule (49 CFR Part 222 and Part 229)

FRA regulations require that engineers sound their locomotive horns while approaching public grade crossings until the lead locomotive fully occupies the crossing. In general, the regulations require locomotive engineers to begin to sound the train horn for a minimum of 15 seconds, and a maximum of 20 seconds, in advance of public grade crossings. Engineers must also sound the train horn in a standardized pattern of two long, one short and one long blast and the horn must continue to sound until the lead locomotive or train car occupies the grade crossing. Additionally, the minimum sound level for the locomotive horn is 96 dBA and the maximum sound level is 110 dBA, both measured at 100 feet forward of the locomotive. The FRA allows public authorities to establish a quiet zone, which is a segment of a rail line within which is situated one or a number of consecutive public road-rail crossings at which locomotive horns are not routinely sounded, provided sufficient safety measures are implemented at the crossing to prevent/minimize the potential for accidents to occur. Railroad authorities including Caltrain, the Authority, and railroad companies (such as Union Pacific Railroad [UPRR]) cannot establish quiet zones; only local cities and counties can establish them by applying to the FRA.

At a minimum, new quiet zones must be at least 0.5 mile in length and contain at least one public grade crossing (i.e., a location where a public highway, road, or street crosses one or more railroad tracks at grade). Every public grade crossing in a quiet zone must be equipped at a minimum with active grade crossing warning devices consisting of flashing lights and gates.

If a public authority wants to establish a new quiet zone, it must conduct an assessment of hazards related to the crossings in the proposed zone and implement sufficient safety measures to reduce the proposed quiet zone's risk level to an acceptable level. Improvements may include

roadway medians or channelization devices to discourage motorists from driving around a lowered crossing gate; a four-quadrant gate system to block all lanes of highway traffic; converting a two-way street into a one-way street and installing crossing gates; and permanent or temporary (nighttime) closure of the crossing to highway traffic. As an alternative, communities may also choose to silence routine locomotive horn sounding through the installation of wayside horns at public grade crossings. Wayside horns are train-activated stationary acoustic devices at grade crossings that are directed at highway traffic as a one-for-one substitute for train horns.

Federal Transit Administration Guidelines

The Federal Transit Administration (FTA) provides guidance regarding the evaluation of noise and vibration impacts associated with construction and operations of non-high-speed trains in *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018). The manual includes prediction methods, assessment procedures, and impact criteria for noise and vibration. Although it was originally developed for use on public mass transit projects, the FTA guidance manual includes a method that is applicable to HSR station activities, yard and maintenance facility activities, and conventional-speed rail operations. The FTA construction noise and vibration assessment method is consistent with the FRA method. Section 3.4.4.4, Methods for Impact Analysis, discusses the noise and vibration impact criteria.

Federal Highway Administration Procedures for Abatement of Highway Traffic Noise and Construction Noise (23 CFR Part 772)

The Federal Highway Administration (FHWA) stipulates procedures and criteria for noise assessment studies of highway projects (23 CFR Part 772). It requires that noise abatement measures be considered on all major highway projects if the project will cause a substantial increase in traffic noise levels or if projected traffic noise levels approach or exceed the noise abatement criteria (NAC) level for activities occurring on adjacent lands. These noise criteria are assigned to exterior and interior activities and are presented in Table 3.4-1.

If motor vehicle traffic noise from federally funded projects is predicted to approach or exceed the NAC during the noisiest 1-hour period, noise abatement measures must be considered, and, if determined to be reasonable and feasible, they must be incorporated as part of the project. Consistent with FHWA guidelines, the California Department of Transportation (Caltrans) defines “approach” as being within 1 dBA of the NAC. Caltrans criteria also consider that a 12-decibel (dB) increase in the noisiest 1-hour period is a significant increase as defined by the FHWA procedures.

Table 3.4-1 Federal Highway Administration Noise Abatement Criteria in A-Weighted Decibels

Activity Category	Activity Criteria[1] $L_{eq}(h)$	Evaluation Location	Activity Description
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B[3]	67	Exterior	Residential
C[3]	67	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, daycare centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trails crossings

Activity Category	Activity Criteria[1] $L_{eq}(h)$	Evaluation Location	Activity Description
D	52	Interior	Auditoriums, daycare centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios
E[2]	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in activity categories A through D or F
F	--	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
G	--	--	Undeveloped lands that are not permitted

Source: FHWA 2011
[1] The $L_{eq}(h)$ Activity Criteria values are for effect determination only, and are not design standards for noise abatement measures.
[2] Includes undeveloped lands permitted for this activity category.
dBA = A-weighted decibels; $L_{eq}(h)$ = hourly sound equivalent level

3.4.2.2 State

California Noise Control Act (California Health and Safety Code, Section 46010 et seq.)

At the state level, the California Noise Control Act of 1973 (California Health and Safety Code, Section 46010 et seq.) provides for the Office of Noise Control in the Department of Health Services to assist communities in developing local noise control programs and to work with the Office of Planning and Research to provide guidance for the preparation of the required noise elements in city and county general plans, pursuant to California Government Code, Section 65302(f). In preparing the noise element, a city or county must identify local noise sources and analyze and quantify, to the extent practicable, current and projected noise levels for various sources, including highways and freeways, passenger and freight railroad operations, ground rapid transit systems, commercial, general, and military aviation and airport operations, and other ground stationary noise sources (these would include HSR alignments). Noise-level contours must be mapped for these sources, using both community noise equivalent level (CNEL) and day-night average sound level (L_{dn}), and are to be used as a guide in land use decisions to minimize the exposure of community residents to excessive noise.

General Plan Guidelines (California Government Code Section 65302(f)), Appendix C, Noise Element Guidelines

The noise element of a community's general plan provides a basis for a comprehensive local program to control and abate environmental noise and to protect citizens from excessive exposure. The California Governor's Office of Planning and Research General Plan Guidelines 2017 (OPR 2017) outline the development of the noise element for local agencies.

City and county agencies often adopt the guidelines for land use planning purposes for acoustical compatibility based on existing ambient noise levels in the community. For example, commercial land uses are considered appropriate where existing noise levels might be considered too high for residential development.

California Department of Transportation Traffic Noise Analysis Protocol

The Caltrans Traffic Noise Analysis Protocol (Caltrans 2020) establishes guidelines for evaluating traffic noise impacts along highways where frequent outdoor use areas are located and for determining reasonable and feasible noise abatement measures. These criteria are relevant to the extent that the project could result in reconstruction or reconfiguration of an existing highway or traffic lanes, or could affect traffic patterns. Under FHWA and Caltrans policies, noise

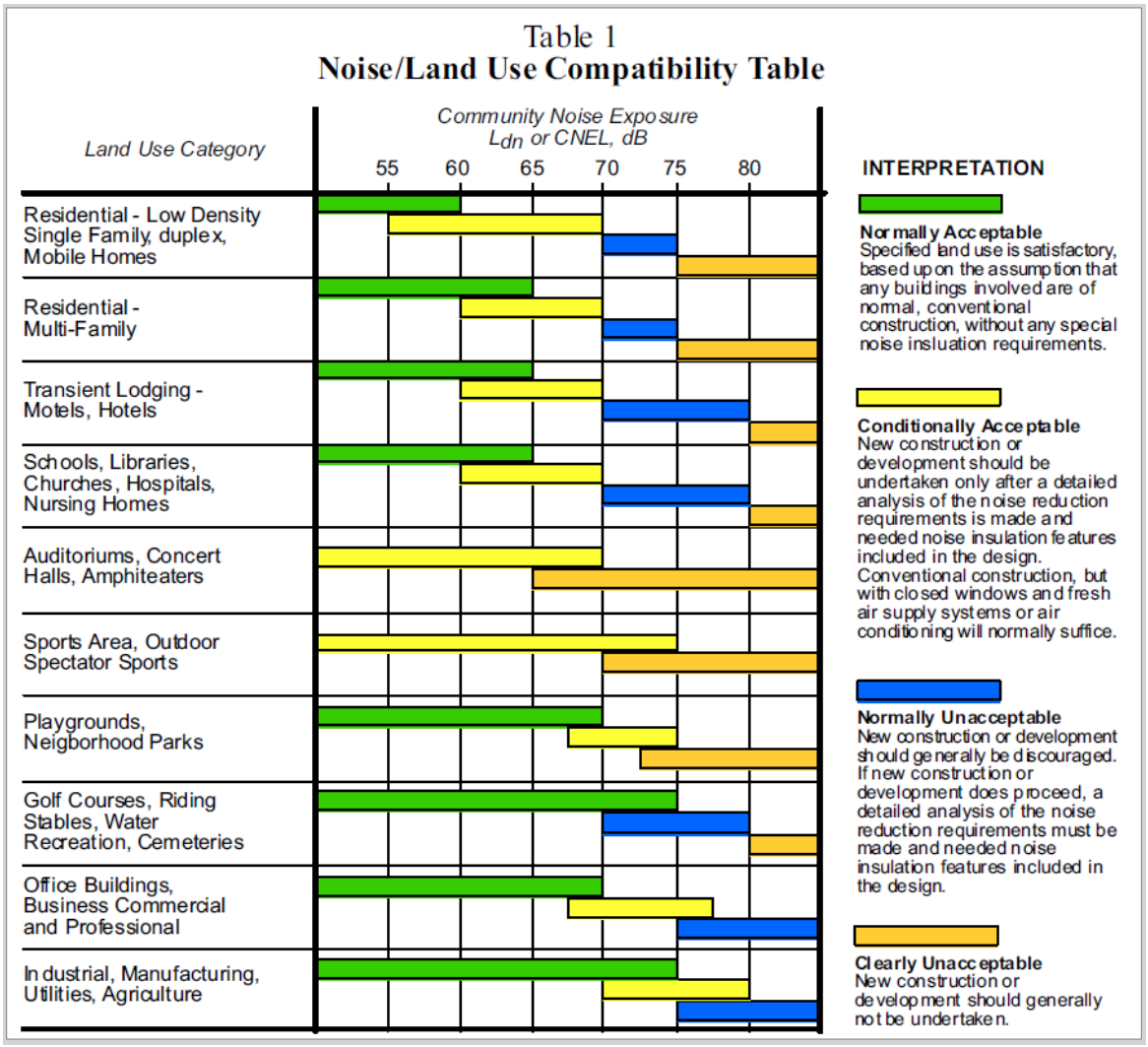
abatement should be considered for transportation improvement projects when various traffic NAC are exceeded.

Title 24, Part 2, California Code of Regulations

The California Noise Insulation Standard (California Code of Regulations Title 24, Part 2, Chapter 35, Section 3501) limits interior noise exposure levels within multifamily (not single-family detached houses) residential developments to 45 dBA CNEL or 45 dBA L_{dn}.

The standard is often adopted by city and county agencies for land use planning purposes. The California Department of Health Land Use Compatibility Criteria feature guidelines for acoustical compatibility based on existing ambient noise levels in the community. For example, commercial land uses are considered appropriate where existing noise levels might be considered too high for residential development.

The California Governor's Office of Planning and Research has published general plan guidelines for cities and counties in California. The guidelines provide recommended land use compatibility standards for noise. These standards, expressed as ranges, are presented on Figure 3.4-1.



Source: OPR 2003

Figure 3.4-1 State of California Land Use Compatibility Guidelines

3.4.2.3 Regional and Local

This section discusses relevant regional and local programs, policies, regulations, and permitting requirements. The project section would primarily be within Los Angeles and Orange Counties and the cities of Los Angeles, Vernon, Commerce, Bell, Montebello, Pico Rivera, Santa Fe Springs, Norwalk, La Mirada, Buena Park, Fullerton, and Anaheim. Table 3.4-2 lists local plans and policies that were identified and considered for analysis.

Table 3.4-2 Regional and Local Plans and Policies

Policy Title	Summary
Los Angeles County	
Los Angeles County 2035 General Plan, Noise Element (2025)	▪ Goal N 1: The reduction of excessive noise impacts. – Policy N 1.1: Utilize land uses to buffer noise-sensitive uses from sources of adverse noise impacts. – Policy N 1.2: Reduce exposure to noise impacts by promoting land use compatibility. – Policy N 1.3: Minimize impacts to noise-sensitive land uses by ensuring adequate site design, acoustical construction, and use of barriers, berms, or additional engineering controls through Best Available Technologies (BAT). – Policy N 1.4: Enhance and promote noise abatement programs in an effort to maintain acceptable levels of noise as defined by the Los Angeles County Exterior Noise Standards and other applicable noise standards. – Policy N 1.5: Ensure compliance with the jurisdictions of State Noise Insulation Standards (Title 24, California Code of Regulations and Chapter 35 of the Uniform Building Code), such as noise insulation of new multifamily dwellings constructed within the 60-dB (CNEL or L_{dn}) noise-exposure contours. – Policy N 1.6: Ensure cumulative impacts related to noise do not exceed health-based safety margins. – Policy N 1.7: Utilize traffic management and noise suppression techniques to minimize noise from traffic and transportation systems. – Policy N 1.8: Minimize noise impacts to pedestrians and transit-riders in the design of transportation facilities and mobility networks. – Policy N 1.9: Require construction of suitable noise attenuation barriers on noise-sensitive uses that would be exposed to exterior noise levels of 65 dBA CNEL and above, when unavoidable impacts are identified. – Policy N 1.10: Orient residential units away from major noise sources (in conjunction with applicable building codes). – Policy N 1.11: Maximize buffer distances and design and orient sensitive receptor structures (hospitals, residential, etc.) to prevent noise and vibration transfer from commercial/light industrial uses. – Policy N 1.12: Decisions on land adjacent to transportation facilities, such as the airports, freeways and other major highways, must consider both existing and future noise levels of these transportation facilities to assure the compatibility of proposed uses.
Los Angeles County Airport Land Use Commission Comprehensive Land Use Plan (2004)	▪ Policy N-1: Use community Noise Equivalent Level (CNEL) method for measuring noise impacts near airports in determining suitability for various types of lands uses. ▪ Policy N-3: Utilize the Table Listing Land Use Compatibility for Airport Noise Environments in evaluating projects within the planning boundaries.

Policy Title	Summary
Los Angeles County Code of Ordinances (2025)	Section 12.08.010 of the County Code aims "to control unnecessary, excessive, and annoying noise and vibration…." It declares that the purpose of the County policy is to "…maintain quiet in those areas which exhibit low noise levels and to implement programs aimed at reducing noise in those areas within the county where noise levels are above acceptable values." Table 11.2 of the Noise General Element overviews Los Angeles County Community Noise Criteria and additional information on noise barrier strategies can be found in Appendix G of the County of Los Angeles Code of Ordinances. Section 12.08.350, states, "operating or permitting the operation of any device that creates vibration that is above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property, or at 150 feet (46 meters) from the source if on a public space or public right-of-way is prohibited. The perception threshold shall be a motion velocity of 0.01 in/sec [inch per second] over the range of 1 to 100 Hertz."
City of Los Angeles	
City of Los Angeles General Plan, Noise Element (2024)	▪ Objective 2 (Nonairport): Reduce or eliminate nonairport related intrusive noise, especially relative to noise-sensitive uses. – Policy 2.2: Enforce and/or implement applicable city, state and federal regulations intended to mitigate proposed noise producing activities, reduce intrusive noise and alleviate noise that is deemed a public nuisance. ▪ Objective 3 (Land Use Development): Reduce or eliminate noise impacts associated with proposed development of land and changes in land use. – Policy 3.1 Develop land use policies and programs that will reduce or eliminate potential and existing noise impacts.
Downtown Community Plan (2024)	▪ Program: Implement appropriate provisions of the City's Noise Element.
Los Angeles Municipal Code (2025)	Chapter XI Section 111.02, Sound Level Measurement Procedure and Criteria sets forth how to measure sound. Chapter XI Article 2 covers special noise sources including construction noise, power equipment intended for repetitive use in residential areas, other machinery, equipment and devices, and maximum noise level of powered equipment or power hand tools. Chapter IV, Public Welfare, Section 41.40, Noise due to Construction, Excavation Work – When Prohibited, stipulates prohibitions and restrictions for construction noise in Los Angeles.

Policy Title	Summary
City of Vernon	
City of Vernon General Plan, Noise Element (2023)	▪ Goal N-1: Reduce impacts from transportation noise sources to the extent they may affect industrial businesses. – Policy N-1.1: Encourage the effective enforcement of local, state, and federal noise levels by all appropriate City divisions. – Policy N-1.2: Review noise impacts when rail corridors are consolidated, and review ways to reduce impacts on adjacent businesses. – Policy N-1.3: Minimize adverse noise effects on new residential developments through carefully planned site design and construction approaches that limit noise intrusion, wherever practical. ▪ Goal N-2: Incorporate noise and vibration considerations into land use planning decisions. – Policy N-2.1: Consider the noise levels likely to be produced by any new businesses or substantially expanded business activities locating near existing noise-sensitive uses such as schools, community facilities, and residences, as well as adjacent to established businesses involving vibration-sensitive activities. – Policy N-2.2: Encourage acoustical design in all new construction. – Policy N-2.3: Prohibit the establishment of new noise-sensitive land uses in Vernon, including but not limited to schools, daycare facilities, and community facilities. Permit new residential uses only within the Housing Overlay District, and require new developments to incorporate appropriate noise attenuation to achieve City noise standards. ▪ Goal N-3: Develop measures to control non-transportation noise and similar impacts. – Policy N-3.1: Continue to enforce the noise and vibration performance standards in the City Code to mitigate conflicts among neighboring uses. – Policy N-3.2: Establish and maintain coordination among City agencies involved in noise abatement. – Policy N-3.3: City departments will comply with all state and federal OSHA noise standards, and all new City equipment purchases shall comply with state and federal noise standards.
The Code of the City of Vernon (2024)	Table 17.22.070 outlines noise standards for the city of Vernon.

Policy Title	Summary
City of Bell	
City of Bell 2030 General Plan, Health and Safety Element (2022)	▪ Policy 20: The City of Bell shall encourage the reduction of noise throughout the City in the review of new development. New development projects will undergo review to ensure that noise impacts from such developments are reduced as much as possible. ▪ Policy 21: The City of Bell shall promote the development of a compatible noise environment throughout the City. The City shall consider noise and land use compatibility in the review of new development projects. ▪ Policy 22: The City of Bell shall implement noise regulations that will lower excessive and intrusive noise levels that conform to acceptable standards. The City shall ensure Code Enforcement and the Police Department will continue to enforce noise control regulations. ▪ Policy 23: The City of Bell shall cooperate with all public agencies so as to minimize transportation related noise. Applicable city, state, and federal noise control regulations shall be enforced. ▪ Policy 25: The City of Bell shall ensure that the design and improvement of future master planned roadway links in the city is accomplished in a manner that minimizes noise impacts on adjacent noise sensitive land uses. These measures may involve the use of sound walls and other architectural features that promote noise reduction. ▪ Policy 26: The City of Bell shall continue to require noise attenuation in new residential developments that are exposed to significant noise levels from freeway and arterial roadway traffic. The City shall make every effort to inform developers, businesses, and residents of noise control measures. Noise studies must be performed new noise sensitive projects that are located near arterial roadways and freeways.
City of Bell Municipal Code (2024)	Chapter 8.28 of the City of Bell Municipal Code covers noise for the city of Bell.

Policy Title	Summary
City of Commerce	
City of Commerce 2020 General Plan (2008)[1]	▪ Safety Policy 6.1: The City of Commerce will ensure that residents are protected from harmful and irritating noise sources to the greatest extent possible. ▪ Safety Policy 6.2: The City of Commerce will work with businesses in the city and other public agencies to identify ways to reduce noise impacts throughout the city. ▪ Safety Policy 6.3: The City of Commerce will continue to enforce the existing city's noise control ordinance. ▪ Safety Policy 6.4: The City of Commerce will incorporate noise considerations into land use planning decisions. ▪ Safety Policy 6.5: The City of Commerce will prohibit noise-intensive land uses adjacent to or near residential areas, schools, convalescent homes, and other noise-sensitive receptors. ▪ Safety Policy 6.6: The City of Commerce will encourage acoustical design in all new construction. ▪ Safety Policy 6.7: The City of Commerce will require additional landscaping in industrial and commercial projects to help reduce noise impacts through increased setbacks. ▪ Safety Policy 6.10: The City of Commerce will establish and maintain coordination among the city agencies involved in noise abatement. ▪ Safety Policy 7.1: The City of Commerce will strive to reduce railroad noise impacts in the vicinity of Astor Avenue. ▪ Safety Policy 7.2: The City of Commerce will work with Union Pacific Railroad to reduce noise impacts from railroad operations in the vicinity of Washington Boulevard. ▪ Safety Policy 7.3: The City of Commerce will provide for measures to reduce noise impacts from transportation-related noise sources. ▪ Safety Policy 7.4: The City of Commerce will evaluate the feasibility of constructing sound barriers to mitigate transportation-related noise from railroads and the freeways. ▪ Safety Policy 7.5: The City of Commerce, together with the railroads, will consider the feasibility of constructing sound walls wherever residential uses abut railroad rights-of-way.
Commerce Municipal Code (2024)	The noise ordinance of the City of Commerce Municipal Code is Section 19.19.160 and the vibration ordinance is Section 19.19.180.
City of Montebello	
City of Montebello General Plan (2024)	▪ Goal CSS-5: Minimize the exposure of residents to unhealthful noise conditions. – Policy CSS-5.1: Prioritize the reduction of traffic-related noise in residential areas and near noise-sensitive land uses. – Policy CSS-5.2: Strictly enforce violations of Chapter 9.08 of the Montebello Municipal Code related to public nuisances in the form of loud or raucous noise. – Policy CSS-5.4: Enforce the use truck routes to minimize traffic noise impacts on residential neighborhoods. – Policy CSS-5.5: Work with railroad operators to ensure that the timing, length of idleness, and number of trains through the City limits noise impacts.
Montebello Municipal Code (2024)	The noise ordinance of the City of Montebello Municipal Code is Section 17.22.110 and the vibration ordinance is Section 17.32.170.

Policy Title	Summary
City of Pico Rivera	
City of Pico Rivera General Plan (2014)	▪ Goal 11.1: An acceptable noise environment for existing and future residents that also meets the business needs of the community. – Policy 11.1-1 Land Use Compatibility: Strive to achieve and maintain land use patterns that are consistent with the noise compatibility guidelines set forth in Table 11-1. – Policy 11.1-2 Existing Noise Incompatibilities: Within areas where existing or future noise levels exceed the guidelines set forth in Table 11-1, encourage establishment of noise buffers and barriers, modifications to noise-generating operations, and/or retrofitting of buildings housing noise-sensitive uses, where feasible and appropriate. ▪ Goal 11.2: Minimize disruptions to residential neighborhoods and businesses caused by transportation-related noise. – Policy 11.2-1 New High Noise-Generating Uses: Locate future transit stations, rail projects such as the potential Metro Gold Line light rail and High Speed Rail, or other high noise-generating uses away from noise-sensitive land uses to the extent feasible. – Policy 11.2-5 Development along Major Roadways and Rail Lines: Require that noise attenuation measures be incorporated into all new development and remodels of noise-sensitive uses in close proximity to major roadways and existing or known planned rail lines where railroad-generated noise levels exceed the guidelines set forth in Table 11-1. – Policy 11.2-6 Railroad Noise: Work with the railroad lines operating in Pico Rivera to minimize noise levels produced by trains and whistle noise by continuing to construct additional grade separations at busy intersections, reducing nighttime operations, and maintaining consistency with the noise levels shown in Table 11-1. ▪ Goal 11.3: Minimize disruptions to residential neighborhoods and businesses caused by construction-related noise. – Policy 11.3-1 Construction Noise: Minimize construction-related noise and vibration by limiting construction activities within 500 feet of noise-sensitive uses from 7:00 A.M. to 7:00 P.M. seven days a week; after hour permission shall be granted by City staff, Planning Commission, or the City Council. – Policy 11.3-2 Vibration Standards: Require construction projects and new development anticipated to generate a significant amount of vibration to ensure acceptable interior vibration levels at nearby noise-sensitive uses based on Federal Transit Administration criteria as shown in Table 11-2.
Pico Rivera Municipal Code (2025)	The noise ordinance of the City of Pico Rivera Municipal Code is Chapter 8.40.

Policy Title	Summary
City of Santa Fe Springs	
Re-Imagine Santa Fe Springs 2040 General Plan, Noise Element (2022)	▪ Transportation Noise Goal N-1: Reduced Traffic and Train Noise. – Policy N-1.2: Residential Noise Impacts. Update truck routes and redesignate routes to reduce noise exposure in residential neighborhoods and on sensitive community noise receptors that are within noise zones of 70 CNEL or higher. – Policy N-1.5: Rail Noise and Vibrations. Consult with rail companies that operate lines through the City to include noise and vibration reduction strategies— signal noise, at-grade crossing noise, and vibration levels produced by heavy and light rail traffic—to minimize train noise impacts on residential neighborhoods. ▪ Noise and Land Use Planning Integration Goal N-2: Land Use Decisions that Minimize Noise Exposure. – Policy N-2.1: Noise Standards. Review and update as necessary noise standards in the Municipal Code to ensure they sufficiently address community noise. – Policy N-2.2: Land Use Compatibility. Include the noise/land use compatibility standards of Table N-1 and compliance with the Municipal Code noise regulations as part of development review. – Policy N-2.3: Noise Studies. Require developers of projects that are considered potential sources of noise, or when the projects are proposed next to existing or planned noise-sensitive land uses to prepare an acoustical study that describes the existing and future noise environments and defines noise-reducing design incorporated into the project that will achieve a noise environment consistent with City standards and guidelines.
Code of Santa Fe Springs (2025)	The noise ordinance of the City of Santa Fe Springs Municipal Code is Section 155.424 and the vibration ordinance is Section 155.428.
City of Norwalk	
Vision Norwalk – The City of Norwalk General Plan, Noise Element (2023)	▪ Objective: To have noise levels in all areas of the City meet the minimum standards of land use compatibility established in the Noise Element, especially adjacent to noise-sensitive uses. ▪ Objective: To promote the reduction of noise impacts from existing transportation to a new level of compatibility with adjoining land uses. ▪ Policy: Encourage compliance with state and federal legislation designed to abate and control noise pollution. ▪ Policy: Existing noise sources that exceed the appropriate maximum standard shall be encouraged to reduce their noise level to at least the land use compatibility standards of the noise element. ▪ Policy: Discourage truck traffic from using local residential streets. ▪ Policy: Encourage railroads to institute noise reduction techniques to reduce impacts on adjoining land uses. ▪ Policy: Ensure that proposed noise sources are reduced below a level of significance and properly muffled to prevent noise impacts on neighboring properties.
Norwalk Municipal Code (2024)	The noise ordinance is in the City of Norwalk Municipal Code Section 9.04 Article 3, Noise.

Policy Title	Summary
City of La Mirada	
City of La Mirada General Plan (2003)	– Policy 4.1: Work with railroad companies to install a grade separation at Valley View Avenue to reduce congestion and noise caused by trains. ▪ Goal 5.0: Shield residents from undesirable traffic noise to the extents possible. ▪ Goal 6.0: Reduce noise originating from the regional transportation system. – Policy 6.2: Work with railroad operators to ensure that the timing and number of trains passing through the City limits noise impacts. – Policy 6.3: Pursue completion of a grade separation of the rail line at Valley View Boulevard and Stage Road.
La Mirada Code of Ordinances (2024)	The noise and vibration ordinance of the La Mirada Code of Ordinances is Section 21.70.080.
Orange County	
County of Orange General Plan (2025)	▪ Policy 1: To cooperate with other County agencies and levels of government to bring about a comprehensive and coordinated effort to reduce noise levels. ▪ Policy 1.2: To cooperate in efforts to develop mechanisms to assure coordination of all governmental jurisdictions in the field of noise control. ▪ Policy 3: To encourage the control of noise from transportation systems as the most efficient and effective means of reducing noise at the source. ▪ Policy 3.4: To study commercial truck movements and operations in the county and establish truck routes away from noise-sensitive areas where feasible. ▪ Policy 3.5: To encourage development of a mass multimodal transit system with reduced noise emission characteristics. ▪ Policy 3.6: To review the Federal Railroad Noise Standards of 1974 for possible adoption by Orange County. ▪ Policy 4.0: To monitor noise levels, and adopt and enforce noise abatement programs. ▪ Policy 4.1: To enforce the County's Noise Ordinance to prohibit or mitigate harmful and unnecessary noise within the county. ▪ Policy 4.2: To encourage Orange County cities to adopt the County's model noise ordinance. ▪ Policy 4.3: To develop and enforce standards in addition to those presently included in the Noise Ordinance to regulate noise from construction and maintenance activities and commercial and public and industrial land uses. ▪ Policy 5.0: To fully integrate noise considerations in land use planning to prevent new noise/land use conflicts. ▪ Policy 5.1: To utilize the criteria of acceptable noise levels for various types of land uses as depicted on Tables VIII-2 and VIII-3 in the review of development proposal. ▪ Policy 5.3: To limit new non-residential noise-sensitive land uses that are within a 65-decibel CNEL area from any sources. ▪ Policy 5.4: To stress the importance of building and design techniques in future site planning for noise reduction. ▪ Policy 6.4: To require that all new residential units have an interior noise level in habitable rooms that does not exceed acceptable levels as caused by aircraft fly-overs or as caused by individual passing railroad trains.
Codified Ordinances of the County of Orange (2024)	Title 4, Division 6, Noise Control, of the Orange County Code of Ordinances contains ordinances related to noise which stipulates noise standards, procedures for sound measurement, and special provisions.

Policy Title	Summary
City of Buena Park	
Buena Park 2035 General Plan (2022)	▪ Goal N-1: Appropriate Federal, State, and City standards, guidelines, and ordinances for noise control implemented and enforced throughout the City. – Policy N-1.1: Continue to monitor noise throughout Buena Park and enforce the standards and regulations of the City's Noise Ordinance. – Policy N-1.2: Continue to enforce noise standards consistent with health and quality of life goals and employ effective techniques of noise abatement through such means as a noise ordinance, building codes, and subdivision and zoning regulations. – Policy N-1.5: Coordinate with California Occupational Safety and Health Administration (Cal-OSHA) to provide information on occupational noise requirements within the City. – Policy N-1.6: Conform to the noise attenuation standards sets forth in the Airport Environs Land Use Plan (AELUP) for residential, commercial, and industrial development within the Fullerton Municipal Airport and Los Alamitos Joint Forces Training Center planning areas. ▪ Goal N-2: Minimized noise levels from construction and maintenance equipment, vehicles, and activities. – Policy N-2.1: Regulate construction activities to ensure all noise associated with construction activities comply with the City's Noise Ordinance. – Policy N-2.2: Employ construction noise reduction methods to the maximum extent feasible. These measures may include, but not limited to, shutting off idling equipment, installing temporary acoustic barriers around stationary construction noise sources, maximizing the distance between construction equipment staging areas and occupied sensitive receptor areas, and use of electric air compressors and similar power tools, rather than diesel equipment. – Policy N-2.4: Exceedance of noise standards may occur on a case-by-case basis for special circumstances including emergency situations, special events, and expedited development projects. – Policy N-2.5: Ensure acceptable noise levels are maintained near schools, hospitals, convalescent homes, churches, and other noise-sensitive areas. ▪ Goal N-3: Consideration of noise affects in the land use planning process. – Policy N-3.1: Fully integrate noise considerations into land use planning decisions to prevent new noise/land use conflicts. – Policy N-3.2: Consider the compatibility of proposed land uses with the noise environment when preparing, revising, or reviewing development proposals. – Policy N-3.4: Permit only those new development or redevelopment projects that have incorporated appropriate mitigation measures, so that standards contained in the Noise Element or adopted ordinance are met. – Policy N-3.5: Encourage proper site planning and architecture to reduce noise impacts. – Policy N-3.6: Discourage the development of sensitive uses in areas in excess of 65 dBA CNEL without appropriate mitigation. – Policy N-3.9: Incorporate noise reduction features for items such as but not limited to parking and loading areas, ingress/egress point, HVAC units, and refuse collection areas, during site planning to mitigate anticipated noise impacts on affected noise-sensitive land uses.

Policy Title	Summary
	– Policy N-3.10: Require the design of mixed-use structures to incorporate techniques to prevent the transfer of noise and vibration from the commercial to residential use. – Policy N-3.14: Conform to the noise attenuation standards set forth in the Airport Environs Land Use Plan (AELUP) for residential, commercial, and industrial development, within the Orange County Airport Land Use Commissions planning area boundaries for the Fullerton Municipal Airport and Los Alamitos Joint Forces Training Base. ▪ Goal N-4: Ambient noise conditions in sensitive land use areas maintained and/or improved. – Policy N-4.1: Identify and reduce or eliminate unnecessary noise near noise-sensitive areas (such as parks, residential areas, hospitals, libraries, convalescent homes, etc.) to meet established regulations outlined in the City's Municipal Code. – Policy N-4.2: Encourage the use of noise absorbing materials in existing and new development to reduce interior noise impacts to sensitive land uses. – Policy N-4.3: Encourage existing noise-sensitive uses, including schools, libraries, health care facilities, and residential uses in areas where existing or future noise levels exceed 65 dBA CNEL to incorporate fences, walls, and/or other noise buffers and barriers, where appropriate and feasible. – Policy N-4.4: Discourage new projects located in commercial or entertainment areas from exceeding stationary-source noise standards at the property line of proximate residential or commercial uses, as appropriate. – Policy N-4.5: For sensitive land uses located near to or adjacent to industrial land uses, evaluate the ambient noise condition and, as appropriate, reduce noise affects upon the sensitive land use (such as erecting noise barriers, restricting hours of operation, investing in noise canceling technologies, etc.). – Policy N-4.6: Ensure new industrial uses comply with the City's Noise Ordinance. – Policy N-4.7: Encourage school districts or other educational facilities to locate outdoor activity areas, such as playgrounds and sport fields, away from residential areas. ▪ Goal N-5: Reduction of noise from circulation-related sources such as motor vehicles, trains, and airplanes. – Policy N-5.1: Encourage the construction of noise barriers and maintenance of existing noise barriers for residential uses along the Artesia (SR 91) and Santa Ana (I-5) Freeways. – Policy N-5.2: Continue to encourage the enforcement of regulations such as the State Vehicle Code Noise Standards for automobiles, trucks, and motorcycles operating within the City. – Policy N-5.3: Enforce established hours and routes for delivery trucks and through truck traffic. – Policy N-5.4: Discourage through traffic on residential local streets to reduce noise. – Policy N-5.5: Employ noise mitigation practices, as necessary, when designing future streets and highways, and when improvements occur along existing road segments. Mitigation measures should emphasize the establishment of buffers or setbacks between the arterial roadways and adjoining noise-sensitive areas. – Policy N-5.6: Continue to encourage all active railroads within the City to reduce the level of noise produced by train movements within the City.

Policy Title	Summary
	– Policy N-5.7: Encourage all active railroads within the City to schedule trains during daylight hours when possible. – Policy N-5.8: Encourage the Public Utilities Commission, Southern California Regional Rail Authority, Union Pacific, Burlington Northern & Santa Fe, Amtrak, and Metrolink to minimize the level of noise produced by train movements and whistle noise within the city by reducing the number of nighttime operations, improving vehicle system technology, and developing improved sound barriers where residences exist next to the track. – Policy N-5.9: Coordinate with the Fullerton Municipal Airport and the Los Alamitos Joint Forces Training Base to continue the implementation of noise control procedures for the airport and create new procedures and policies to reduce noise impacts to the City. – Policy N-5.10: Encourage Caltrans to meet the State standard of 65 dBA CNEL for exterior noise levels for the Artesia Freeway (SR-91) and Santa Ana Freeway (I-5). – Policy N-5.11: Encourage Caltrans to keep the interior residential noise levels below the State standard of 45 dBA CNEL, where appropriate and feasible. – Policy N-5.12: Continue to work with Caltrans to ensure that sound walls or other appropriate mitigations are provided where the Artesia Freeway (SR 91) and Santa Ana Freeway (I-5) abuts residential areas or areas with sensitive receptors within the City. – Policy N-5.13: Encourage Caltrans to develop a range of sound attenuation alternatives to mitigate noise impacts from the Artesia Freeway (SR-91) and Santa Ana Freeway (I-5). ▪ Goal N-6: Noise levels created by the Union Pacific, Southern Pacific, Metrolink, and any other future rail systems located in close proximity to residential and other noise-sensitive land uses will be minimized or reduced. – Policy N-6.1: Work with rail operators to ensure noise impacts are considered and mitigated through proper design, siting, and construction. – Policy N-6.2: Work with rail operators to install and maintain noise mitigation features where operations adversely impact existing or planned residential and other noise-sensitive land uses. – Policy N-6.3: Encourage noise attenuation measures be incorporated into all new development, renovations, and remodels of residential, health care facilities, schools, libraries, senior facilities, and churches in close proximity to existing or known planned rail lines. – Policy N-6.4: Require future rail projects under the City's control to analyze noise impacts and to identify and incorporate noise-reducing features into the project design.
Buena Park Municipal Code (2025)	▪ Section 8.28.020 contains city amendments to Orange County noise regulations. ▪ Section 8.28.040, Loud, disturbing and unnecessary noise prohibited, 4a. Construction or repair activities, stipulates restriction on the timing and use of construction activities unless express written permission is granted by the city engineer. ▪ Title 19 of the Buena Park Municipal Code contains ordinances related to vibration.

Policy Title	Summary
City of Fullerton	
The Fullerton Plan (2025)	▪ Goal 8: Protection from the adverse effects of noise. – P8.1: Noise Reduction Measures: Support regional and subregional efforts to implement projects or programs that abate and/or attenuate noise across jurisdictions, particularly where the source is not under the City's authority. – P8.2 Mobile Sources: Support projects, programs, policies, and regulations to control and abate noise generated by mobile sources. – P8.3 Consideration of Noise in Land Use Decisions: Support projects, programs, policies, and regulations which ensure noise-compatible land use planning recognizing the relative importance of noise sources in order of community impact, the local attitudes towards these sources, and the suburban or urban characteristics of the environment, while identifying noise-sensitive uses. – P8.4 Noise Reduction Measures: Support projects, programs, policies, and regulations to control and abate noise generated by stationary sources. – P8.5 Focus Area Planning: Support projects, programs, policies, and regulations to evaluate ways to ensure noise compatible land use planning as part of community-based planning of Focus Areas. – P8.6 Noise Receptors: Support projects, programs, policies, and regulations to permit uses where the noise level of the surroundings—after taking into account noise insulation features and other control techniques of the use—is not detrimental to the use. – P8.7 Noise Generators: Support projects, programs, policies, and regulations to permit uses and/or activities where the noise generated by the use and/or activity is not detrimental or otherwise a nuisance to the surroundings.
Fullerton Municipal Code (2025)	Chapter 15.90 of the City of Fullerton Municipal Code contains ordinances related to noise: ▪ Section 15.90.030 contains noise standards for the city of Fullerton. ▪ Section 15.90.040 contains exempt activities from noise standards. Chapters 15.17, 15.30, 15.40, and 15.70 contain ordinances related to vibration.
City of Anaheim	
City of Anaheim General Plan (2025)	▪ Goal 1.1: Protect sensitive land uses from excessive noise through diligent planning and regulation. – Policy 1: Update City regulations to adopt Land Use Compatibility for Community Noise Exposure and California Interior and Exterior Noise Standards as appropriate. – Policy 2: Continue to enforce acceptable noise standards consistent with health and quality of life goals and employ effective techniques of noise abatement through such means as a noise ordinance, building codes, and subdivision and zoning regulations. – Policy 3: Consider the compatibility of proposed land uses with the noise environment when preparing, revising, or reviewing development proposals. – Policy 4: Require mitigation where sensitive uses are to be placed along transportation routes to ensure that noise levels are minimized through appropriate means of mitigation thereby maintaining quality of life standards. – Policy 5: Encourage proper site planning and architecture to reduce noise impacts.

Policy Title	Summary
	– Policy 6: Discourage the siting of sensitive uses in areas in excess of 65 dBA CNEL without appropriate mitigation. – Policy 7: Require that site-specific noise studies be conducted by a qualified acoustic consultant utilizing acceptable methodologies while reviewing the development of sensitive land uses or development that has the potential to impact sensitive land uses. ▪ Goal 2.1: Encourage the reduction of noise from transportation-related noise sources such as motor vehicles, aircraft operations, and railroad movements. – Policy 1: Continue to enforce the noise standards of the State Motor Vehicle Code and other State and Federal legislation pertaining to motor vehicle noise. – Policy 3: Require that development generating increased traffic and subsequent increases in the ambient noise level adjacent to noise-sensitive land uses provide appropriate mitigation measures. – Policy 4: Maintain roadways so that the paving is in good condition to reduce noise-generating cracks, bumps, and potholes. – Policy 5: Require sound walls, berms, and landscaping along existing and future freeways and railroad rights-of-way to beautify the landscape and reduce noise, where appropriate. – Policy 6: Encourage the construction of noise barriers by the Public Utilities Commission, Southern California Regional Rail Authority, Union Pacific, Burlington Northern & Santa Fe and Amtrak where residences exist next to the track. – Policy 7: Encourage the Public Utilities Commission, Southern California Regional Rail Authority, Union Pacific, Burlington Northern & Santa Fe and Amtrak to minimize the level of noise produced by train movements and whistle noise within the city by reducing the number of nighttime operations, improving vehicle system technology and developing improved sound barriers where residences exist next to the track. – Policy 8: Encourage the use sound-deadening matting (as opposed to wood) leading to, from and between the rails where public roads cross tracks in residential areas. – Policy 10: Participate in the planning activities of county, regional and state agencies relative to the location of new airports and the assessment of their impact on the environment of the city. – Policy 11: Encourage the development of alternative transportation modes that minimize noise within residential areas. – Policy 12: Monitor proposals for future transit systems and require noise control to be considered in the selection of transportation systems that may affect the city. ▪ Goal 3.1: Protect residents from the effects of “spill over” or nuisance noise emanating from the city’s activity centers. – Policy 1: Discourage new projects located in commercial or entertainment areas from exceeding stationary-source noise standards at the property line of proximate residential or commercial uses, as appropriate. – Policy 2: Prohibit new industrial uses from exceeding commercial or residential stationary-source noise standards at the most proximate land uses, as appropriate. (Industrial noise may spill over to proximate industrial uses so long as the combined noise does not exceed the appropriate industrial standards.) – Policy 3: Enforce standards to regulate noise from construction activities. Particular emphasis shall be placed on the restriction of the hours in which

Policy Title	Summary
	work other than emergency work may occur. Discourage construction on weekends or holidays except in the case of construction proximate to schools where these operations could disturb the classroom environment. – Policy 4: Require that construction equipment operate with mufflers and intake silencers no less effective than originally equipped. – Policy 5: Encourage the use of portable noise barriers for heavy equipment operations performed within 100 feet of existing residences or make applicant provide evidence as to why the use of such barriers is infeasible.
Anaheim Municipal Code (2025)	Chapter 6.70 of the City of Anaheim Municipal Code contains ordinances related to noise. This section describes standard sound levels, violations and penalties, and enforcement powers. Chapters 18.08 and 18.10 contain ordinances related to vibration.

Sources: City of Anaheim 2025a, 2025b; City of Bell 2022, 2024; City of Buena Park 2022, 2025; City of Commerce 2008, 2024; City of Fullerton 2025a, 2025b; City of La Mirada 2003, 2024; City of Los Angeles 2024a, 2024b, 2025; City of Montebello 2024a, 2024b; City of Norwalk 2023, 2024; City of Pico Rivera 2014, 2025; City of Santa Fe Springs 2022, 2025; City of Vernon 2023, 2024; County of Los Angeles 2025a, 2025b; County of Orange 2024, 2025; Los Angeles County Airport Land Use Commission 2004
Caltrans = California Department of Transportation; CEQA = California Environmental Quality Act; CNEL = community equivalent noise level; CSS = Community and Safety Section; dB = decibel; dBA = A-weighted decibel; HVAC = heating, ventilation, and air conditioning; I = Interstate; L_{dn} = day-night sound level; Metro = Los Angeles County Metropolitan Transportation Authority; OSHA = Occupational Safety and Health Administration; SR = State Route

3.4.3 Consistency with Plans and Laws

As indicated in Section 3.1.5.3, Consistency with Plans and Laws, CEQA and NEPA regulations require a discussion of inconsistencies or conflicts between a proposed undertaking and federal, state, regional, or local plans and laws. CEQA and FRA NEPA implementing procedures require the discussion of any inconsistency or conflict between a proposed action and federal, state, regional, or local plans and laws. Where inconsistencies or conflicts exist, the Authority must provide a description of the extent of reconciliation and the reason for proceeding if full reconciliation is not feasible under NEPA (64 *Federal Register* 28545, 14(n)(15)) and must discuss the inconsistencies between the proposed project and applicable general plans, specific plans, and regional plans under CEQA (State CEQA Guidelines Section 15125(d)).

Several federal and state laws and implementing regulations listed in Section 3.4.2.1, Federal, and Section 3.4.2.2, State, govern compliance with noise emission limits for construction projects and for transportation facilities. Because noise and vibration assessment is highly technical, there are several published federal and state guidance documents detailing how to assess potential impacts. The Authority, as the lead agency proposing to build and operate the HSR system, is required to comply with all federal and state laws and regulations and to secure applicable federal and state permits prior to initiating construction of the project. Pursuant to U.S. Code Title 23 Section 327, under the NEPA Memorandum of Understanding between the FRA and the State of California, effective July 22, 2024, the Authority is the federal lead agency for environmental reviews and approvals for all Authority Phase 1 and Phase 2 California HSR System projects. Therefore, there would be no inconsistencies between the Shared Passenger Track Alternatives and these federal and state laws and regulations.

The Authority is a state agency and is therefore not required to comply with local land use and zoning regulations; however, it has endeavored to design and build the HSR project so that it is consistent with land use and zoning regulations.

Counties and cities in California prepare general plans with noise policies and ordinances (outlined above in the discussion of state regulations). These noise elements often incorporate specific allowable noise levels to achieve a quality environment. Where airports exist, the general plans often include a section on airport land use compatibility with respect to noise so that new, noise-sensitive uses are not located near or do not encroach on areas surrounding airports. General plans usually do not address ground-borne vibration. The HSR project is not subject to

local general plan policies and ordinances related to noise limits on construction or to locally based criteria for determining the effects and significance of a noise increase from a project.

The Shared Passenger Track Alternatives would be inconsistent with certain provisions of the regional and local policies and plans that include local noise standards and limits as described in Table 3.4-3.

Table 3.4-3 Regional and Local Plans and Policies Inconsistencies

Policy/Goal/Objective	Inconsistencies
County of Los Angeles: Noise Ordinance	May not be possible to meet standards
Los Angeles County Code of Ordinances: Section 12.08.350	May not be possible to meet standards
City of Vernon General Plan: Noise Element	May not be possible to meet standards
The Code of the City of Vernon: Section 26.4.1-7	May not be possible to meet standards
The Code of the City of Vernon: Section 26.4.1-7	May not be possible to meet standards
Commerce Municipal Code: Section 19.19.180	May not be possible to meet standards
Montebello Municipal Code Section 17.32.170	May not be possible to meet standards
Code of Santa Fe Springs	May not be possible to meet standards

Sources: City of Commerce 2024; City of Montebello 2024b; City of Santa Fe Springs 2025; City of Vernon 2023, 2024; County of Los Angeles 2025a

Although it may not be possible to meet all local noise and vibration standards (which include limits that may not always be practical to achieve for transportation sources), the IAMFs will minimize the impacts and ultimately meet the overall objectives of the local policies.

Refer to Appendix 3.1-A for a complete consistency analysis of local plans and policies.

3.4.4 Methods for Evaluating Impacts

The following sections summarize the RSAs and the methods used to analyze noise and vibration impacts. As summarized in Section 3.4.1, Introduction, nine other sections provide additional information related to noise and vibration resources.

3.4.4.1 Noise and Vibration Analysis Methodology

Evaluation of noise and vibration effects is a requirement of the Noise Emission Compliance Regulation adopted by the USEPA, NEPA, the California Noise Control Act of 1973 (California Health and Safety Code, Section 46010 et seq.), and CEQA. Noise and vibration impacts for the Shared Passenger Track Alternatives were analyzed using the following procedures:

- The methods and criteria for evaluating high-speed ground transportation noise and vibration impacts are found in the FRA's *High-Speed Ground Transportation Noise and Vibration Impact Assessment* guidance manual (FRA 2012).
- The methods and criteria for evaluating non-high-speed transit noise and vibration impacts are found in FTA's *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).
- The criteria for highway noise impacts (relevant to the extent HSR causes changes in traffic patterns) are included in FHWA's *Procedures for Abatement of Highway Traffic Noise and Construction Noise* (23 CFR Part 772). The FHWA procedures are implemented as defined by the Caltrans *Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects* (Caltrans 2020). FHWA requires each state to write its own noise policy, based upon FHWA's *Highway Traffic Noise: Analysis and Abatement Guidance* (FHWA 2011). The state policy must address the issues of (1) required noise reduction needed for a wall to be reasonable, (2) cost of a reasonable wall, and (3)

noise level reduction required for a receiver to be considered benefited. The Caltrans *Traffic Noise Analysis Protocol* addresses these issues. Caltrans' *Technical Noise Supplement to the Caltrans Traffic Noise Analysis Protocol* (Caltrans 2013) gives guidance on how Caltrans requires noise measurements, modeling, and barrier analyses to be done. Caltrans' Standard Environmental Reference Volume 1 on Noise gives an outline for the noise report.

Noise and vibration measurements collected within the RSAs for the project were used to characterize existing conditions at noise- and vibration-sensitive receiver locations, for the purpose of applying FRA and FTA criteria. Project section information was used in noise and vibration models.

The *Los Angeles to Anaheim Project Section Noise and Vibration Technical Report* (Authority 2025) contains specific procedures used to assess effects from construction and operation of the project.

3.4.4.2 Definition of Resource Study Areas

As defined in Section 3.1, RSAs are the geographic boundaries in which the Authority conducted environmental investigations specific to each resource topic. The RSAs for noise and vibration impacts define the areas in which environmental investigations specific to noise and vibration are conducted to determine the resource characteristics and potential effects of the Shared Passenger Track Alternatives. The boundaries of the RSAs extend beyond the project footprint, because the effects analysis focuses on effects of source noise and vibration on sensitive receivers, which is assessed at the receiver. The same RSAs apply to both direct and indirect impacts. Direct impacts consist of increases in noise and vibration as a result of project operation, and indirect impacts for noise include the project's impact on traffic patterns, which indirectly affect noise levels. Table 3.4-4 provides a general definition and boundary description for each RSA within the project section, based on the applicable FRA and FTA noise and vibration impact screening distances. Figure 3.4-2 and Figure 3.4-3 depict the noise and vibration RSAs.

To identify areas that could be affected by noise from the Shared Passenger Track Alternatives, the locations of noise-sensitive areas (NSA) were determined by segmenting the corridor into areas between major road crossings that include clusters of noise-sensitive receivers. The Authority identified 46 NSAs and conducted ambient noise measurements at 45 sites throughout the noise RSA along the proposed HSR alignment. As described in Section 5.2.1, Noise-Sensitive Receptors, of the *Los Angeles to Anaheim Project Section Noise and Vibration Technical Report*, the results of the noise measurements were used to characterize the existing noise conditions at the NSAs. However, measurements were not taken at all NSAs. Rather, the measurement results at a given site were sometimes used to represent the existing conditions at more than one NSA, and the results at some sites were not used. Therefore, the number of measurement sites and number of NSAs are not the same. The Authority collected long-term (24- to 48-hour) measurements at 30 sites and short-term (1-hour) measurements at 15 sites. The Authority then used the measurement results at these locations to characterize the existing noise conditions at particular NSAs, as noted in Chapter 5, Affected Environment, of the *Los Angeles to Anaheim Project Section Noise and Vibration Technical Report* (Authority 2025).

To identify areas that could be affected by vibration from the project, the locations of vibration-sensitive areas (VSA) were determined by segmenting the corridor into areas between major road crossings that include clusters of vibration-sensitive receivers. The Authority identified 46 VSAs and conducted vibration propagation measurements at 11 sites throughout the vibration RSA to determine the transmission of vibration from its source (propagation measurements are used to determine the response of the ground from a vibration source at a specific location). As described in Section 5.4.1, Vibration-Sensitive Receptors, of the *Los Angeles to Anaheim Project Section Noise and Vibration Technical Report*, the results of the vibration measurements were used to characterize the existing vibration conditions at the VSAs. However, measurements were not taken at all VSAs. Rather, the measurement results at each site were used to represent the existing conditions at multiple VSAs in the vicinity of the site. Therefore, the number of measurement sites and number of VSAs are not the same. The Authority then used the measurement results at these locations to characterize the ground vibration propagation

conditions at particular VSAs. Vibration test results are presented in the *Los Angeles to Anaheim Project Section Noise and Vibration Technical Report* (Authority 2025).

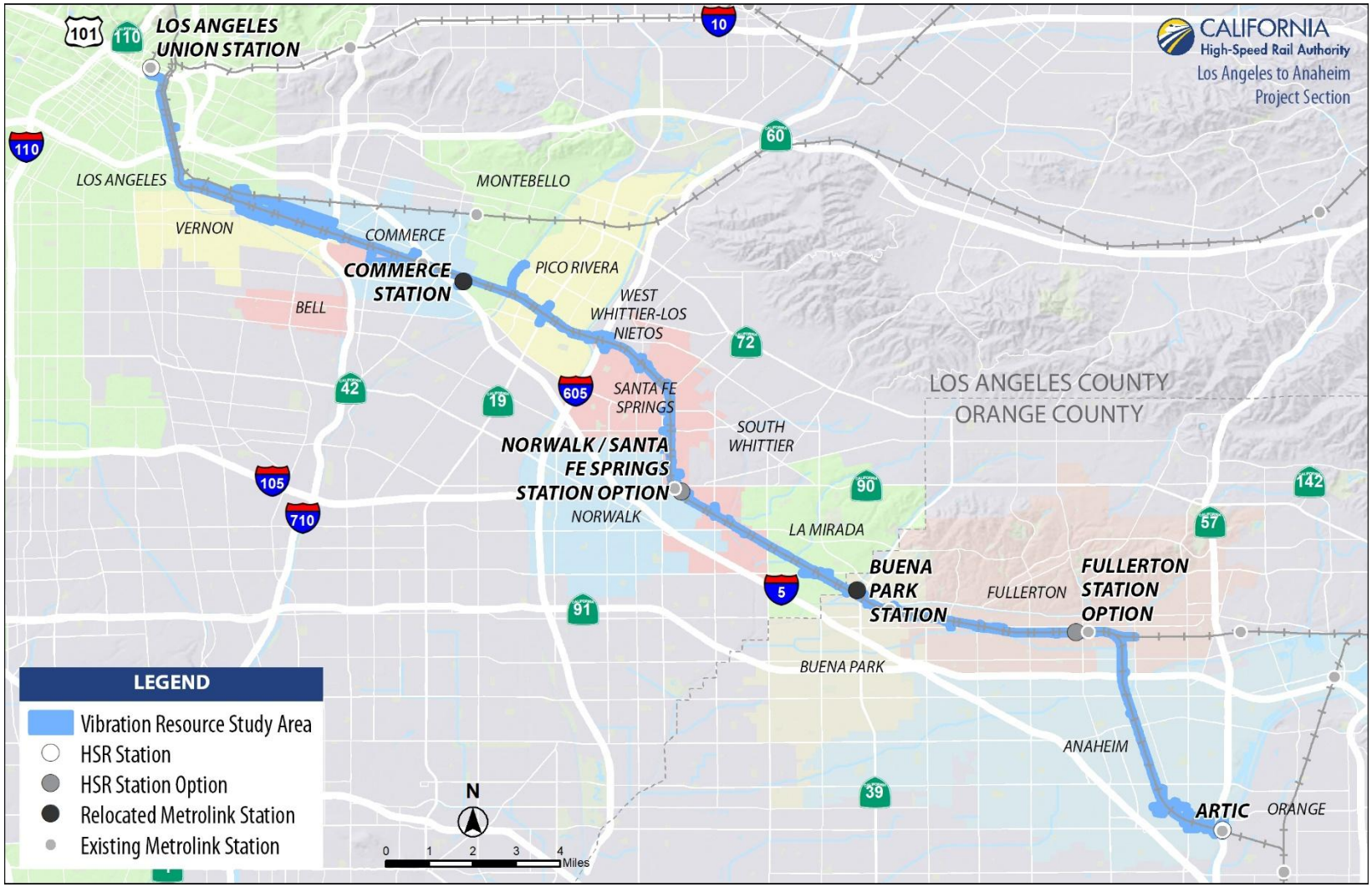
Table 3.4-4 Definition of Noise and Vibration Resource Study Areas

General Definition	Resource Study Area Boundary
Noise	
Operations	Alignment RSA: For direct and indirect noise effects on sensitive receivers, the FRA defines the screening distance as 700 feet from the centerline of the rail corridor for steel-wheeled vehicles operating on new or existing track at any speed and frequency in a suburban or nonsuburban setting with an unobstructed view (FRA 2012). This is used as the RSA for the noise analysis for rail operation, because elevated track sections may result in an unobstructed view of trains for receivers at this distance from the track. This RSA has been determined based on typical screening distances as defined by the FRA and project-specific factors of the project section. Station RSA: 250 feet from the station boundary, which corresponds to the screening distance for commuter rail stations (FTA 2018) Maintenance Facility RSA: 1,000 feet from the facility boundary, which corresponds to the screening distance for this type of facility (FTA 2018)
Construction	Daytime (7 a.m. to 10 p.m.): 645 feet from construction activity, which corresponds to the estimated worst-case impact distance for daytime construction (Table 3.4-13) Nighttime (10 p.m. to 7 a.m.): 2,038 feet from construction activity, which corresponds to the estimated worst-case impact distance for nighttime construction (Table 3.4-13)
Vibration	
Operations	Station RSA: 150 feet from the station boundary, which corresponds to light rail transit sources for residential (Category 2) land use (FTA 2018) Alignment RSA, including existing railroads: up to 275 feet from the edge of the right-of-way, which corresponds to the maximum screening distance for more than 70 pass-bys per day in a residential area (FRA 2012)
Construction	500 feet from construction activity, which corresponds to the estimated worst-case impact distance (Table 3.4-15)

FRA = Federal Railroad Authority; RSA = resource study area

Source: ESRI 2024
Preliminary draft; alignment subject to change.

Figure 3.4-2 Noise Resource Study Area



Source: ESRI 2024
Preliminary draft; alignment subject to change.

Figure 3.4-3 Vibration Resource Study Areas

3.4.4.3 Impact Avoidance and Minimization Features

The Shared Passenger Track Alternatives incorporate standardized HSR features to avoid and minimize impacts that are considered to be a part of the project. These features are referred to as IAMFs. The Authority will apply IAMFs during project design and construction; therefore, the analysis of impacts of the project in this section factors in applicable IAMFs. The IAMFs differ from mitigation measures in that they are part of the project regardless of whether an impact is identified in this document. In contrast, mitigation measures may be available to further reduce, compensate for, or offset project impacts that the analysis identifies under NEPA or concludes are significant under CEQA.

Appendix 2-A provides a detailed description of IAMFs that are included as part of the project design. IAMFs applicable to noise and vibration include:

NV-IAMF#1, Noise and Vibration. Prior to construction, the Authority-designated contractor shall prepare and submit to the Authority a noise and vibration technical memorandum documenting how the FTA and FRA guidelines for minimizing construction noise and vibration impacts will be employed when work is being conducted within 1,000 feet of sensitive receptors. Typical construction practices contained in the FTA and FRA guidelines for minimizing construction noise and vibration impacts include the following:

- Build noise barriers, such as temporary walls or piles of excavated material, between noisy activities and noise sensitive resources.
- Route truck traffic away from residential streets, when possible.
- Build walled enclosures around especially noisy activities or around clusters of noisy equipment.
- Combine noisy operations so that they occur in the same time period.
- To reduce vibration, schedule demolition, earthmoving, and ground-impacting operations so as not to occur in the same time period. Unlike noise, the total vibration level produced could be substantially less when each vibration source operates separately.
- Avoid impact pile driving where possible in vibration-sensitive areas.

3.4.4.4 Methods for Impact Analysis

This section describes the sources and methods the Authority used to analyze potential impacts from implementing the Shared Passenger Track Alternatives from noise and vibration. These methods apply to both NEPA and CEQA analyses unless otherwise indicated. Refer to Section 3.1.5.4, Methods for Evaluating Impacts, for a description of the general framework for evaluating impacts under NEPA and CEQA. Refer to the *Los Angeles to Anaheim Project Section Noise and Vibration Technical Report* (Authority 2025) for information regarding the methods and data sources used in this analysis. Laws, regulations, and orders (refer to Section 3.4.2, Laws, Regulations, and Orders) that regulate noise and vibration resources were also considered in the evaluation of impacts on noise and vibration resources.

For the purposes of analysis in this document, FRA and FTA guidelines were used to conduct a detailed assessment of noise and vibration effects at sensitive receivers. Exceedance of recommended limits in the FRA and FTA guidance documents were assessed to determine effects under NEPA and CEQA.

Depending on the magnitude of the proposed project's noise increase, the FTA and the FRA categorize impacts as: (1) no impact, (2) moderate impact, or (3) severe impact. A severe impact is defined as the level at which a large percentage of people would be highly annoyed by the project's noise. A moderate impact is defined as the point at which the change in the cumulative noise level would be noticeable to most people but may not be sufficient to generate strong, adverse reactions.

For project construction and operational actions that would result in severe noise impacts or vibration impacts, feasible mitigation measures are identified to avoid or minimize effects or to compensate for effects. Only after consideration of mitigation measures would CEQA effects be determined.

For effects analysis, the following thresholds were used in assessing locations with effects:

- FRA noise impact criteria for project operation, as depicted on Figure 3.4-4 and Figure 3.4-5
- FRA detailed analysis vibration impact criteria for HSR operation, as defined in Figure 3.4-6, Table 3.4-9, and Table 3.4-10
- FRA construction noise impact criteria, as defined in Table 3.4-5
- FRA construction vibration impact criteria, as defined in Table 3.4-8
- FHWA NAC for traffic (on roadways affected by the project section)
- FTA noise impact criteria for ancillary and non-HSR noise sources, as depicted on Figure 3.4-4 and Figure 3.4-5

The Authority used the methods below to evaluate noise and vibration impacts from construction and operations.

Construction Noise

Construction noise effects are assessed using a combination of the methods and construction source data contained in the FRA manual (FRA 2012) and the FHWA Roadway Construction Noise Model (FHWA 2006). The prediction of construction noise is based on the noise emissions from equipment expected to be used for each phase of construction. To be conservative, the noise estimates did not assume shielding because of topography or ground effects.

Although the FTA and the FRA do not specify standardized criteria for construction noise limits, the FTA and FRA guidance documents provide guidelines for impact assessment, which are intended to minimize or avoid adverse community reaction. This guidance is used in the analysis, because this is a project undertaken by FRA.

Table 3.4-5 presents the FRA noise assessment thresholds for construction. The last column applies to construction activities that extend over 30 days near any given receiver. L_{dn} is used to assess effects in residential areas and 24-hour equivalent sound level (L_{eq}) is used in commercial and industrial areas. The 8-hour L_{eq} and the 30-day average L_{dn} noise exposure from construction noise calculations use the noise emission levels of the construction equipment, their locations, and operating hours.[1]

Table 3.4-5 Federal Railroad Administration Construction Noise Assessment Criteria

Land Use	8-hour L_{eq} (dBA)		L_{dn} (dBA)
	Day	Night	30-Day Average
Residential	80	70	75
Commercial	85	85	80[1]
Industrial	90	90	85[1]

Source: FRA 2012
[1] 24-hour L_{eq}, not L_{dn}
dBA = A-weighted decibels; L_{dn} = day-night sound level; L_{eq} = equivalent sound level

[1] Refer to Section 5.1.2 of the *Los Angeles to Anaheim Project Section Noise and Vibration Technical Report* (Authority 2024) for a discussion of noise descriptors.

With respect to quantifying the number of affected sensitive receivers from construction activities, a weighted average of the impact screening distances for all construction activities was used. Each impact distance was weighted based on the length of the project corridor along which sensitive receivers would be exposed to noise from each construction activity. For instance, the distance from which at-grade rail construction could affect sensitive receivers, although less than other construction activities, was weighted most heavily, because it would affect sensitive receivers along 23.8 miles of the project corridor. The more extensive noise impact distances associated with louder construction activities at fixed locations (e.g., at-grade separations or stations) were weighted less heavily, because they would affect sensitive receivers adjacent to shorter segments of the project corridor (on the order of 500 to 2,000 feet in length at each location). The foregoing approach is conservative and resulted in weighted average impact screening distances of approximately 150 feet for daytime construction activities and approximately 600 feet for nighttime construction. A geographic information system inventory of sensitive receivers within these distances from the project corridor was used to estimate the total number of potential noise impacts for both daytime and nighttime construction activities. Additional site-specific analysis was completed for three of the proposed grade-separation areas where there would be heavy levels of construction activities in proximity to sensitive receivers: Pioneer Boulevard, Norwalk Boulevard, and State College Boulevard. For these three grade-separation locations, the number of affected sensitive receivers within 355 feet of daytime construction activities and 1,123 feet of nighttime construction activities is identified. Sensitive receivers that could be affected by construction noise activities do not occur at the remaining proposed grade separations.

Operational Noise

Noise from project operations was projected using the prediction methodology provided in the FRA's *High-Speed Ground Transportation Noise and Vibration Impact Assessment* (FRA 2012) based on the following assumptions:

- Trains consisting of eight high-speed electric-powered multiple power units, with a total train length of 660 feet
- Train speeds that vary with location based on speed profiles, with a maximum speed of 90 mph within this project section
- Train volumes, hours of operation, and headways based on the timetable information provided by the project team

In addition, the changes in noise caused by the project-related relocation of freight tracks within the right-of-way were evaluated based on the changes in distance between the freight tracks and nearby sensitive receivers using FRA methodology.

Federal Railroad Administration Guidance

The FRA criteria for assessing noise impacts from HSR operations (FRA 2012) are identical to those contained in the FTA guidance document for rail projects (FTA 2018). These criteria are discussed in the section below.

Noise impacts on wildlife and livestock are not found in the FTA guidance document but are addressed in the FRA guidelines. Similarly, the FRA provides guidelines for identifying noise-sensitive locations where increased annoyance can occur because of the sudden increase in noise (the startle effect) from the rapid approach of HSR. Criteria for these effects are presented in the *Los Angeles to Anaheim Project Section Noise and Vibration Technical Report* (Authority 2025).

Federal Transit Administration Guidance

The noise impact criteria for rail projects and their associated fixed facilities, such as storage and maintenance yards, passenger stations and terminals, parking facilities, and substations, depend on the category of land use. Land use categories defined by the FTA are presented in Table 3.4-6. These land use categories are separated into three categories with varying metrics

for transit noise impact criteria: (1) tracts of land where quiet is an essential element in their intended purpose, (2) residences and buildings where people normally sleep where nighttime sensitivity is assumed to be of utmost importance, and (3) institutional land uses with primarily daytime and evening use where it is important to avoid interference with activities such as speech, meditation, and concentration. The noise criteria for land use categories are depicted graphically on Figure 3.4-4.

For noise exposures below the lower of the two curves on Figure 3.4-4, a proposed project is considered to have no noise impact because, on average, the introduction of the project would result in an insignificant increase in the number of people highly annoyed by the new noise. The curve defining the onset of noise effects stops increasing at 65 dBA for Category 1 and Category 2 land uses, a standard limit for an acceptable living environment defined by a number of federal, state, and local agencies. Project noise above the upper curve is considered to cause a severe impact because a substantial percentage of people would be highly annoyed by the new noise.

The upper curve on Figure 3.4-4 flattens out at 75 dBA for Category 1 and Category 2 land uses, a level associated with an unacceptable living environment. As indicated by the right-hand scale on Figure 3.4-4, the project noise criteria are 5 dB higher for Category 3 land uses because these types of land uses are considered to be slightly less sensitive to noise than the types of land uses in Category 1 and Category 2.

Between the two curves, a project is judged to have a moderate effect. The change in the cumulative noise level is noticeable to most people, but may not be sufficient to cause strong, adverse reactions from the community. In this transitional area, other project-specific factors must be considered to determine the magnitude of the effect and the need for mitigation, such as the existing noise level, predicted level of increase over existing noise levels, and the types and numbers of noise-sensitive land uses affected.

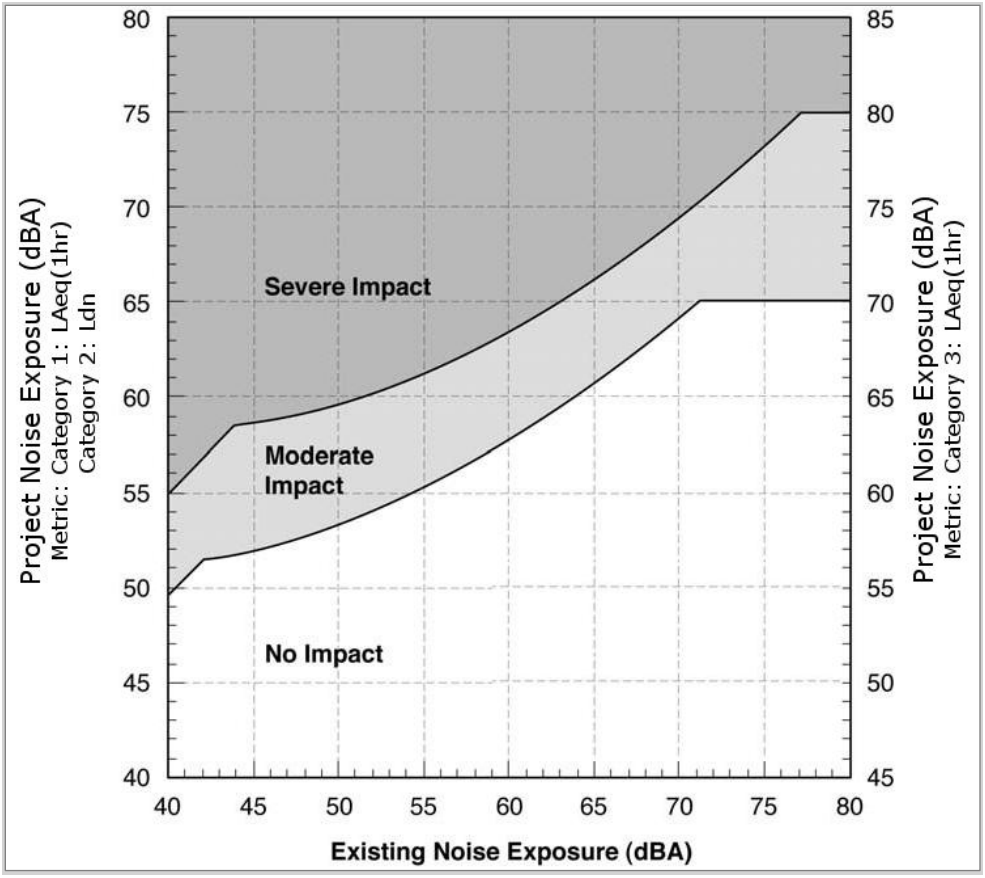
Table 3.4-6 Land Use Categories and Metrics for Transit Noise Impact Criteria

Land Use Category	Noise Metric (dBA)	Land Use Category
1	Outdoor $L_{eq}(h)$[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	Outdoor L_{dn}	This category is applicable to residential land use and buildings where people normally sleep, such as hotels and hospitals.
3	Outdoor $L_{eq}(h)$[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} for the noisiest hour of transit-related activity during hours of noise sensitivity.

dBA = A-weighted decibels; L_{dn} = day-night sound level; L_{eq} = equivalent sound level; $L_{eq}(h)$ = hourly equivalent sound level



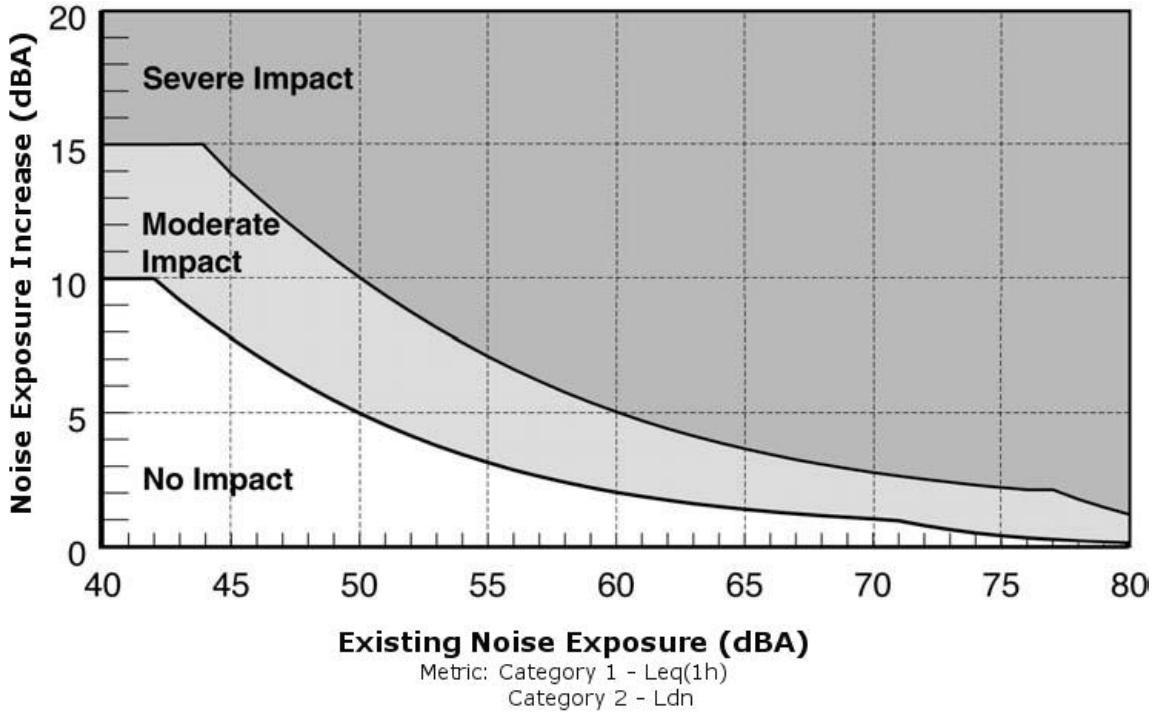
Sources: FTA 2018; FRA 2012

Figure 3.4-4 Noise Impact Criteria for Transit and High-Speed Rail Projects

Although the curves on Figure 3.4-4 are defined in terms of the project noise exposure and the existing noise exposure, the increase in the cumulative noise—when project-generated noise is added to existing noise levels—is the basis for the criteria. To illustrate this point, Figure 3.4-5 provides the noise impact criteria for Category 1 and Category 2 land uses in terms of the allowable increase in the cumulative noise exposure. Because L_{dn} and L_{eq} are measures of total acoustic energy, new noise sources in a community would cause an increase, even if the new source level is lower than the existing level. On Figure 3.4-5, the criterion for a moderate effect allows a noise exposure increase of 10 dBA if the existing noise exposure is 42 dBA or less, but only a 1-dBA increase when the existing noise exposure is 70 dBA.

As the existing level of ambient noise increases, the allowable level of transit noise increases, but the total amount that community noise exposure is allowed to increase is reduced. This accounts for the unexpected result that a project noise exposure that is lower than the existing noise exposure can still cause an effect. This is demonstrated by the examples given in Table 3.4-7, which indicate the level of transit noise allowed for different existing levels of exposure. Any increase greater than indicated in the table would cause moderate impacts for Category 1 or Category 2 land use.

With respect to construction noise, no standard criteria apply at the federal level. However, Section 12.1.3 of the FTA guidance document does offer suggested threshold values for two levels of analysis (general and detailed) that can help identify noise impacts from construction equipment (FTA 2018).



Sources: FTA 2018; FRA 2012

Figure 3.4-5 Allowable Increase in Cumulative Noise Levels (Categories 1 and 2)

Table 3.4-7 Noise Impact Criteria: Effect on Cumulative Noise Exposure

L_{dn} or L_{eq} in dBA (rounded to nearest whole decibel)			
Existing Noise Exposure	Allowable Project Noise Exposure	Allowable Combined Total Noise Exposure	Allowable Noise Exposure Increase
45	51	52	7
50	53	55	5
55	55	58	3
60	57	62	2
65	60	66	1
70	64	71	1
75	65	75	0

Source: FTA 2018
dBA = A-weighted decibels; L_{dn} = day-night sound level; L_{eq} = equivalent sound level

Federal Highway Administration Procedures for Abatement of Highway Traffic Noise and Construction Noise (23 CFR Part 772)

The FHWA stipulates procedures and criteria for noise assessment studies of highway projects funded or approved by FHWA (23 CFR Part 772). For projects subject to those regulations, the FHWA requires that noise abatement measures be considered on federal-aid highway projects if the project would cause a substantial increase in noise levels, or if projected noise levels approach or exceed the NAC level for activities occurring on adjacent lands.

Highway traffic noise generally becomes an important consideration where there is a new roadway project, a roadway is designed to increase capacity, or there is a significant horizontal or vertical alteration in an existing roadway. Although the project would result in roadway modifications, these modifications would result in a noise increase of less than 3 dB (which would generally not be perceptible) or likely a decrease in noise relative to existing levels (Authority 2025). Therefore, effects from traffic noise are not anticipated for the project and are not considered further in the analysis.

Construction Vibration

Construction vibration effects are assessed using the methods and construction source data contained in the FRA manual (FRA 2012) based on the equipment expected to be used during construction. The FRA provides construction vibration criteria designed primarily to prevent building damage, and to assess whether vibration might interfere with vibration-sensitive building activities or temporarily annoy building occupants during the construction period. The FRA criteria include two ways to express vibration levels: (1) root mean square vibration decibels (VdB) for annoyance and activity interference, and (2) peak particle velocity, which is the maximum instantaneous peak of a vibration signal used for assessments of building damage potential.

To avoid temporary annoyance to building occupants during construction or construction interference with vibration-sensitive equipment inside special-use buildings, such as a magnetic resonance imaging machine, the FRA recommends using the long-term vibration criteria provided under Operational Vibration.

Table 3.4-8 presents the FRA building damage criteria for construction activity; the table lists peak particle velocity limits for four building categories. These limits are used to estimate potential problems that should be addressed during final design.

Table 3.4-8 Federal Railroad Administration Construction Vibration Damage Criteria

Building Category	PPV (inch per second)	Approximate Lv[1]
I. Reinforced concrete, steel, or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Nonengineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

Source: FRA 2012
[1] Root mean square vibration velocity level in vibration decibels relative to 1 micro-inch per second.
Lv = velocity level in decibels; PPV = peak particle velocity

Operational Vibration

Vibratory motion of the ground at a specific location caused by HSR operations may result in two forms of human annoyance. Ground-borne vibration is tactile movement of the ground or structures, whereas ground-borne noise is the radiation of acoustical energy from ground and structural surfaces excited by ground-borne vibration. Broadly speaking, vibration impact criteria levels are influenced by land use category and vibration event frequency (i.e., how often a train passes within a given time period).

Federal Railroad Administration Guidelines

The FRA guidelines (FRA 2012), which acknowledge the FTA guidance document (FTA 2018) as their basis, provide ground-borne vibration and noise criteria for a general assessment as presented in Table 3.4-9. In addition, the guidelines provide criteria for special buildings that are very sensitive to ground-borne noise and vibration. The impact criteria for these special buildings are presented in Table 3.4-10. Ground-borne vibration and noise criteria are also assigned based on categories of land use, which are defined in Table 3.4-9. These levels represent the maximum root mean square level of a train event.

Both Table 3.4-9 and Table 3.4-10 differentiate the vibration impact threshold depending on the number of vibration events per day, with fewer than 30 vibration events per day considered "infrequent," between 30 and 70 vibration events considered "occasional," and more than 70 events considered "frequent" for Table 3.4-9. For Table 3.4-10, fewer than 70 vibration events per day are considered "occasional or infrequent" and more than 70 events are considered "frequent." This dividing line was originally selected so that most commuter rail or intercity rail projects would fall into the "infrequent" category and most urban transit projects (subway and light rail transit) would more typically be in the "frequent" category.

For a detailed vibration analysis, more refined impact criteria are required than for a general assessment. Therefore, the criteria for a detailed vibration assessment are expressed in terms of one-third octave band frequency spectra, based on international and industry standards. The FRA criteria for a detailed vibration assessment are depicted on Figure 3.4-6, and descriptions of the curves are provided in Table 3.4-11. The curves are applied to the projected vibration spectrum for the project section. If the vibration level at any frequency exceeds the criteria, there would be an impact. Conversely, if the entire proposed vibration spectrum of the project section were below the curve, there would be no impact.

Table 3.4-9 Ground-Borne Vibration and Noise Impact Criteria

Land Use Category	Ground-Borne Vibration Impact Levels (VdB re 1 micro-inch per second)			Ground-Borne Noise Impact Levels (dBA re 20 micro-Pascals)		
	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1: Buildings where vibration would interfere with interior operations	65 VdB[4]	65 VdB[4]	65 VdB[4]	N/A[5]	N/A[5]	N/A[5]
Category 2: Residences and buildings where people normally sleep	72 VdB	75 VdB	80 VdB	35 dBA	38 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use	75 VdB	78 VdB	83 VdB	40 dBA	43 dBA	48 dBA

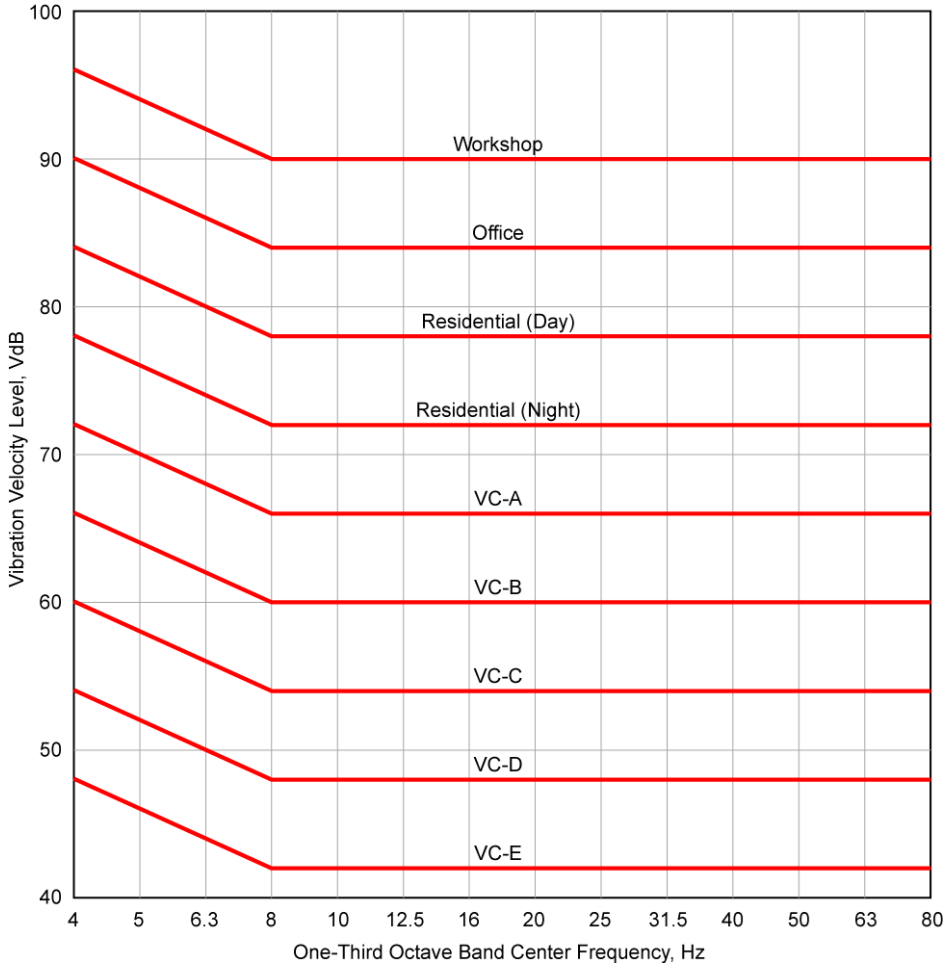
Source: FRA 2012
[1] Frequent events are defined as more than 70 vibration events of the same kind per day.
[2] Occasional events are defined as between 30 and 70 vibration events of the same kind per day.
[3] Infrequent events are defined as fewer than 30 vibration events of the same kind per day.
[4] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment, such as optical microscopes. For vibration-sensitive manufacturing or research equipment, a detailed vibration analysis must be performed.
[5] Vibration-sensitive equipment is generally not sensitive to ground-borne noise.
dBA = A-weighted decibels; N/A = not applicable; VdB = vibration decibels

Table 3.4-10 Ground-Borne Vibration and Noise Impact Criteria for Special Buildings

Type of Building or Room	Ground-Borne Vibration Impact Levels (VdB re 1 micro-inch per second)		Ground-Borne Noise Impact Levels (dBA re 20 micro-Pascals)	
	Frequent Events[1]	Occasional or Infrequent Events[2]	Frequent Events[1]	Occasional or Infrequent Events[2]
Concert Halls	65 VdB	65 VdB	25 dBA	25 dBA
TV Studios	65 VdB	65 VdB	25 dBA	25 dBA
Recording Studios	65 VdB	65 VdB	25 dBA	25 dBA
Auditoriums	72 VdB	80 VdB	30 dBA	38 dBA

Type of Building or Room	Ground-Borne Vibration Impact Levels (VdB re 1 micro-inch per second)		Ground-Borne Noise Impact Levels (dBA re 20 micro-Pascals)	
	Frequent Events[1]	Occasional or Infrequent Events[2]	Frequent Events[1]	Occasional or Infrequent Events[2]
Theaters	72 VdB	80 VdB	35 dBA	43 dBA

Source: FRA 2012
[1] Frequent events are defined as more than 70 vibration events per day.
[2] Occasional or infrequent events are defined as fewer than 70 vibration events per day.
dBA = A-weighted decibels; N/A = not applicable; VdB = vibration decibels



Source: FRA 2012

Figure 3.4-6 Federal Railroad Administration Detailed Ground-Borne Vibration Impact Criteria

Table 3.4-11 Interpretation of Vibration Criteria for Detailed Analysis

Criterion Curve (Figure 3.4-6)	Max Lv (VdB)[1]	Description of Use
Workshop	90	Distinctly feelable vibration. Appropriate to workshops and nonsensitive areas.
Office	84	Feelable vibration. Appropriate to offices and nonsensitive areas.

Criterion Curve (Figure 3.4-6)	Max Lv (VdB)[1]	Description of Use
Residential Day	78	Barely feelable vibration. Adequate for computer equipment and low-power optical microscopes (up to 20X).
Residential Night, Operating Rooms	72	Vibration not feelable, but ground-borne noise may be audible inside quiet rooms. Suitable for medium-power optical microscopes (100X) and other equipment of low sensitivity.
VC-A	66	Adequate for medium- to high-power optical microscopes (400X), microbalances, optical balances, and similar specialized equipment.
VC-B	60	Adequate for high-power optical microscopes (1000X), and inspection and lithography equipment to 3-micron line widths.
VC-C	54	Appropriate for most lithography and inspection equipment to 1-micron detail size.
VC-D	48	Suitable in most instances for the most demanding equipment, including electron microscopes operating to the limits of their capability.
VC-E	42	The most demanding criterion for extremely vibration-sensitive equipment.

Source: FRA 2012
[1] As measured in 1/3-octave bands of frequency over the frequency range 8 to 80 Hertz
Lv = velocity level in decibels; VdB = vibration decibels

3.4.4.5 Method for Evaluating Impacts Under NEPA

NEPA implementing procedures, regulations, and guidance provide the basis for evaluating project effects (as described in Section 3.1.1). The criteria of context and intensity are considered together when determining the severity of changes introduced by the project:

- **Context:** For this analysis, the *context* for noise impacts is the background noise and sensitivity of receptors. Rural residential has less noise and fewer receptors versus urban residential near existing noise emitters, such as railroads and freeways. For vibration analysis, the context is the existing land use.
- **Intensity:** For this analysis, *intensity* is determined by assessing the degree to which construction and operations of the project would change noise and vibration levels, using FRA guidelines (refer to impact criteria for noise and vibration in Section 3.4.4.4). These guidelines contain criteria for determining whether project-generated noise or vibration would result in an impact and of what severity.

3.4.4.6 Method for Determining Significance Under CEQA

CEQA requires that an EIR identify the significant environmental impacts of a project (State CEQA Guidelines Section 15126). One of the primary differences between NEPA and CEQA is that CEQA requires a significance determination for each impact using a threshold-based analysis (refer to Section 3.1.5.4 for further information). Accordingly, Section 3.4.9, CEQA Significance Conclusions, summarizes the significance of the environmental impacts on noise and vibration for the Shared Passenger Track Alternatives. The Authority is using the following thresholds to determine if a significant impact from noise and vibration would occur as a result of the project. For the CEQA analysis, the project would result in a significant impact if it would:

- Generate temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of FRA/FTA and FHWA standards for severe noise impacts
- Generate temporary or permanent ground-borne vibration or ground-borne noise levels exceeding FRA/FTA standards

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

As discussed in Section 3.4.4.4, the analysis relies on noise and vibration standards developed by FTA and FRA to determine whether the project would result in significant noise or vibration impacts. These standards are derived primarily from the FRA guidelines in *High-Speed Ground Transportation Noise and Vibration Impact Assessment* (FRA 2012), which is based on the FTA *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018). The noise impact criteria established in these documents is based on the level of human annoyance, and were developed to apply to a wide variety of surface transportation modes and to respond to the varying sensitivities of communities to projects under different background noise conditions. The vibration standards address both human reaction to vibration as well as the potential for physical damage. The FRA standards were developed specifically for assessing noise and vibration impacts caused by HSR projects, and the FTA standards were developed for rail projects and their associated stationary facilities. Accordingly, these standards serve as appropriate thresholds for determining whether the project would result in significant noise or vibration impacts.

For determining the significance of impacts related to traffic noise, the analysis relies in part on criteria that are included in the FHWA's Procedures for Abatement of Highway Traffic Noise and Construction Noise (23 CFR Part 772), which are implemented by Caltrans through its Traffic Noise Analysis Protocol (Caltrans 2020). These criteria are based on the level of human perception or annoyance and consider various types of land uses. Although the FHWA regulations only apply to projects funded or approved by FHWA, the criteria in these regulations are regularly considered in assessing noise impacts associated with motor vehicles. Moreover, the Caltrans Traffic Noise Analysis Protocol provides policy guidance for assessing traffic noise impacts as well as NAC. Therefore, the criteria provided in these documents serve as appropriate thresholds for determining whether traffic noise would result in a significant impact.

3.4.5 Affected Environment

This section describes the affected environment for noise and vibration in the RSA. This information provides the context for the environmental analysis and evaluation of impacts.

A summary of stakeholder issues and concerns from public outreach efforts can be found in Chapter 9, Public and Agency Involvement.

The project would travel on an existing and historical rail corridor through highly urbanized residential, commercial, and industrial settings. Transportation rights-of-way, including the existing Los Angeles County Metropolitan Transportation Authority, BNSF Railway (BNSF), and Orange County Transportation Authority corridors, interstates, highways, state routes, and local roads, are the largest land use in the RSA, followed by residential uses. From north to south along the project route, the RSA includes urban and suburban development in Los Angeles and Orange Counties and the cities of Los Angeles, Vernon, Commerce, Bell, Montebello, Pico Rivera, Santa Fe Springs, Norwalk, La Mirada, Buena Park, Fullerton, and Anaheim.

Noise measurements were made at 45 sites at or near noise-sensitive locations (primarily residential or institutional), and detailed site descriptions are included in the *Los Angeles to Anaheim Project Section Noise and Vibration Technical Report* (Authority 2025). Results of the noise measurements are provided in Table 3.4-12, and the measurement sites are depicted on Figure 3.4-7 (sheets 1 through 3). In addition, vibration propagation measurements were conducted at 11 sites throughout the vibration RSA along the proposed project alignment, as described in the *Los Angeles to Anaheim Project Noise and Vibration Technical Report* (Authority 2025). The measurement results at these locations were used to characterize the ground vibration propagation conditions at particular VSAs.

Between U.S. Highway 101 and Redondo Junction, five NSAs and five VSAs were identified, consisting of a mixture of commercial, industrial, and multifamily residential areas. In addition to residences, sensitive receivers for this segment include Downtown Rehearsal (a recording studio space). For noise, measured L_{dn} values within this segment range from 59 to 67 dBA.

Between Redondo Junction to Fullerton Junction, 27 NSAs and 27 VSAs were identified, consisting of a mixture of commercial, industrial, and residential areas with single-family and multifamily homes. In addition to residences, sensitive receivers include Immediate Medical Center, Plaza de la Raza/Maizeland Elementary School, Los Nietos Middle School, Our Lady of Perpetual Help (a place of worship), John H. Glenn High School, Jesus' Hands Montessori Preschool, Praise Chapel of Buena Park, Hunt Branch Library, Pacific Drive Elementary School, One Spirit Church, Saint Mary's Catholic Church, the Vietnamese Muslim Community, the STAGES Theater, Vineyard Fullerton Church, the Maverick Theater, and Pure Water Church. For noise, measured L_{dn} values within this segment range from 54 to 82 dBA.

Between Fullerton Junction and Anaheim Regional Transportation Intermodal Center (ARTIC), 14 NSAs and 14 VSAs were identified, consisting of a mixture of commercial, industrial, and residential areas with single-family and multifamily homes. In addition to residences, sensitive receivers include Thomas Jefferson Elementary School, Tru One Records (a recording studio space), Saddleback Church in Anaheim (a place of worship), and the Iglesia Adventista Del 7moDia Hispana Emmanuel (a place of worship). For noise, measured L_{dn} values within this segment range from 61 to 71 dBA.

Table 3.4-12 Summary of Existing Noise Measurements in the Project Section

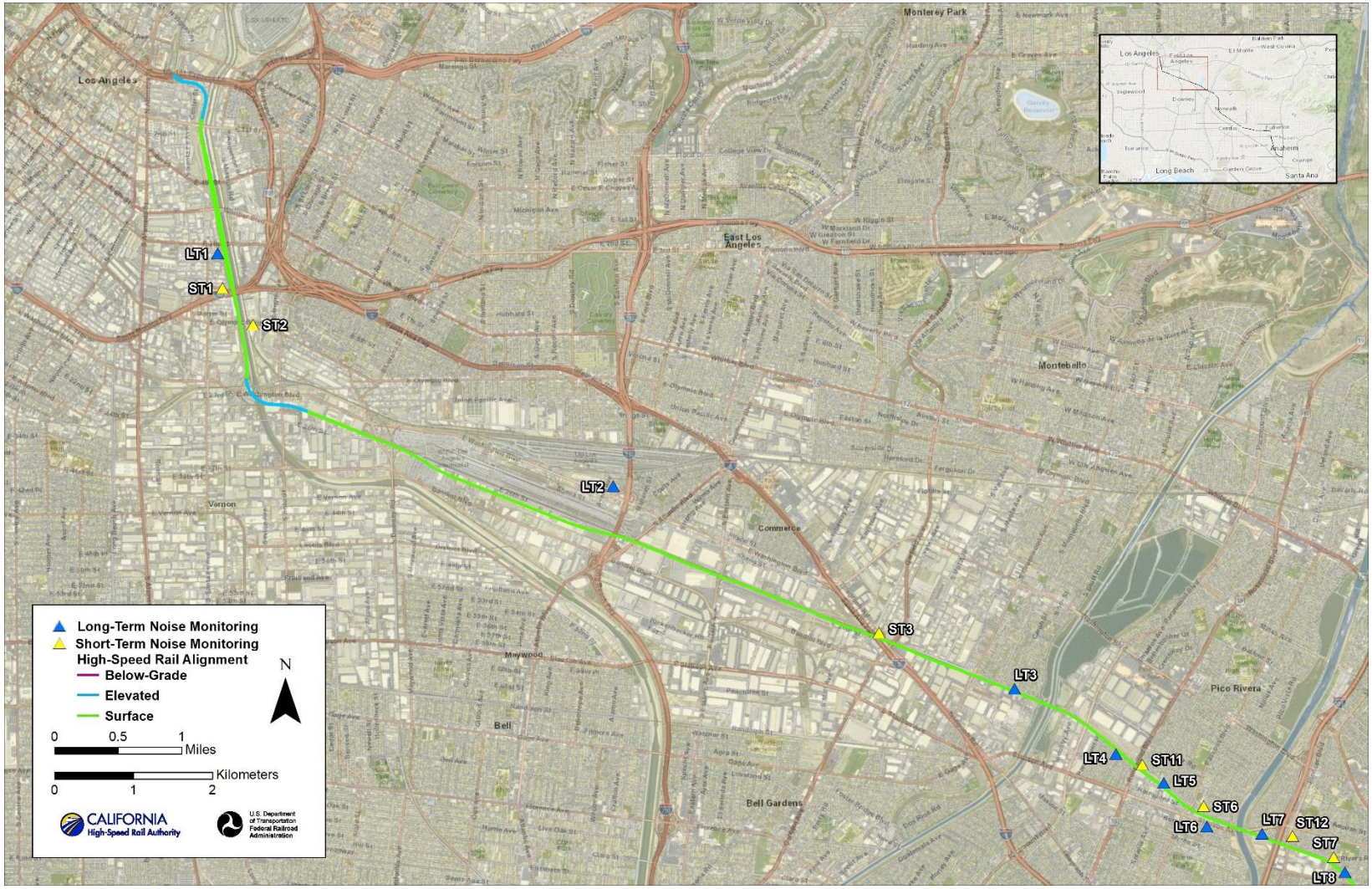
Site No.	Measurement Location	City	Measurement Start		Meas. Duration (hr)	Noise Level (dBA)	
			Date	Time		L_{eq}	L_{dn}
LT-1	2140 E 7th Pl	Los Angeles	8/3/2016	11:00 a.m.	24	62	67
LT-2	2308 Bedessen Ave	Commerce	8/4/2016	11:00 a.m.	24	60	67
ST-1	2444 E 8th St	Los Angeles	8/4/2016	3:09 p.m.	1	61	59[1]
ST-2	2556 E Olympic Blvd	Los Angeles	8/4/2016	4:22 p.m.	1	66	64[1]
LT-3	1498 Carob Wy	Montebello	8/2/2016	4:00 p.m.	24	64	74
LT-4	8743 Warvale St	Pico Rivera	8/1/2016	1:00 p.m.	24	61	67
LT-5	7560 Serapis Ave	Pico Rivera	8/1/2016	1:00 p.m.	24	67	75
LT-6	7805 Hasty Ave	Pico Rivera	8/1/2016	1:00 p.m.	24	62	67
LT-7	10481 Cascade Cir	Whittier	8/1/2016	12:00 p.m.	24	77	82
LT-8	11437 Burke St	Whittier	8/1/2016	12:00 p.m.	24	70	77
LT-9	12657 Civic Center Dr	Norwalk	8/8/2016	4:00 p.m.	24	57	63
LT-10	Hayden Ave	Norwalk	7/28/2016	12:00 p.m.	24	61	68
LT-11	14354 San Ardo Dr	La Mirada	7/27/2016	12:00 p.m.	24	60	68
LT-12	Stage Rd	La Mirada	7/27/2016	12:00 p.m.	24	73	76
LT-13	7756 Granada Dr	Buena Park	7/27/2016	11:00 a.m.	24	64	70
LT-14	7632 Tulare St	Buena Park	7/27/2016	11:00 a.m.	24	61	68
LT-15	5751 Stanton Ave	Buena Park	7/27/2016	11:00 a.m.	24	57	64
LT-16	5622 Cajon Ave	Buena Park	8/8/2016	2:00 p.m.	24	68	72
LT-17	139 N Pritchard Ave	Fullerton	7/25/2016	3:00 p.m.	24	64	71
LT-18	1812 Gregory Ave	Fullerton	7/25/2016	2:00 p.m.	24	63	67
LT-19	207 S Basque Ave	Fullerton	7/25/2016	1:00 p.m.	24	60	68

Site No.	Measurement Location	City	Measurement Start		Meas. Duration (hr)	Noise Level (dBA)	
			Date	Time		L_{eq}	L_{dn}
LT-20	201 Chestnut Pl	Fullerton	8/3/2016	11:00 a.m.	24	66	74
LT-21	311 S Highland Ave	Fullerton	7/25/2016	12:00 p.m.	24	54	60
LT-22	303 Metro Ct	Fullerton	7/25/2016	12:00 p.m.	24	68	75
ST-3	6630 Telegraph Rd	Commerce	8/9/2016	3:00 p.m.	1	73	71[1]
ST-4	Praise Chapel Orange County	Fullerton	7/28/2016	4:50 p.m.	1	70	68[1]
ST-5	Kingdom Hall	Fullerton	7/28/2016	3:43 p.m.	1	68	66[1]
ST-6	7601 Cord Ave	Pico Rivera	8/9/2016	4:30 p.m.	1	60	58[1]
ST-7	8600 S Alburtis Ave	Whittier	8/8/2016	5:00 p.m.	1	61	59[1]
ST-8	13031 Shoemaker Ave	Norwalk	8/8/2016	3:40 p.m.	1	58	56[1]
ST-9	100 S Richman Ave	Fullerton	8/3/2016	4:16 p.m.	1	57	55[1]
ST-11	9016 Rivera Rd	Pico Rivera	8/1/2016	1:40 p.m.	1	56	54[1]
ST-12	10701 Wheelock Cir	Whittier	8/1/2016	2:56 p.m.	1	64	62[1]
ST-13	1830 Commonwealth Ave	Fullerton	7/25/2016	4:30 p.m.	1	70	68[1]
ST-15	140 S Citrus Ave	Fullerton	7/25/2016	2:34 p.m.	1	58	56[1]
LT-24	145 S Princeton Ave	Fullerton	7/20/2016	5:00 p.m.	24	61	68
LT-25	801 E Balsam Ave	Anaheim	7/20/2016	4:00 p.m.	24	65	69
LT-26	759 N Mavis St	Anaheim	7/19/2016	4:00 p.m.	24	65	67
LT-27	712 N Pauline St	Anaheim	7/19/2016	4:00 p.m.	24	58	61
LT-28	198 N Vintage Ln	Anaheim	7/19/2016	3:00 p.m.	24	57	61
LT-29	385 S Vine St	Anaheim	7/19/2016	1:00 p.m.	24	58	61
LT-30	696 E Water St	Anaheim	7/19/2016	12:00 p.m.	24	59	62
LT-31	Marriot TownePlace Suites	Anaheim	7/19/2016	11:00 a.m.	24	68	71
ST-10	1300 S Lewis St	Anaheim	8/10/2016	7:53 a.m.	1	67	65[1]
ST-14	828 N Pauline St	Anaheim	7/19/2016	3:54 p.m.	1	65	63[1]

Source: Authority 2025

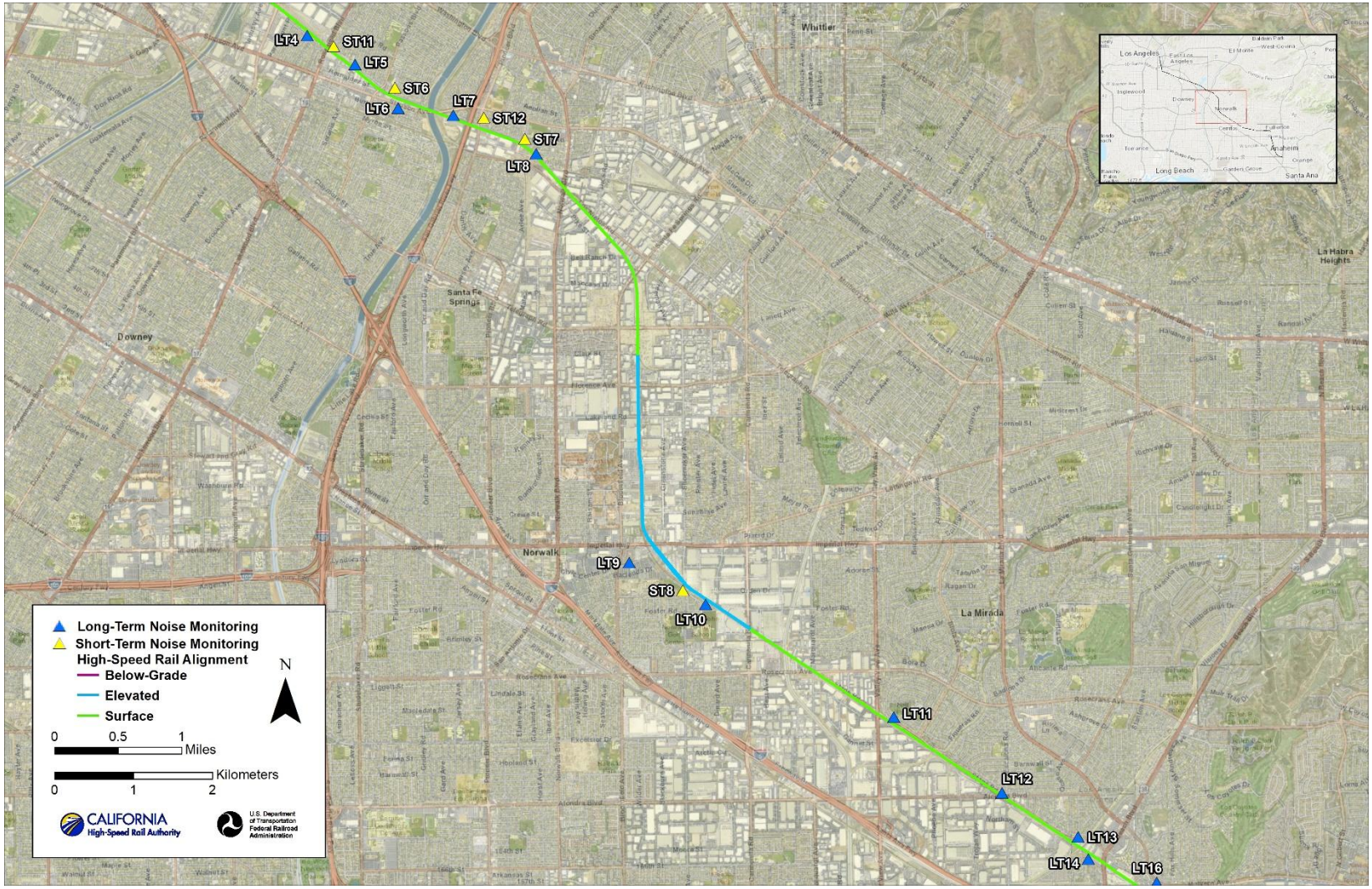
[1] Estimated based on measured 1-hour L_{eq} using Option 4 in Appendix B of the Federal Railroad Administration guidance document (FRA 2012)

dBA = A-weighted decibels; hr = hours; L_{dn} = day-night sound level; L_{eq} = equivalent sound level; LT = sites with long-term (24-hour) measurement duration; ST = sites with short-term (1-hour) measurement duration



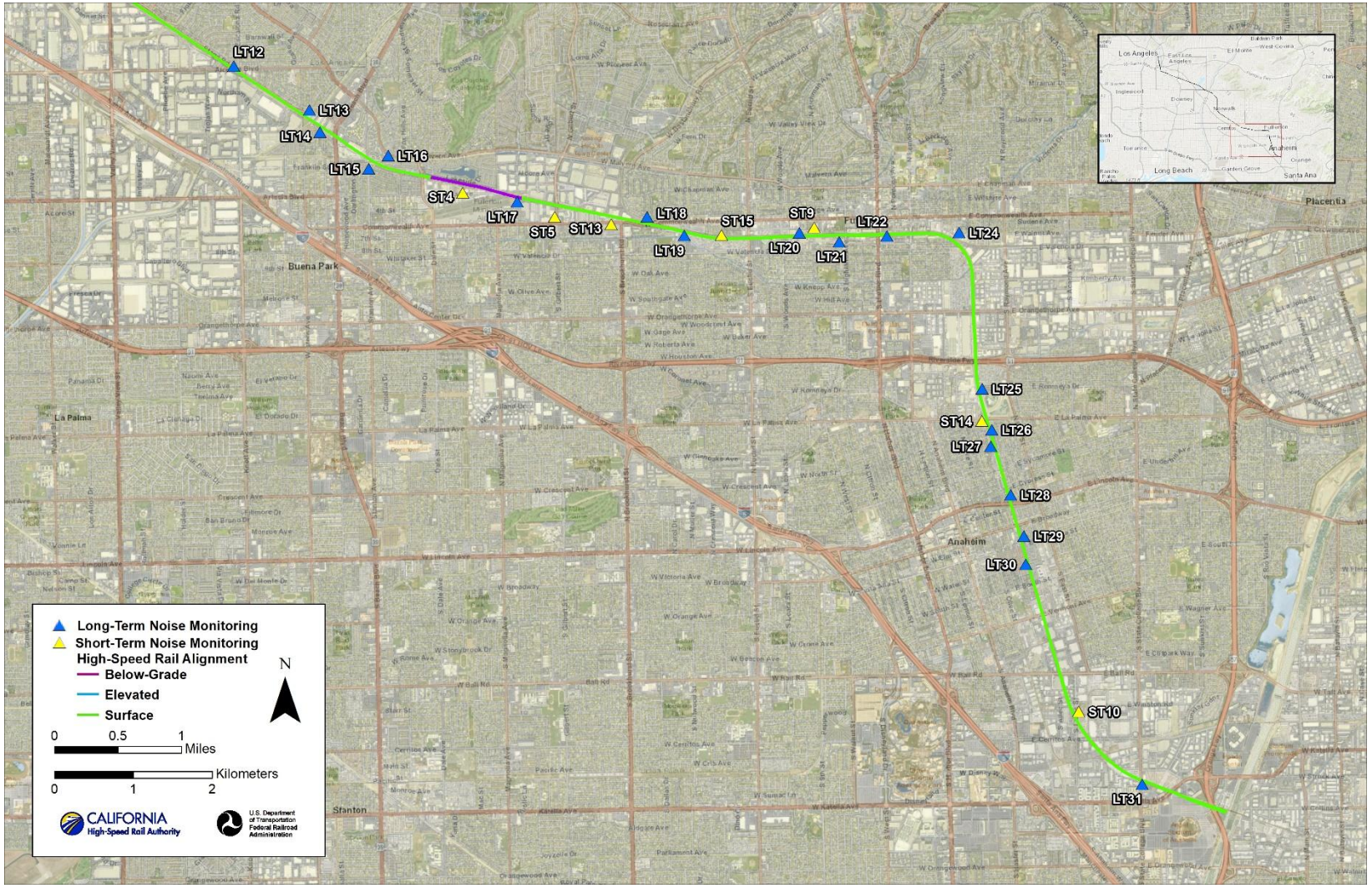
Source: ESRI 2024
Preliminary draft; alignment subject to change.

Figure 3.4-7 Existing Noise Measurement Locations in the Project Section, Sheet 1 of 3



Source: ESRI 2024
Preliminary draft; alignment subject to change.

Figure 3.4-7 Existing Noise Measurement Locations in the Project Section, Sheet 2 of 3



Source: ESRI 2024
Preliminary draft; alignment subject to change.

Figure 3.4-7 Existing Noise Measurement Locations in the Project Section, Sheet 3 of 3

3.4.6 Environmental Consequences

3.4.6.1 Overview

This section discusses the potential impacts on noise and vibration from project construction and operations on sensitive receptors and structures for the project alternatives and station options. Each resource category addresses potential impacts from the No Project Alternative and the Shared Passenger Track Alternatives. For this resource topic, any differences in the impacts for the HSR station options are described in the analysis.

The analysis evaluates construction noise and vibration, and noise and vibration associated with train operations, passenger stations, light maintenance facilities (LMF)s, and traction power facilities under the No Project, 2040 No Project, and 2040 Plus Project conditions. It also evaluates the potential for human annoyance from the rapid onset of noise from HSR pass-bys, indirect noise impacts associated with changes in vehicular traffic as a result of project operations, and the potential for noise impacts on livestock near the right-of-way.

The evaluation of vibration impacts focuses on the temporary exposure of sensitive receptors and buildings to construction-related vibration, temporary and permanent exposure of buildings to construction-related vibration damage, and permanent exposure of sensitive receptors to vibration associated with project operations.

The Authority will incorporate an IAMF (**NV-IAMF#1**) into the project to minimize construction-related noise and vibration impacts. The IAMF requires the contractor to prepare and submit to the Authority prior to construction a noise and vibration technical memorandum documenting how the FTA and FRA guidelines for minimizing construction noise and vibration impacts will be employed when work is conducted within 1,000 feet of sensitive receptors. This IAMF is described in detail in Appendix 2-A.

The IAMFs differ from mitigation measures in that they are part of the project regardless of whether an impact is identified in this document. In contrast, mitigation measures may be available to further reduce, compensate for, or offset project impacts that the analysis identifies under NEPA or concludes are significant under CEQA.

The impacts of the Shared Passenger Track Alternatives are described and organized as follows.

Construction Impacts

- Impact N&V-1: Temporary Exposure of Sensitive Receivers to Construction Noise
- Impact N&V-2: Temporary Exposure of Sensitive Receivers to Vibration from Construction
- Impact N&V-3: Temporary Traffic-Generated Noise from Rerouting Traffic During Construction

Operational Impacts

- Impact N&V-4: Permanent Exposure of Sensitive Receivers to Noise from Project Operation
- Impact N&V-5: Permanent Exposure of Sensitive Receivers and Buildings to Vibrations from Project Operation
- Impact N&V-6: Effects on Wildlife and Domestic Animals
- Impact N&V-7: Traffic Noise
- Impact N&V-8: Noise from High-Speed Rail Stationary Facilities

3.4.6.2 No Project Alternative

Under the No Project Alternative, the Shared Passenger Track Alternatives would not be built, and there would be no temporary or permanent increases in project-related noise or vibration. However, the population in the RSAs would continue to grow, specifically in Orange County, and changes in noise and vibration sources from development projects and infrastructure

improvements along with additional rail and road traffic from other planned projects within the existing rail alignment could cause localized noise and vibration impacts.

Within the project section, noise and vibration effects would occur from other planned and committed projects to be built by 2040. Growth in the RSAs for the project would add additional residential and commercial developments and associated infrastructure that could affect traffic noise levels in the RSAs. The No Project Alternative would include the future development reported in the general plans of the cities and counties within the project section, including both suburban expansion and development in existing urban areas. This future development would include additional rail traffic from other planned projects within the existing rail alignment that may result in a perceptible increase in noise levels at adjacent receivers. Future planned and committed projects that may influence the future noise and vibration environment within the RSAs for the project are described in Section 3.19.

Planned development and transportation projects that would occur as part of the No Project Alternative would likely include project design features and mitigation to reduce impacts related to noise and vibration. Future roadway projects under the No Project Alternative would require individual environmental review, including an analysis of traffic noise and vibration impacts on sensitive receivers that would be analyzed under state and federal highway noise criteria. Increases in noise and vibration from development projects would be regulated by local general plans and noise and vibration ordinances. It would be the responsibility of the affected jurisdiction to ensure that consistency with local regulations and ordinances aimed at avoiding or reducing permanent increases in noise and vibration levels is achieved.

The No Project Alternative is the scenario where the project is not implemented. If the project is not built, then temporary construction impacts and permanent changes from operations associated with this project would be avoided. Under the No Project Alternative, construction and operational impacts on sensitive receivers from HSR noise and vibration would not occur in the RSAs for the project.

However, similar impacts, including noise and vibration impacts on sensitive receivers and land uses, could persist through recent development trends. Planned development and transportation projects that would occur under the No Project Alternative would likely include mitigation to address noise and vibration impacts. These development activities include demolition, new construction, ground disturbance, and compaction in construction and staging areas, and could lead to impacts on noise and vibration.

The reasonably foreseeable development under the No Project Alternative would be evaluated as part of the process associated with each future project to determine the significance of impacts and mitigation measures, as needed, to avoid or reduce significant impacts. It would be the affected jurisdictions' responsibility to ensure compliance with established regulations. The other transportation and development projects and planned projects under the No Project Alternative would undergo environmental review, and effects from noise and vibration would be analyzed and mitigated.

3.4.6.3 Project Impacts

Construction and operations of the Shared Passenger Track Alternatives could result in temporary and permanent impacts related to noise and vibration. Construction of the Shared Passenger Track Alternatives would involve demolition of existing structures, clearing and grubbing; reduction of permeable surface area; handling, storing, hauling, excavating, and placing fill; possible pile driving; and construction of aerial structures, bridges, road modifications, utility upgrades and relocations, installation of power poles, HSR electrical systems, and railbeds. Operation of the Shared Passenger Track Alternatives would include the operation of trains and inspection and maintenance along the track and at LMFs and railroad right-of-way, as well as on the structures, fencing, power system, train control, electric interconnection facilities, and communications. Construction and operations and maintenance are more fully described in Chapter 2, Alternatives.

The following sections separately describe each construction and operational impact for the project section.

Construction Impacts

Impact N&V-1: Temporary Exposure of Sensitive Receivers to Construction Noise

Shared Passenger Track Alternative A

Construction of the project would involve demolition of existing structures; clearing and grubbing; reduction of permeable surface area; handling, storing, hauling, excavating, and placing fill; possible pile driving; construction of aerial structures and bridges; road modifications; utility upgrades and relocations; and installation of power poles, HSR electrical systems, and railbeds. Construction of the project would require the use of mechanical equipment, including hand-held pneumatic tools, scrapers, bulldozers, dump trucks, and tie and rail handling equipment that could generate temporary increases in noise for various durations at any given location, depending on the construction activity. A complete list of the construction equipment that may be used for each phase and sub-phase of construction is provided in Appendix I, High-Speed Rail Corridor Construction Equipment List by Construction Phase, of the *Los Angeles to Anaheim Project Section Noise and Vibration Technical Report* (Authority 2025). Construction would mostly occur 5 days a week between the hours of 7:00 a.m. and 7:00 p.m. However, some construction activities may be conducted at night to limit effects on peak highway traffic.

Analysts identified eight typical types of construction activities that would be used during project construction and evaluated a worst-case scenario where all pieces of construction equipment for each activity operate concurrently at a given construction site over an 8-hour day. Analysts calculated the total 8-hour L_{eq} and the distance within which the L_{eq} would exceed the daytime and nighttime noise impact criteria provided in Table 3.4-5. Table 3.4-13 presents the results of this analysis in terms of the estimated noise impact distances for daytime and nighttime work for each phase and sub-phase of construction. The results indicate the distances within which FRA construction noise criteria would be exceeded during daytime hours (between 7:00 a.m. and 10:00 p.m.) and nighttime hours (10:00 p.m. to 7:00 a.m.). Noise-sensitive receivers at distances of up to 645 feet from a construction zone may be exposed to noise levels exceeding the FRA criteria for daytime hours. Noise-sensitive receivers at distances of up to 2,038 feet from a construction zone may be exposed to noise levels exceeding the FRA criteria for nighttime hours

Construction noise impact was evaluated based on construction scenarios for each of the 23 distinct construction phases included in Table 3.4-13. The construction noise impact analysis is based on the unique set of construction equipment that would be used in each phase of construction. Construction phases generally run sequentially, with one phase completing use of the most noise-intensive equipment before equipment for another phase is mobilized. Therefore, it is not anticipated that activities associated with multiple phases would occur simultaneously such that the noise effects would combine.

Temporary noise impacts are expected to occur at noise-sensitive receivers within the distances from the construction activity where construction noise criteria may be exceeded for one or more phases of construction presented in Table 3.4-13. Construction noise would result in an impact for noise-sensitive receivers within the estimated impact distances presented in Table 3.4-13 in the cities of Los Angeles, Vernon, Bell, Commerce, Montebello, Pico Rivera, Whittier, Norwalk, Santa Fe Springs, La Mirada, Buena Park, Fullerton, and Anaheim.

The method used to estimate the total number of sensitive receiver locations potentially affected during construction along the project section uses a weighted average of the calculated noise impact distances for all 23 construction scenarios in Table 3.4-13. Each impact distance is weighted based on the length of the corridor along which sensitive receivers would be exposed to noise from each construction activity. For example, at-grade rail construction would affect sensitive receivers along 23.8 miles of the corridor, whereas construction occurring at fixed locations (e.g., at grade separations or stations) would affect sensitive receivers along shorter segments of the corridor. Segment lengths are twice the impact distance for each activity at each fixed location. This conservative calculation method yields weighted average impact distances of

about 150 feet for daytime construction and about 600 feet for nighttime construction. Based on a geographic information system inventory of noise-sensitive receivers within these distances, it is estimated that noise impacts could temporarily occur at a total of 1,379 FRA Category 2 (residential) receivers and at four FRA Category 3 (institutional) receivers (including a theater, a library, and two churches) during daytime construction. During nighttime construction, it is estimated that noise impacts could temporarily occur at a total of 7,855 residences; nighttime impacts are only applicable to Category 2 receivers.

Some of the project elements described in Table 3.4-13 could occur as early action projects. An early action project is a regionally significant connectivity project that provides early benefits to transit riders and local communities and lays a solid foundation for the HSR system. Early action projects include grade separations and improvements at regional passenger rail stations. For a full list and detailed description of each early action project, refer to Chapter 2.

For improvements related to the proposed traction power substation (TPSS) and associated electrical interconnections bringing in power to the project site from utility providers, a noise impact could occur if noise-sensitive receivers are within 288 feet of daytime construction activity and within 910 feet of nighttime construction activity (refer to Table 3.4-13). The TPSS, located along Washington Boulevard in Los Angeles, would be situated in a dense industrial area. Along E Washington Boulevard from Soto Street to 1,000 feet east of Downey Road, the project would replace existing power lines with steel tubular poles along the west side of Washington Boulevard within existing roadways and public utility facilities. Approximately 35 poles would be required to connect the TPSS to the power source on De La Torre Way and 15th Street. Erection and pole foundation would require temporary lane closures, and construction work would last 6 to 8 months. The utility improvements to connect electricity to HSR would not result in a noise impact because there are no noise-sensitive receivers within 910 feet of construction activity.

The proposed TPSS site near the intersection of Lewis Street and Cerritos Avenue is in an area composed of office complexes and mixed commercial/light manufacturing facilities. It is assumed that this substation would be the source of power for the HSR TPSS approximately 0.2 mile northeast of the substation. Because the general area has underground power distribution, it is assumed that the two 115-kilovolt circuits would be routed to the TPSS site underground. In Anaheim, it is anticipated that work would be done during construction of the Cerritos grade separation, and conduit installation would take up to 3 months. Considered independently, the utility improvements to connect electricity to HSR would not result in a noise impact because there are no noise-sensitive receivers within 910 feet of the TPSS construction activity. Although the maximum noise impact distance for nighttime construction could extend to approximately 1,400 feet if TPSS construction were to occur simultaneously with construction of the Cerritos grade separation, this condition would still not result in a noise impact because there are no noise-sensitive receivers within this distance in this industrial and commercial area.

For grade separations that require a heavy level of construction activity (refer to Table 3.4-13), a noise impact could occur if noise-sensitive receivers are within 355 feet of daytime construction activity and within 1,123 feet of nighttime construction activity. The following early action grade-separation projects would require a heavy level of construction activity: Pioneer Boulevard Grade Separation, Norwalk Boulevard Grade Separation, Los Nietos Road Grade Separation, Cerritos Avenue Grade Separation, and State College Boulevard Grade Separation. However, only the Pioneer Boulevard, Norwalk Boulevard, and State College Boulevard Grade Separations could result in impacts because of the presence of noise-sensitive receivers within 1,123 feet of construction activity for these grade separations. It is estimated that noise impacts could temporarily occur at a total of 138 Category 2 (residential) receivers in the vicinity of these three grade-separation projects during daytime construction. During nighttime construction, it is estimated that noise impacts could temporarily occur at 1,241 residences. Approximately 90 percent of the impacts are expected to occur at residences near the Pioneer Boulevard grade separation, and no impacts are anticipated at any institutional receivers.

For the construction of stations, a noise impact could occur if noise-sensitive receivers are within a distance of up to 321 feet from daytime construction activity or 1,014 feet from nighttime

construction activity. The following passenger rail stations would be modified or relocated: Commerce Metrolink Station, Norwalk/Santa Fe Springs Metrolink Station, Buena Park Metrolink Station, and Fullerton Metrolink/Amtrak Station. Construction of the relocated Buena Park Metrolink Station could result in a noise impact because noise-sensitive receivers would be within 280 feet of daytime construction activity and within 887 feet of nighttime construction activity. Construction of the relocated Commerce Metrolink Station would not result in a noise impact because no noise-sensitive receivers would be within 280 feet of daytime construction activity or within 887 feet of nighttime construction activity. Construction of the Norwalk/Santa Fe Springs Metrolink Station modifications would not result in a noise impact during daytime construction activity because no noise-sensitive receivers would be within 295 feet but could result in a noise impact during nighttime construction because noise-sensitive receivers would be within 934 feet. Construction of the Fullerton Metrolink/Amtrak Station modifications could result in a noise impact because noise-sensitive receivers would be within 321 feet of daytime construction activity and within 1,014 feet of nighttime construction activity. Construction of the HSR station platform and facilities at ARTIC would not result in a noise impact during daytime construction activity because no noise-sensitive receivers would be within 313 feet but could result in noise impact at a hotel within 990 feet during nighttime construction activity.

The design characteristics include measures to comply with FRA guidelines and minimize noise impacts. **NV-IAMF#1** requires the contractor to document how federal guidelines for minimizing noise and vibration would be employed when construction is occurring near sensitive receivers (such as hospitals, residential neighborhoods, and schools). In addition, the Authority would implement mitigation measures to minimize the impacts on sensitive receivers from construction noise. **N&V-MM#1, Construction Noise Mitigation Measures**, requires the contractor to provide noise control measures as necessary to meet the noise limits and to monitor construction noise to verify compliance with the limits.

Table 3.4-13 Estimated Noise Impact Distances Based on Federal Railroad Administration Criteria for Construction Activities in Residential Areas Along the Project Section

Construction Activity	Construction 8-hour L_{eq} at 50 feet (dBA)[1]	Daytime 80 dBA L_{eq}[2] (feet)[3]	Nighttime 70 dBA L_{eq}[2] (feet)[4]
At-Grade Rail Construction (1st Street in City of Los Angeles to ARTIC)			
Utility relocation	87	106	334
New track ballast installation	83	69	218
Direct Fixation Rail Installation for Aerial and Tunnel Structures			
Plinth construction	95	275	871
Trench Construction (Fullerton)			
Utility relocation	87	116	368
Tunnel construction	96	312	988
Elevated Structure Construction (Commerce)			
Utility relocation	88	119	376
Foundation and column construction	95	297	940
Precast concrete box girder placement	93	235	742
Elevated Structure Construction (Santa Fe Springs/Norwalk)			
Utility relocation	88	119	376
Foundation and column construction	95	297	940

Construction Activity	Construction 8-hour L_{eq} at 50 feet (dBA)[1]	Daytime 80 dBA L_{eq}[2] (feet)[3]	Nighttime 70 dBA L_{eq}[2] (feet)[4]
Precast concrete box girder placement	93	235	742
Grade Separation Roadway Improvements			
Level 1: minor work required	89	136	430
Level 2: light work required	94	253	799
Level 3: medium work required	96	308	973
Level 4: heavy work required	97	355	1,123
Water Crossings			
Level 1: minor work required	87	117	369
Level 2: light work required	102	637	2,013
Level 3: medium work required	102	645	2,038
System Sites			
TPSS, TPPS, TSS, and communication towers	95	288	910
Station Construction			
Commerce and Buena Park Metrolink Station relocations	95	280	887
Norwalk/Santa Fe Springs Metrolink Station modification	95	295	934
Fullerton Metrolink/Amtrak Station modification	96	321	1,014
ARTIC Station	96	313	990

Source: Authority 2025

[1] These values represent combined L_{eq} noise exposures that include all equipment expected to be used during each construction activity and assume a worst-case scenario of all the construction equipment operating at a given location over an 8-hour day. The equipment types assumed in the noise calculation for each construction activity are included in Appendix I of the *Los Angeles to Anaheim Project Section Noise and Vibration Technical Report*.

[2] Federal Railroad Administration construction noise criteria are provided in Table 3.4-5.

[3] This column presents the distance at which a noise impact would occur for residential receptors between the hours of 7 a.m. and 10 p.m.

[4] This column presents the distance at which a noise impact would occur for residential receptors between the hours of 10 p.m. and 7 a.m.

ARTIC = Anaheim Regional Transportation Intermodal Center; dBA = A-weighted decibels; L_{eq} = equivalent sound level; TPPS = traction power paralleling station; TPSS = traction power substation; TSS = traction power switching station

Shared Passenger Track Alternative B

Because there are no noise-sensitive receivers near the LMF at 15th Street, temporary exposure of sensitive receptors to noise impacts during construction would be the same as that described for Shared Passenger Track Alternative A. The design characteristics of the project include measures to reduce construction-related noise. **NV-IAMF#1** requires the contractor to document how federal guidelines for minimizing noise and vibration would be employed when construction is occurring near sensitive receivers (such as hospitals, residential neighborhoods, and schools). In addition, the Authority would implement mitigation measures to minimize the impacts on sensitive receivers from construction noise. **N&V-MM#1** requires the contractor to provide noise control measures as necessary to meet the noise limits and to monitor construction noise to verify compliance with the limits.

High-Speed Rail Station Options

High-Speed Rail Station Option: Norwalk/Santa Fe Springs

With inclusion of the Norwalk/Santa Fe Springs HSR Station Option, temporary exposure to noise impacts during construction would be the same as those for the Shared Passenger Track Alternatives within the station area. The types of construction methods would be the same for the HSR platform, facilities, and parking, and impacts would be limited to sensitive receptors within 295 feet of the station site for daytime construction activity and within 934 feet for nighttime construction activity, which is the same as for the area that would be modified under the Shared Passenger Track Alternatives. **NV-IAMF#1** requires the contractor to document how federal guidelines for minimizing noise and vibration would be employed when construction is occurring near sensitive receivers (such as hospitals, residential neighborhoods, and schools). In addition, the Authority would implement mitigation measures to minimize the impacts on sensitive receivers from construction noise. **N&V-MM#1** requires the contractor to provide noise control measures as necessary to meet the noise limits and to monitor construction noise to verify compliance with the limits.

High-Speed Rail Station Option: Fullerton

With inclusion of the Fullerton HSR Station Option, temporary exposure to noise impacts during construction would be similar to those for the Shared Passenger Track Alternatives in the vicinity of the station. The types of construction methods would be the same for the HSR platform, facilities, and parking, and impacts would be limited to sensitive receptors within 321 feet of the station site for daytime construction activity and could extend to approximately 1,014 feet for nighttime construction activity.[2] However, because the construction area for this HSR station option would be greater than the area that would be modified under the Shared Passenger Track Alternatives, additional sensitive receivers could be affected by construction noise. **NV-IAMF#1** requires the contractor to document how federal guidelines for minimizing noise and vibration would be employed when construction is occurring near sensitive receivers (such as hospitals, residential neighborhoods, and schools). In addition, the Authority would implement mitigation measures to minimize the impacts on sensitive receivers from construction noise. **N&V-MM#1** requires the contractor to provide noise control measures as necessary to meet the noise limits and to monitor construction noise to verify compliance with the limits.

CEQA Conclusion

The impact under CEQA related to temporary exposure of sensitive receptors to noise generated during project construction would be potentially significant before mitigation. There are sensitive receivers within the estimated impact distances presented in Table 3.4-13. **NV-IAMF#1**, which is part of the project design, requires the contractor to provide the Authority with a technical memorandum documenting how federal guidelines for minimizing noise and vibration would be employed. In any given location along the HSR alignment, construction noise would be temporary and intermittent, and would cease once work is complete. Although **NV-IAMF#1** would reduce construction noise, the construction-related noise impacts would be significant under CEQA because noise-sensitive receivers within the estimated impact distances would be exposed to construction noise that exceeds the recommended FRA construction noise criteria of 80 dBA L_{eq} during daytime hours and 70 dBA L_{eq} during nighttime hours. Therefore, mitigation is required under CEQA. Impacts would be reduced by implementing **N&V-MM#1**, which requires the contractor to provide noise control measures as necessary to meet the noise limits and to monitor construction noise to verify compliance with the limits. After implementation of **N&V-MM#1**, the impact under CEQA related to temporary exposure of sensitive receptors to noise during construction would be less than significant with mitigation.

[2] The screening distances are different between the Norwalk/Santa Fe Springs and Fullerton HSR Station Options because each have different construction scenarios.

Impact N&V-2: Temporary Exposure of Sensitive Receivers to Vibration from Construction

Shared Passenger Track Alternative A

During construction, some activities may cause ground-borne vibration, most notably pile driving for structural foundations, vibro-compaction for ground improvements, drilling for bored pile viaduct foundations, and excavation for trenching. At 25 feet, construction equipment associated with these activities can produce vibration velocities of 0.644 inch per second (104 VdB) for pile driving, 0.210 inch per second (94 VdB) for vibro-compaction, and 0.089 inch per second (87 VdB) for drilling and excavation.

Table 3.4-14 provides the approximate distances within which receivers could experience construction-related vibration damage effects. Based on these distances, the construction activity with the greatest potential for vibration damage effects would be pile driving, which could affect structures at distances of up to 30 feet for the least sensitive buildings and at distances of up to 77 feet for the most sensitive buildings. Pile driving is anticipated to occur during construction at the San Gabriel River, Coyote Creek/North Fork, La Mirada Creek, and Brea Creek water crossings. However, the potential for vibration damage is limited to two commercial buildings near the Coyote Creek/North Fork water crossing and two residential buildings near the Brea Creek water crossing that are within 77 feet of these construction sites. These potential vibration impacts will need to be investigated in more detail during project design based on the actual locations of pile-driving activities and vibration sensitivities of the nearby buildings.

Table 3.4-14 Estimated Impact Distances for Construction Vibration Damage

Building Category[1]	Vibration Criterion (PPV, in/sec)	Approximate Vibration Impact Distance (feet)		
		Pile Driving	Vibro-Compaction	Drilling and Excavation
Category I	0.5	30	15	8
Category II	0.3	42	20	12
Category III	0.2	55	26	15
Category IV	0.12	77	37	21

Source: Authority 2025
[1] Refer to Table 3.4-8 for a description of the categories.
in/sec = inch per second; PPV = peak particle velocity

Construction activities would also have the potential to cause vibration annoyance or interference with the use of sensitive equipment. Table 3.4-15 provides the approximate distances within which receivers could experience construction-related vibration annoyance effects. The results presented in Table 3.4-15 indicate that human annoyance or interference by vibration from construction could be expected within a distance of up to 500 feet, depending on the category of land use and type of equipment used.

Construction of all project elements would result in vibration annoyance impacts for vibration-sensitive receivers within the estimated impact distances presented in Table 3.4-15 in the cities of Los Angeles, Vernon, Bell, Commerce, Montebello, Pico Rivera, Norwalk, Commerce, Montebello, Pico Rivera, Santa Fe Springs, La Mirada, Buena Park, Fullerton, and Anaheim, and Los Angeles and Orange Counties.

Construction at some water crossings would result in vibration annoyance impacts, where an exceedance of vibration thresholds would occur if vibration produced from pile driving occurs within 290 feet of a Category 2 (residential) receiver. The following water crossings could result in vibration impacts because construction would occur within 290 feet of such receivers:

- San Gabriel River water crossing (3 single-family residential buildings potentially affected)
- La Mirada Creek water crossing (16 multifamily residential units potentially affected)
- Brea Creek water crossing (28 single-family residential buildings potentially affected)

Construction vibration would result in a temporary impact because perceptible temporary increases in vibration levels are expected for sensitive receivers within the estimated vibration impact distances for one or more construction activity presented in Table 3.4-15. Impacts are expected to occur along the project section. The design characteristics of the project include measures to reduce construction-related vibration. **NV-IAMF#1** requires the contractor to document how federal guidelines for minimizing noise and vibration would be employed when construction is occurring near sensitive receivers (such as hospitals, residential neighborhoods, and schools). In addition, the Authority would implement **N&V-MM#2, Construction Vibration Mitigation Measures**, to minimize effects on sensitive receivers from construction-related vibration. **N&V-MM#2** requires preconstruction surveys to be conducted at locations within 80 feet of pile driving to document the existing condition of buildings in case damage is reported during or after construction. Damaged buildings would be restored or repaired to pre-impact condition or alternatively the property owner would be financially compensated for the damage (**N&V-MM#2**).

Table 3.4-15 Estimated Impact Distances for Construction Vibration Annoyance for the Project Section

Land Use Category[1]	Vibration Criterion Level (VdB)[2]	Approximate Vibration Impact Distance (feet)		
		Pile Driving	Vibro-Compaction	Drilling & Excavation
Category 1	65	500	230	135
Category 2	72	290	135	80
Category 3	75	230	105	65

Source: Authority 2025
[1] Table 3.4-9 provides a description of the categories.
[2] VdB = vibration decibel

Shared Passenger Track Alternative B

Because there are no vibration-sensitive receivers near the LMF at 15th Street, temporary exposure of sensitive receivers to vibration impacts during construction would be the same as that described for Shared Passenger Track Alternative A. Construction vibration would result in a temporary impact because perceptible temporary increases in vibration levels are expected for vibration-sensitive receivers within the estimated vibration impact distances for one or more construction activity presented in Table 3.4-15. Effects are expected to occur along the project section. The design characteristics of the project include measures to reduce construction-related vibration. **NV-IAMF#1** requires the contractor to document how federal guidelines for minimizing noise and vibration would be employed when construction is occurring near sensitive receivers (such as hospitals, residential neighborhoods, and schools). In addition, the Authority would implement **N&V-MM#2** to minimize effects on sensitive receivers from construction-related vibration. **N&V-MM#2** requires preconstruction surveys to be conducted at locations within 80 feet of pile driving to document the existing condition of buildings in case damage is reported during or after construction. Damaged buildings would be restored or repaired to pre-impact condition or alternatively the property owner would be financially compensated for the damage (**N&V-MM#2**).

High-Speed Rail Station Options

High-Speed Rail Station Option: Norwalk/Santa Fe Springs

With inclusion of the Norwalk/Santa Fe Springs HSR Station Option, temporary vibration impacts during construction would be the same as those of the Shared Passenger Track Alternatives within the station area. The types of construction methods would be the same for the HSR platform, facilities, and parking as they are for the area that would be modified under the Shared Passenger Track Alternatives. **NV-IAMF#1** requires the contractor to document how federal guidelines for minimizing noise and vibration would be employed when construction is occurring near sensitive receivers (such as hospitals, residential neighborhoods, and schools). In addition, the Authority would implement **N&V-MM#2** to minimize effects on sensitive receivers from construction-related vibration. **N&V-MM#2** requires preconstruction surveys to be conducted at

locations within 80 feet of pile driving to document the existing condition of buildings in case damage is reported during or after construction. Damaged buildings would be restored or repaired to pre-impact condition or alternatively the property owner would be financially compensated for the damage (**N&V-MM#2**).

High-Speed Rail Station Option: Fullerton

With inclusion of the Fullerton HSR Station Option, temporary vibration impacts during construction would be similar to those for the Shared Passenger Track Alternatives in the vicinity of the station. The types of construction methods would be the same for the HSR platform, facilities, and parking, as for the area that would be modified under the Shared Passenger Track Alternatives. However, because the construction area for this HSR station option would be greater than the area that would be modified under the Shared Passenger Track Alternatives, additional sensitive receivers could be affected by construction vibration. The design characteristics of the project include measures to reduce construction-related vibration. **NV-IAMF#1** requires the contractor to document how federal guidelines for minimizing noise and vibration would be employed when construction is occurring near sensitive receivers (such as hospitals, residential neighborhoods, and schools). In addition, the Authority would implement **N&V-MM#2** to minimize effects on sensitive receivers from construction-related vibration. **N&V-MM#2** requires preconstruction surveys to be conducted at locations within 80 feet of pile driving to document the existing condition of buildings in case damage is reported during or after construction. Damaged buildings would be restored or repaired to pre-impact condition or alternatively the property owner would be financially compensated for the damage (**N&VMM#2**).

CEQA Conclusion

The impact under CEQA related to temporary exposure of sensitive receptors to vibration during project construction would be potentially significant before mitigation. There are vibration-sensitive receivers within the estimated impact distances presented in Table 3.4-15. **NV-IAMF#1**, which is part of the project design, requires the contractor to provide the Authority with a technical memorandum documenting how federal guidelines for minimizing noise and vibration would be employed. In any given location along the HSR alignment, construction vibration would be temporary and intermittent, and would cease once work is complete. Although **NV-IAMF#1** would reduce construction vibration, some construction-related activities would generate excessive ground-borne vibration exceeding federal criteria for annoyance and building damage. This represents a significant impact under CEQA, and mitigation is required. Impacts would be reduced by implementing **N&V-MM#2**, which requires preconstruction surveys to be conducted at locations within 80 feet of pile driving to document the existing condition of buildings in case damage is reported during or after construction. After implementation of **N&V-MM#2**, the impact under CEQA related to temporary exposure of sensitive receptors to vibration during construction would be less than significant with mitigation.

Impact N&V-3: Temporary Traffic-Generated Noise from Rerouting Traffic During Construction

Shared Passenger Track Alternative A

This analysis addresses possible additional traffic noise as a result of traffic being rerouted because of local road closures during construction of the project. Construction of the project would result in temporary closure of portions of 19 local roads in the project section (identified in the *Los Angeles to Anaheim Project Section Noise and Vibration Technical Report* [Authority 2025]), which would require rerouting traffic and other roadway modifications. Rerouted traffic could affect existing noise levels in the noise RSA. Changes in traffic that expose sensitive receivers to noise levels exceeding FHWA and Caltrans NAC would be considered noise impacts.

Based on the projected increases in peak-hour traffic volumes on the anticipated detour routes during construction, it is estimated that traffic noise levels along these routes would increase by at most 4 to 5 dBA; the actual increases may be lower if the added traffic results in lower vehicle speeds along the routes. According to FHWA and Caltrans NAC, a substantial noise increase is considered to occur when the project's predicted worst-hour design-year noise level exceeds the

existing worst-hour noise level by 12 dBA or more. Because the estimated increases in traffic noise are only 0 to 5 dBA, there would be no significant noise impacts related to rerouted traffic.

Shared Passenger Track Alternative B

Temporary traffic-generated noise impacts from rerouting traffic during construction would be the same as those described for Shared Passenger Track Alternative A. Construction of the 15th Street LMF site would not require different road closures or detours than Shared Passenger Track Alternative A, and because the estimated increases in traffic noise are only 0 to 5 dBA, there would be no significant noise effects related to rerouted traffic.

High-Speed Rail Station Options

High-Speed Rail Station Option: Norwalk/Santa Fe Springs

With inclusion of the Norwalk/Santa Fe Springs HSR Station Option, impacts would be the same as those of the Shared Passenger Track Alternatives within the station area. All temporary closures and detours would be the same as those for the Shared Passenger Track Alternatives within the station area, and temporary traffic-generated noise impacts from rerouting traffic during construction would be the same.

High-Speed Rail Station Option: Fullerton

With inclusion of the Fullerton HSR Station Option, impacts would be the same as those of the Shared Passenger Track Alternatives within the station area. All temporary closures and detours would be the same as those for the Shared Passenger Track Alternatives within the station area, and temporary traffic-generated noise impacts from rerouting traffic during construction would be the same.

CEQA Conclusion

The impact under CEQA from traffic-generated noise during project construction would be less than significant. The increases in traffic noise from rerouting traffic are anticipated to be less than the 12 dBA L_{eq} threshold during peak noise hour conditions. Therefore, CEQA does not require mitigation.

Operational Impacts

Impact N&V-4: Permanent Exposure of Sensitive Receivers to Noise from Project Operation

Shared Passenger Track Alternative A

Noise levels from project operation would depend on the number of trains per day, speed of the trains, track configuration, and distance of receivers to the tracks. The assumptions used in the analysis are described in Section 3.4.4. In addition, as described in Section 4.3.2, Operating Conditions, of the *Los Angeles to Anaheim Project Section Noise and Vibration Technical Report* (Authority 2025), changes in noise from project-related relocation of freight tracks within the right-of-way were evaluated based on the changes in distance between the freight tracks and nearby sensitive receptors using FRA methodology. This evaluation indicated that no sensitive receivers would be substantially affected by changes in noise from freight track relocation.

The assessment of noise impacts from HSR operations is summarized in Table 3.4-16 for residential land uses and in Table 3.4-17 for institutional land uses. The results include a tabulation of location information for each sensitive receptor or receptor group, the projections of future noise levels, the impact criteria, and whether moderate or severe noise impacts are projected (only severe impacts are considered to be significant or adverse). The locations of noise impacts from HSR operations are depicted on Figure 3.4-8 (sheets 1 through 3). These impacts would be permanent.

The results of the assessment indicate that predicted operational noise levels would exceed severe impact criteria at 59 residences and moderate impact criteria at 443 residences. No impacts are predicted to occur at institutional land uses. Operational noise levels are predicted to exceed noise impact criteria at the following residential locations in the project section:

- **Rio Hondo Channel to Rosemead Boulevard (Pico Rivera):** In this area, moderate noise impacts are projected at 14 single-family residences and severe noise impacts are projected at 3 single-family residences, all on the southbound side of the tracks. These impacts would be caused by the proximity of the receivers to the proposed track and the speed of the train.
- **Brea Creek to Dale Street (Buena Park):** In this area, moderate noise impacts are projected at four residences in a multifamily building on the northbound side of the tracks. These impacts would be caused by the proximity of the receivers to the proposed track and the speed of the train.
- **Euclid Street to S Richman Avenue (Fullerton):** In this area, moderate noise impacts are projected at four single-family residences on the southbound side of the tracks. These impacts would be caused by the proximity of the receivers to the proposed track and the speed of the train.
- **E La Palma Avenue to E Wilhelmina Street (Anaheim):** In this area, moderate noise impacts are projected at 82 residences in 13 multifamily buildings on the northbound side of the tracks. The impacts would result from the proximity of the receivers to the proposed track and the speeds of the train.
- **E Wilhelmina Street to E Sycamore Street (Anaheim):** In this area, moderate noise impacts are projected at three single-family residences and severe noise impacts are projected at two single-family residences, all on the northbound side of the tracks. The impacts would result from the proximity of the receivers to the proposed track and the speeds of the train.
- **E Sycamore Street to Lincoln Avenue (Anaheim):** In this area, moderate noise impacts are projected at 14 single-family residences on the southbound side of the tracks and severe noise impacts are projected at 36 residences in 12 multifamily buildings on the northbound side of the tracks. The impacts would result from the proximity of the receivers to the proposed track and the speeds of the train.
- **Lincoln Avenue to E Santa Ana Street (Anaheim):** In this area, moderate noise impacts are projected at 39 residences and severe noise impacts are projected at 18 residences. The 18 severe impacts are projected at three multifamily buildings and the 39 moderate impacts are projected at a combination of 11 single-family residences and four multifamily buildings on the northbound side of the tracks. The impacts would result from the proximity of the receivers to the proposed track and the speeds of the train.
- **E Santa Ana Street to Vermont Avenue (Anaheim):** In this area, moderate noise impacts are projected at 57 multifamily residences in 23 buildings on the northbound side of the tracks and at 226 multifamily residences in 14 buildings on the southbound side of the tracks. These impacts would result from the proximity of the receivers to the proposed track and the speeds of the train.

To reduce effects on sensitive receivers from operational noise, the Authority would implement **N&V-MM#3, Implement California High-Speed Rail Project Noise Mitigation Guidelines**, as described below in more detail. It should be noted that, based on CEQA significance criteria only, severe noise impacts are considered to be significant or adverse and require mitigation.

Based on a preliminary evaluation, application of **N&V-MM#3** will require the installation of an impervious sound barrier at one location, extending from 150 feet south of E Cyprus Street to near E Sycamore Street, with a setback of approximately 12 feet (or less if feasible) from the proposed northbound track centerline and with a height of 8 feet above the top-of-rail elevation. The sound barrier would be approximately 875 feet long and would provide effective noise mitigation for 33 of the 59 affected residences. Because a sound barrier would not meet the mitigation guidelines for the remaining 26 residences with severe noise impacts, these residences would have residual severe noise impacts. For these locations, other measures included in **N&V-MM#3** would be implemented, including noise abatement at receiver locations (for example, sound insulation of buildings) and easement acquisition.

Table 3.4-16 Residential Noise Impact Assessment for the Project Section

Location/City	Side of Track	Closest Receiver(s) Distance to Near Track (feet)	Maximum Train Speed (mph)	Existing Noise Level (dBA)	Project Noise Level (dBA)	Noise Impact Criteria (dBA)		Number of Affected Receivers	
						Mod.	Sev.	Mod.	Sev.
E 1st St to Whittier Blvd, Los Angeles	SB	388	50	67	48	62	68	0	0
Whittier Blvd to Redondo Jct, Los Angeles	SB	227	50	67	49	62	68	0	0
I-5 to Greenwood Ave, Commerce/Montebello	NB	570	90	74	41	65	72	0	0
Greenwood Ave to Rio Hondo, Montebello	NB	121	90	74	58	65	72	0	0
Rio Hondo to Rosemead Blvd, Pico Rivera	SB	26	79	67	69	62	67	14	3
Rosemead Blvd to Passons Blvd, Pico Rivera	NB	113	79	75	58	65	73	0	0
Rosemead Blvd to Passons Blvd, Pico Rivera	SB	308	79	67	46	62	67	0	0
Passons Blvd to I-605, Pico Rivera/Santa Fe Springs	NB	126	70	82	56	65	73	0	0
Passons Blvd to I-605, Pico Rivera/Santa Fe Springs	SB	278	70	67	51	62	67	0	0
I-605 Fwy to Norwalk Blvd, Santa Fe Springs	NB	71	70	82	61	65	75	0	0
Telegraph Rd to Lakeland Rd, Santa Fe Springs	SB	854	79	63	43	59	65	0	0
Imperial Hwy to Foster Rd, Santa Fe Springs	SB	101	45	68	60	62	68	0	0
La Canada Verde Creek to Valley View Ave, Santa Fe Springs	NB	595	79	68	39	63	68	0	0
Valley View Ave to La Mirada Creek, La Mirada	NB	104	79	68	59	63	68	0	0
La Mirada Creek to Alondra Blvd, La Mirada	NB	104	79	76	59	65	74	0	0
Alondra Blvd to Coyote Creek, La Mirada/Buena Park	NB	99	79	70	59	64	69	0	0
Coyote Creek to Stanton Ave, Buena Park	NB	295	79	72	51	65	71	0	0
Coyote Creek to Stanton Ave, Buena Park	SB	130	79	68	57	63	68	0	0
Stanton Ave to Artesia Ave, Buena Park	NB	29	79	72	67	65	71	4	0
Stanton Ave to Artesia Ave, Buena Park	SB	109	75	64	58	60	65	0	0
Artesia Ave to Brookhurst St, Fullerton	SB	184	79	71	45	65	70	0	0

Location/City	Side of Track	Closest Receiver(s) Distance to Near Track (feet)	Maximum Train Speed (mph)	Existing Noise Level (dBA)	Project Noise Level (dBA)	Noise Impact Criteria (dBA)		Number of Affected Receivers	
						Mod.	Sev.	Mod.	Sev.
Brookhurst St to Euclid St, Fullerton	NB	131	79	67	57	62	68	0	0
Brookhurst St to Euclid St, Fullerton	SB	38	79	68	62	63	68	0	0
Euclid St to S Harbor Blvd, Fullerton	NB	99	79	74	58	65	72	0	0
Euclid St to S Harbor Blvd, Fullerton	SB	62	79	60	62	58	63	4	0
S Harbor Blvd to Fullerton Jct, Fullerton	NB	164	70	74	54	65	73	0	0
S Harbor Blvd to Fullerton Jct, Fullerton	SB	82	70	75	59	65	73	0	0
Fullerton Jct to E Orangethorpe Ave, Fullerton/Anaheim	NB	380	55	68	42	63	68	0	0
Fullerton Jct to E Orangethorpe Ave, Fullerton/Anaheim	SB	48	55	75	59	65	73	0	0
E Orangethorpe Ave to E La Palma Ave, Anaheim	NB	60	79	69	62	64	69	0	0
E La Palma Ave to E Wilhelmina St, Anaheim	NB	59	79	61	62	58	64	82	0
E La Palma Ave to E Wilhelmina St, Anaheim	SB	137	79	61	51	58	64	0	0
E Wilhelmina St to Lincoln Ave, Anaheim	NB	21	90	61	69	58	64	3	38
E Wilhelmina St to Lincoln Ave, Anaheim	SB	33	90	61	63	58	64	14	0
Lincoln Ave to E Santa Ana St, Anaheim	NB	42	90	61	65	58	64	39	18
Lincoln Ave to E Santa Ana St, Anaheim	SB	208	90	61	54	58	64	0	0
E Santa Ana St to E Vermont Ave, Anaheim	NB	50	90	61	64	58	64	57	0
E Santa Ana St to E Vermont Ave, Anaheim	SB	30	90	62	64	59	64	226	0
E Vermont Ave to E Cerritos Ave, Anaheim	NB	396	70	71	48	65	70	0	0
E Cerritos Ave to ARTIC, Anaheim	SB	180	70	71	54	65	70	0	0

Source: Authority 2025
ARTIC = Anaheim Regional Transportation Intermodal Center; dBA = A-weighted decibels; I- = Interstate; Mod. = moderate; mph = miles per hour; NB = northbound; SB = southbound; Sev. = severe

Table 3.4-17 Institutional Noise Impact Assessment for the Project Section

Location/City	Name	Side of Track	Closest Receiver(s) Distance to Near Track (feet)	Maximum Train Speed (mph)	Existing Noise Level (dBA)	Project Noise Level (dBA)	Noise Impact Criteria (dBA)		Number of Affected Receivers	
							Mod.	Sev.	Mod.	Sev.
U.S. 101 to E 1st St, Los Angeles	Mendez High School	NB	974	45	61	32	64	69	0	0
E 1st St to Whittier Blvd, Los Angeles	Monarch Studios	NB	595	50	61	42	59	64	0	0
E 1st St to Whittier Blvd, Los Angeles	Ace Mission Studios	NB	762	50	61	40	59	64	0	0
Whittier Blvd to Redondo Jct, Los Angeles	Downtown Rehearsal	NB	552	50	61	43	59	64	0	0
Whittier Blvd to Redondo Jct, Los Angeles	Corridor Digital Studio	SB	475	50	66	37	61	67	0	0
Whittier Blvd to Redondo Jct, Los Angeles	Orbital Studios	SB	712	50	61	33	59	64	0	0
Whittier Blvd to Redondo Jct, Los Angeles	Void Studios	SB	965	50	61	29	59	64	0	0
Whittier Blvd to Redondo Jct, Los Angeles	Lemon Tree Studios - DTLA	NB	660	50	61	36	59	64	0	0
I-710 to I-5, Commerce	Immediate Medical Center	NB	485	90	73	47	70	77	0	0
Passons Blvd to I-605, Pico Rivera	Plaza de la Raza/ Maizeland Elementary School	NB	347	70	61	42	63	68	0	0
I-605 to Norwalk Blvd, Santa Fe Springs	Our Lady of Perpetual Help	NB	627	70	61	34	63	69	0	0
I-605 to Norwalk Blvd, Santa Fe Springs	Los Nietos Middle School	NB	410	70	58	42	63	69	0	0
Lakeland Rd to Imperial Hwy, Santa Fe Springs	PIH Health Urgent Care Center - Santa Fe Springs	SB	712	45	58	39	62	67	0	0

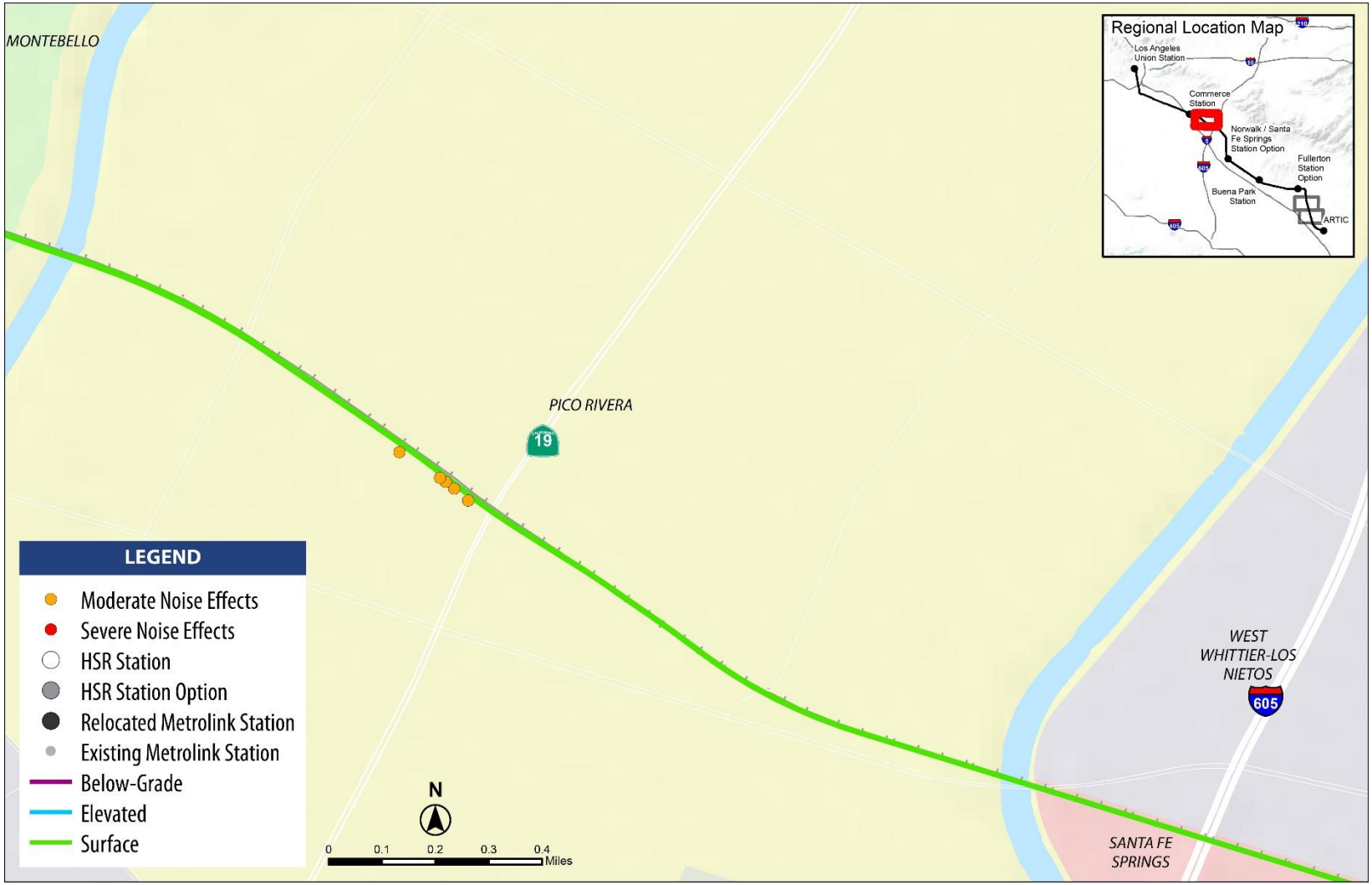
Location/City	Name	Side of Track	Closest Receiver(s) Distance to Near Track (feet)	Maximum Train Speed (mph)	Existing Noise Level (dBA)	Project Noise Level (dBA)	Noise Impact Criteria (dBA)		Number of Affected Receivers	
							Mod.	Sev.	Mod.	Sev.
Imperial Hwy to Foster Rd, Santa Fe Springs	John H. Glenn High School	SB	547	45	61	42	62	67	0	0
Valley View Ave to La Mirada Creek, La Mirada	Neff Park	NB	530	79	70	39	63	68	0	0
Coyote Creek to Stanton Ave, Buena Park	Jesus' Hands Montessori Preschool	SB	445	79	70	42	63	69	0	0
Stanton Ave to Artesia Ave, Buena Park	Praise Chapel of Buena Park	SB	204	75	70	34	69	74	0	0
Brookhurst St to Euclid St, Fullerton	One Spirit Church	SB	593	79	58	35	69	74	0	0
Brookhurst St to Euclid St, Fullerton	Pacific Drive Elementary School	SB	650	79	70	39	69	74	0	0
Brookhurst St to Euclid St, Fullerton	Hunt Branch Library	SB	149	79	57	55	69	74	0	0
Brookhurst St to Euclid St, Fullerton	Grace Korean Ministries	SB	257	79	57	51	69	74	0	0
Euclid St to S Harbor Blvd, Fullerton	Vietnamese Muslim Community	SB	372	79	57	43	61	67	0	0
Euclid St to S Harbor Blvd, Fullerton	Saint Mary's Catholic Church	NB	500	79	57	41	61	67	0	0
Euclid St to S Harbor Blvd, Fullerton	Independence Park	SB	326	79	61	49	61	67	0	0
S Harbor Blvd to Fullerton Jct, Fullerton	Pure Water Church	SB	468	70	73	38	61	67	0	0
S Harbor Blvd to Fullerton Jct, Fullerton	Maverick Theater[1]	SB	87	70 (25)	56	58	61	67	0	0
S Harbor Blvd to Fullerton Jct, Fullerton	Vineyard Fullerton Church[1]	SB	70	70 (25)	60	57	61	67	0	0

Location/City	Name	Side of Track	Closest Receiver(s) Distance to Near Track (feet)	Maximum Train Speed (mph)	Existing Noise Level (dBA)	Project Noise Level (dBA)	Noise Impact Criteria (dBA)		Number of Affected Receivers	
							Mod.	Sev.	Mod.	Sev.
S Harbor Blvd to Fullerton Jct, Fullerton	STAGES Theatre	NB	511	55	61	37	61	67	0	0
S Harbor Blvd to Fullerton Jct, Fullerton	Alt Timelines Video Productions	NB	595	70	61	39	58	64	0	0
E Orangethorpe Ave to E La Palma Ave, Anaheim	Recording Connection Audio Institute	NB	544	79	65	38	66	71	0	0
E Santa Ana St to E Vermont Ave, Anaheim	Thomas Jefferson Elementary School	SB	658	90	67	35	67	72	0	0
E Vermont Ave to E Cerritos Ave, Anaheim	Martinez Granite	NB	462	90	67	43	67	72	0	0
E Cerritos Ave to ARTIC, Anaheim	City National Grove of Anaheim	SB	431	20	67	42	67	72	0	0
E Cerritos Ave to ARTIC, Anaheim	Saddleback Church Anaheim	SB	80	20	67	54	67	72	0	0
E Cerritos Ave to ARTIC, Anaheim	Tru One Records & Rehearsals	NB	373	70	68	41	67	72	0	0
E Cerritos Ave to ARTIC, Anaheim	Iglesia Adventista Del 7mo Dia Hispana Emmanuel	SB	461	70	65	41	67	72	0	0
E Cerritos Ave to ARTIC, Anaheim	Magnolia Park	SB	642	70	67	37	68	73	0	0

Source: Authority 2025

[1] Values in parentheses reflect the Fullerton High-Speed Rail Station Option.

ARTIC = Anaheim Regional Transportation Intermodal Center; dBA = A-weighted decibels; DTLA = Downtown Los Angeles; I- = Interstate; Mod. = moderate; mph = miles per hour; NB = northbound; SB = southbound; Sev. = severe



Source: ESRI 2024

Figure 3.4-8 Locations of Noise Impacts Resulting from Operation, Sheet 1 of 3

Source: ESRI 2024

Figure 3.4-8 Locations of Noise Impacts Resulting from Operation, Sheet 2 of 3

Source: ESRI 2024

Figure 3.4-8 Locations of Noise Impacts Resulting from Operation, Sheet 3 of 3

Shared Passenger Track Alternative B

With the LMF at 15th Street, permanent noise impacts at sensitive receivers during operation would be the same as those described for Shared Passenger Track Alternative A. The alternatives differ only in the LMF site and, because there are no noise-sensitive land uses within 1,000 feet of the 15th Street LMF site, the effects are expected to be the same for Shared Passenger Track Alternative B. Predicted operational noise levels would exceed severe impact criteria at 59 residences and moderate impact criteria at 443 residences. No impacts are predicted to occur at institutional land uses. Operational noise levels are predicted to exceed noise impact criteria at the same residential locations as described for Shared Passenger Track Alternative A. To reduce effects on sensitive receivers from operational noise, the Authority would implement **N&V-MM#3**, which requires the installation of an impervious sound barrier, which would provide effective noise mitigation for 33 of the 59 affected residences. Because a sound barrier would not meet the mitigation guidelines for the remaining 26 residences with severe noise impacts, these residences would have residual severe noise impacts. For these locations, other measures included in **N&V-MM#3** would be implemented, including noise abatement at receiver locations (for example, sound insulation of buildings) and easement acquisition.

High-Speed Rail Station Options

High-Speed Rail Station Option: Norwalk/Santa Fe Springs

With inclusion of the Norwalk/Santa Fe Springs HSR Station Option, impacts would be similar to those of the Shared Passenger Track Alternatives within the station area. With the HSR station option, there would be lower train speeds and lower noise levels in the vicinity of the station. Operational noise levels are not predicted to exceed noise impact criteria and there would be no additional affected receivers. Therefore, permanent noise impacts at sensitive receivers during operation would be less than those described for the Shared Passenger Track Alternatives.

High-Speed Rail Station Option: Fullerton

With inclusion of the Fullerton HSR Station Option, impacts would be similar to those of the Shared Passenger Track Alternatives within the station area. With the HSR station option, there would be lower train speeds and lower noise levels in the vicinity of the station. Operational noise levels are not predicted to exceed noise impact criteria and there would be no additional affected receivers. Therefore, permanent noise impacts at sensitive receivers during operation would be less than those described for the Shared Passenger Track Alternatives.

CEQA Conclusion

The impact under CEQA related to permanent exposure of sensitive receivers to noise generated during project operation would be potentially significant before mitigation. The Authority would implement **N&V-MM#3**, consisting of the installation of an impervious sound barrier extending from 150 feet south of E Cyprus Street to near E Sycamore Street with a setback of approximately 12 feet (or less if feasible) from the proposed northbound track centerline, and with a height of 8 feet above the top-of-rail elevation.

As stated above, the sound barrier will provide effective noise mitigation for 33 of the 59 affected residences. The locations of noise impact caused by project operation (refer to Table 3.4-16) are depicted on Figure 3.4-8 (sheets 1 through 3). For the remaining 26 residences, a sound barrier would not be a feasible mitigation measure. For these locations, other approaches included in **N&V-MM#3** will be implemented, including noise abatement at receiver locations (for example, sound insulation of buildings) and easement acquisition. Although building sound insulation and noise easements may be considered as additional mitigation for HSR operational noise on a case-by-case basis, these measures do not reduce exterior noise levels, which is the metric used in the threshold for determining significance under CEQA. Vehicle noise specifications and special trackwork may reduce noise at the source, but operational noise impacts are still considered significant and unavoidable under CEQA at some locations.

Impact N&V-5: Permanent Exposure of Sensitive Receivers and Buildings to Groundborne Noise and Vibration from Project Operation

Shared Passenger Track Alternative A

The assessment of ground-borne vibration effects from HSR operations in the project section is summarized in Table 3.4-18 for residential land uses and in Table 3.4-19 for institutional land uses. In addition, the assessment of ground-borne noise effects is summarized in Table 3.4-20 for residential land uses and in Table 3.4-21 for institutional land uses. The results include a tabulation of location information for each sensitive receptor or receptor group, the projections of future ground-borne vibration or noise levels, the impact criteria, and whether impacts are projected. The locations of vibration impacts from HSR operations are depicted on Figure 3.4-9 (sheets 1 through 4). These impacts would be permanent.

The results of the assessment indicate that predicted operational ground-borne vibration levels would exceed the impact criteria at 517 residences. No ground-borne vibration impacts are predicted to occur at institutional land uses and no ground-borne noise impacts are projected at any location. Operational vibration levels are predicted to exceed vibration impact criteria at the following residential locations in the project section:

- **Rio Hondo Channel to Rosemead Boulevard (Pico Rivera):** Twenty-eight vibration impacts are projected in this area at single-family residences on the southbound side of the tracks. These impacts would result from the proximity of the receivers to the proposed track and the speed of the train.
- **Brea Creek to Dale Street (Buena Park):** In this area, vibration impacts are projected at 14 residences in 4 multifamily buildings on the northbound side of the tracks. These impacts would be caused by the proximity of the receivers to the proposed track and the speed of the train.
- **E Orangethorpe Avenue to E La Palma Avenue (Anaheim):** Thirteen vibration impacts are projected in this area at single-family residences on the northbound side of the tracks. These impacts would result from the proximity of the receivers to the proposed track and the speed of the train.
- **E La Palma Avenue to E Wilhelmina Street (Anaheim):** Vibration impacts are projected at 72 residences in 12 multifamily buildings in this area on the northbound side of the tracks. These impacts would result from the proximity of the receivers to the proposed track and the speed of the train.
- **E Wilhelmina Street to Lincoln Avenue (Anaheim):** In this area, 39 vibration impacts are projected on the northbound side of the tracks at 3 single-family residences and at 36 residences in 12 multifamily buildings, and on the southbound side of the tracks at 11 single-family residences. These impacts would result from the proximity of the receivers to the proposed track and the speed of the train.
- **Lincoln Avenue to E Santa Ana Street (Anaheim):** In this area, 57 vibration impacts are projected on the northbound side of the tracks at 11 single-family residences and at 46 residences in 7 multifamily buildings. These impacts would result from the proximity of the receivers to the proposed track and the speed of the train.
- **E Santa Ana Street to Vermont Avenue (Anaheim):** In this area, vibration impacts are projected at 57 residences in 23 multifamily buildings on the northbound side of the tracks and vibration impacts are projected at 226 residences in 14 multifamily buildings on the southbound side of the tracks. These impacts would result from the proximity of the receivers to the proposed track and the speed of the train.

To reduce impacts on sensitive receivers from operational vibration, the Authority would implement **N&V-MM#4, Implement Operational Vibration Mitigation Measures**, which requires measures such as vehicle suspension enhancements, special track support systems, and building modifications. However, depending on the effectiveness of these mitigation measures (to be evaluated during project design), there is the potential for post-mitigation adverse effects.

Table 3.4-18 Residential Vibration Impact Assessment for the Project Section

Location/City	Side of Track	Closest Receiver(s) Distance to Near Track (feet)	Maximum Train Speed (mph)	Vibration Levels (VdB)[1]		Number of Affected Receivers
				Project Levels	FRA Impact Criteria	
E 1st St to Whittier Blvd, Los Angeles	SB	388	50	62	72	0
Whittier Blvd to Redondo Jct, Los Angeles	SB	227	50	64	72	0
Santa Ana Fwy to Greenwood Ave, Montebello	NB	570	90	47	72	0
Greenwood Ave to Rio Hondo, Montebello	NB	121	90	54	72	0
Rio Hondo to Rosemead Blvd, Pico Rivera	SB	26	79	80	72	28
Rosemead Blvd to Passons Blvd, Pico Rivera	NB	113	79	72	72	0
Rosemead Blvd to Passons Blvd, Pico Rivera	SB	308	79	66	72	0
Passons Blvd to San Gabriel River Fwy, Pico Rivera/Santa Fe Springs	NB	126	70	70	72	0
Passons Blvd to San Gabriel River Fwy, Pico Rivera/Santa Fe Springs	SB	278	70	65	72	0
San Gabriel River Fwy to Norwalk Blvd, Santa Fe Springs	NB	71	70	66	72	0
Telegraph Rd to Lakeland Rd, Santa Fe Springs	SB	854	79	57	72	0
Imperial Hwy to Foster Rd, Santa Fe Springs	SB	101	45	47	72	0
La Canada Verde Creek to Valley View Ave, Santa Fe Springs	NB	595	79	58	72	0
Valley View Ave to La Mirada Creek, La Mirada	NB	104	79	57	72	0
La Mirada Creek to Alondra Blvd, La Mirada	NB	104	79	57	72	0
Alondra Blvd to Coyote Creek, La Mirada/Buena Park	NB	99	79	57	72	0
Coyote Creek to Stanton Ave, Buena Park	NB	295	79	65	72	0
Coyote Creek to Stanton Ave, Buena Park	SB	130	79	70	72	0
Stanton Ave to Artesia Ave, Buena Park	NB	29	79	80	72	14
Stanton Ave to Artesia Ave, Buena Park	SB	109	75	63	72	0
Artesia Ave to Brookhurst St, Fullerton	SB	184	79	54	72	0

Location/City	Side of Track	Closest Receiver(s) Distance to Near Track (feet)	Maximum Train Speed (mph)	Vibration Levels (VdB)[1]		Number of Affected Receivers
				Project Levels	FRA Impact Criteria	
Brookhurst St to Euclid St, Fullerton	NB	131	79	57	72	0
Brookhurst St to Euclid St, Fullerton	SB	38	79	68	72	0
Euclid St to S Harbor Blvd, Fullerton	NB	99	79	60	72	0
Euclid St to S Harbor Blvd, Fullerton	SB	62	79	65	72	0
S Harbor Blvd to Fullerton Jct, Fullerton	NB	164	70	54	72	0
S Harbor Blvd to Fullerton Jct, Fullerton	SB	82	70	58	72	0
Fullerton Jct to E Orangethorpe Ave, Fullerton/Anaheim	NB	380	55	48	72	0
Fullerton Jct to E Orangethorpe Ave, Fullerton/Anaheim	SB	48	55	63	72	0
E Orangethorpe Ave to E La Palma Ave, Anaheim	NB	60	79	73	72	13
E La Palma Ave to E Wilhelmina St, Anaheim	NB	59	79	74	72	72
E La Palma Ave to E Wilhelmina St, Anaheim	SB	137	79	67	72	0
E Wilhelmina St to Lincoln Ave, Anaheim	NB	21	90	85	72	39
E Wilhelmina St to Lincoln Ave, Anaheim	SB	33	90	81	72	11
Lincoln Ave to E Santa Ana St, Anaheim	NB	42	90	78	72	57
Lincoln Ave to E Santa Ana St, Anaheim	SB	208	90	64	72	0
E Santa Ana St to E Vermont Ave, Anaheim	NB	50	90	77	72	57
E Santa Ana St to E Vermont Ave, Anaheim	SB	30	90	82	72	226
E Vermont Ave to E Cerritos Ave, Anaheim	NB	396	70	60	72	0
E Cerritos Ave to ARTIC, Anaheim	SB	180	70	63	72	0

Source: Authority 2025

[1] Maximum 1/3-octave band vibration velocity level over the frequency range between 8 Hertz and 80 Hertz.

ARTIC = Anaheim Regional Transportation Intermodal Center; FRA = Federal Railroad Administration; mph = miles per hour; NB = northbound; SB = southbound; VdB = vibration decibels

Table 3.4-19 Institutional Vibration Impact Assessment for the Project Section

Location/City	Name	Side of Track	Distance to Near Track (feet)	Train Speed (mph)	Vibration Levels (VdB)[1]		Number of Affected Receivers
					Project Levels	FRA Impact Criteria	
U.S. Hwy 101 to E 1st St, Los Angeles	Mendez High School	NB	974	45	58	75	0
E 1st St to Whittier Blvd, Los Angeles	Monarch Studios	NB	595	50	61	65	0
E 1st St to Whittier Blvd, Los Angeles	Ace Mission Studios	NB	762	50	60	65	0
Whittier Blvd to Redondo Jct, Los Angeles	Downtown Rehearsal	NB	552	50	61	65	0
Whittier Blvd to Redondo Jct, Los Angeles	Corridor Digital Studio	SB	475	50	61	65	0
Whittier Blvd to Redondo Jct, Los Angeles	Orbital Studios	SB	712	50	60	65	0
Whittier Blvd to Redondo Jct, Los Angeles	Void Studios	SB	965	50	59	65	0
Whittier Blvd to Redondo Jct, Los Angeles	Lemon Tree Studios - DTLA	NB	660	50	60	65	0
Long Beach Fwy to Santa Ana Fwy, Commerce	Immediate Medical Center	NB	485	90	47	75	0
Passons Blvd to San Gabriel River Fwy, Pico Rivera	Plaza de la Raza/Maizeland Elementary School	NB	347	70	64	75	0
San Gabriel River Fwy to Norwalk Blvd, Santa Fe Springs	Our Lady of Perpetual Help	NB	627	70	60	75	0
San Gabriel River Fwy to Norwalk Blvd, Santa Fe Springs	Los Nietos Middle School	NB	410	70	62	75	0
Lakeland Rd to Imperial Hwy, Santa Fe Springs	PIH Health Urgent Care Center - Santa Fe Springs	SB	712	45	43	75	0
Imperial Hwy to Foster Rd, Santa Fe Springs	John H. Glenn High School	SB	547	45	43	75	0
Coyote Creek to Stanton Ave, Buena Park	Jesus' Hands Montessori Preschool	SB	445	79	66	75	0
Stanton Ave to Artesia Ave, Buena Park	Praise Chapel of Buena Park	SB	204	75	53	75	0
Brookhurst St to Euclid St, Fullerton	One Spirit Church	SB	593	79	42	75	0
Brookhurst St to Euclid St, Fullerton	Pacific Drive Elementary School	SB	650	79	41	75	0
Brookhurst St to Euclid St, Fullerton	Hunt Branch Library	SB	149	79	55	75	0

Location/City	Name	Side of Track	Distance to Near Track (feet)	Train Speed (mph)	Vibration Levels (VdB)[1]		Number of Affected Receivers
					Project Levels	FRA Impact Criteria	
Brookhurst St to Euclid St, Fullerton	Grace Korean Ministries	SB	257	79	50	75	0
Euclid St to S Harbor Blvd, Fullerton	Vietnamese Muslim Community	SB	372	79	47	75	0
Euclid St to S Harbor Blvd, Fullerton	Saint Mary's Catholic Church	NB	500	79	50	75	0
S Harbor Blvd to Fullerton Jct, Fullerton	Pure Water Church	SB	468	70	49	75	0
S Harbor Blvd to Fullerton Jct, Fullerton	Maverick Theater[2]	SB	87	70 (25)	58 (49)	75	0
S Harbor Blvd to Fullerton Jct, Fullerton	Vineyard Fullerton Church[2]	SB	70	70 (25)	61 (52)	75	0
S Harbor Blvd to Fullerton Jct, Fullerton	STAGES Theatre	NB	511	55	46	75	0
S Harbor Blvd to Fullerton Jct, Fullerton	Alt Timelines Video Productions	NB	595	70	48	65	0
E Orangethorpe Ave to E La Palma Ave, Anaheim	Recording Connection Audio Institute	NB	544	79	60	65	0
E Santa Ana St to E Vermont Ave, Anaheim	Thomas Jefferson Elementary	SB	658	90	60	75	0
E Vermont Ave to E Cerritos Ave, Anaheim	Martinez Granite	NB	462	90	61	75	0
E Cerritos Ave to ARTIC, Anaheim	City National Grove of Anaheim	SB	431	20	49	75	0
E Cerritos Ave to ARTIC, Anaheim	Saddleback Church Anaheim	SB	80	20	59	75	0
E Cerritos Ave to ARTIC, Anaheim	Tru One Records & Rehearsals	NB	373	70	60	75	0
E Cerritos Ave to ARTIC, Anaheim	Iglesia Adventista Del 7mo Dia Hispana Emmanuel	SB	461	70	59	75	0

Source: Authority 2025

[1] Maximum 1/3-octave band vibration velocity level over the frequency range between 8 Hertz and 80 Hertz.

[2] Values in parentheses reflect the Fullerton High-Speed Rail Station Option.

ARTIC = Anaheim Regional Transportation Intermodal Center; DTLA = Downtown Los Angeles; FRA = Federal Railroad Administration; mph = miles per hour; NB = northbound; SB = southbound; VdB = vibration decibels

Table 3.4-20 Residential Ground-Borne Noise Impact Assessment for the Project Section

Location/City	Side of Track	Closest Receiver(s) Distance to Near Track (feet)	Maximum Train Speed (mph)	Ground-Borne Noise Levels (dBA)		Number of Affected Receivers
				Project Levels	FRA Impact Criteria	
Stanton Ave to Artesia Ave, Buena Park	NB	29	79	6	35	0
Artesia Ave to Brookhurst St, Fullerton	SB	184	79	1	35	0

Source: Authority 2025
FRA = Federal Railroad Administration; mph = miles per hour; NB = northbound; SB = southbound; VdB = vibration decibels

Table 3.4-21 Institutional Ground-Borne Noise Impact Assessment for the Project Section

Location/City	Name	Side of Track	Distance to Near Track (feet)	Train Speed (mph)	Ground-Borne Noise Levels (dBA)		Number of Affected Receivers
					Project Levels	FRA Impact Criteria	
E 1st St to Whittier Blvd, Los Angeles	Monarch Studios	NB	595	50	0	25	0
E 1st St to Whittier Blvd, Los Angeles	Ace Mission Studios	NB	762	50	0	25	0
Whittier Blvd to Redondo Jct, Los Angeles	Downtown Rehearsal	NB	552	50	0	25	0
Whittier Blvd to Redondo Jct, Los Angeles	Corridor Digital Studio	SB	475	50	0	25	0
Whittier Blvd to Redondo Jct, Los Angeles	Orbital Studios	SB	712	50	0	25	0
Whittier Blvd to Redondo Jct, Los Angeles	Void Studios	SB	965	50	0	25	0
Whittier Blvd to Redondo Jct, Los Angeles	Lemon Tree Studios - DTLA	NB	660	50	0	25	0
Stanton Ave to Artesia Ave, Buena Park	Praise Chapel of Buena Park	SB	204	75	0	43	0
S Harbor Blvd to Fullerton Jct, Fullerton	STAGES Theatre	NB	511	55	0	43	0
S Harbor Blvd to Fullerton Jct, Fullerton	Alt Timelines Video Productions	NB	595	70	0	25	0
S Harbor Blvd to Fullerton Jct, Fullerton	Maverick Theater[1]	SB	87	70 (25)	18 (9)	43	0
E Cerritos Ave to ARTIC, Anaheim	Tru One Records & Rehearsals	NB	373	70	16	25	0

Location/City	Name	Side of Track	Distance to Near Track (feet)	Train Speed (mph)	Ground-Borne Noise Levels (dBA)		Number of Affected Receivers
					Project Levels	FRA Impact Criteria	
E Cerritos Ave to ARTIC, Anaheim	City National Grove of Anaheim	SB	431	20	3	25	0

Source: Authority 2025

[1] Values in parentheses reflect the Fullerton High-Speed Rail Station Option.

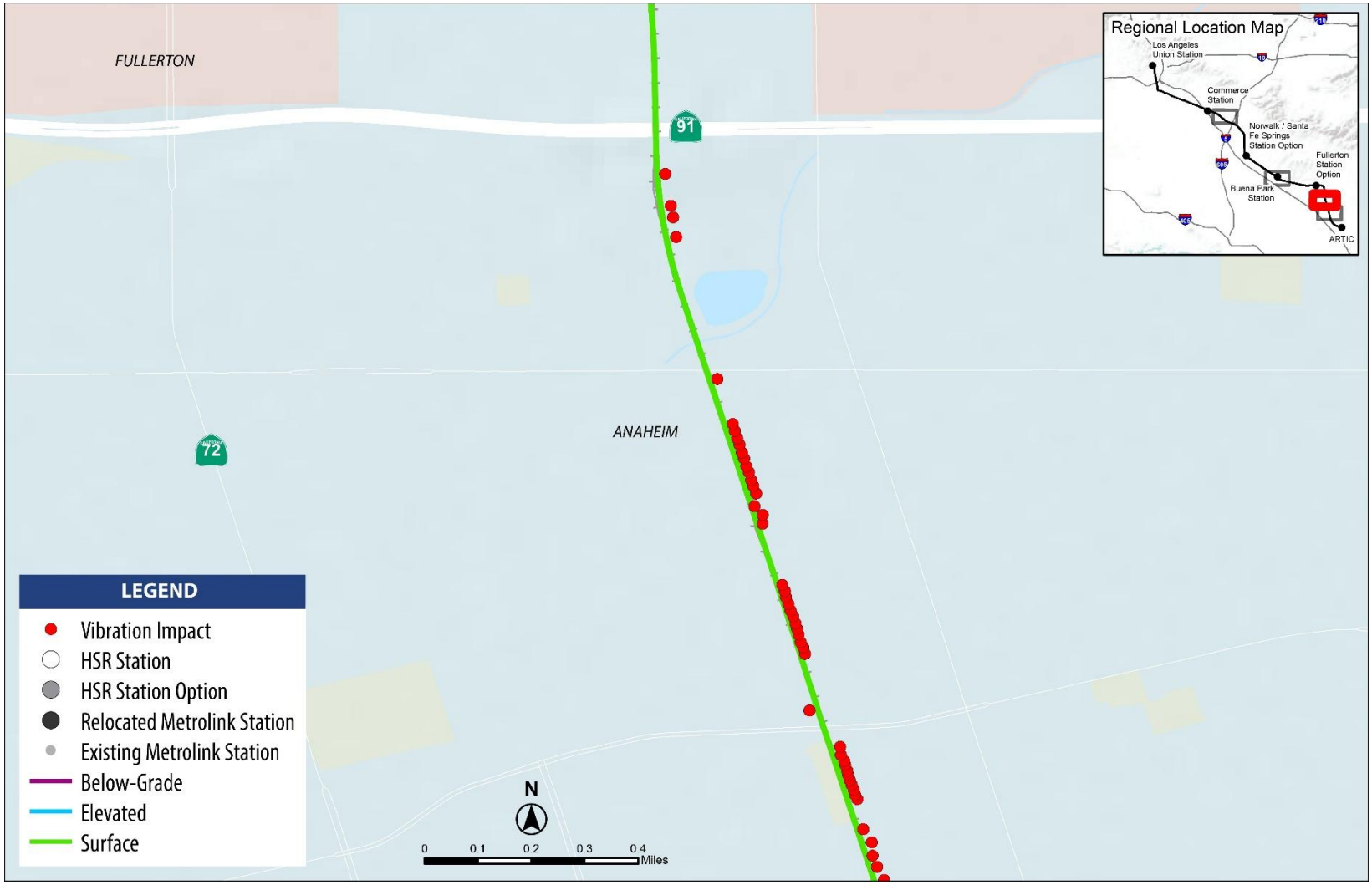
Anaheim Regional Transportation Intermodal Center; dBA = A-weighted decibels; DTLA = Downtown Los Angeles; FRA = Federal Railroad Administration; mph = miles per hour; NB = northbound; SB = southbound

Source: ESRI 2024

Figure 3.4-9 Locations of Vibration Impacts Resulting from Operation, Sheet 1 of 4

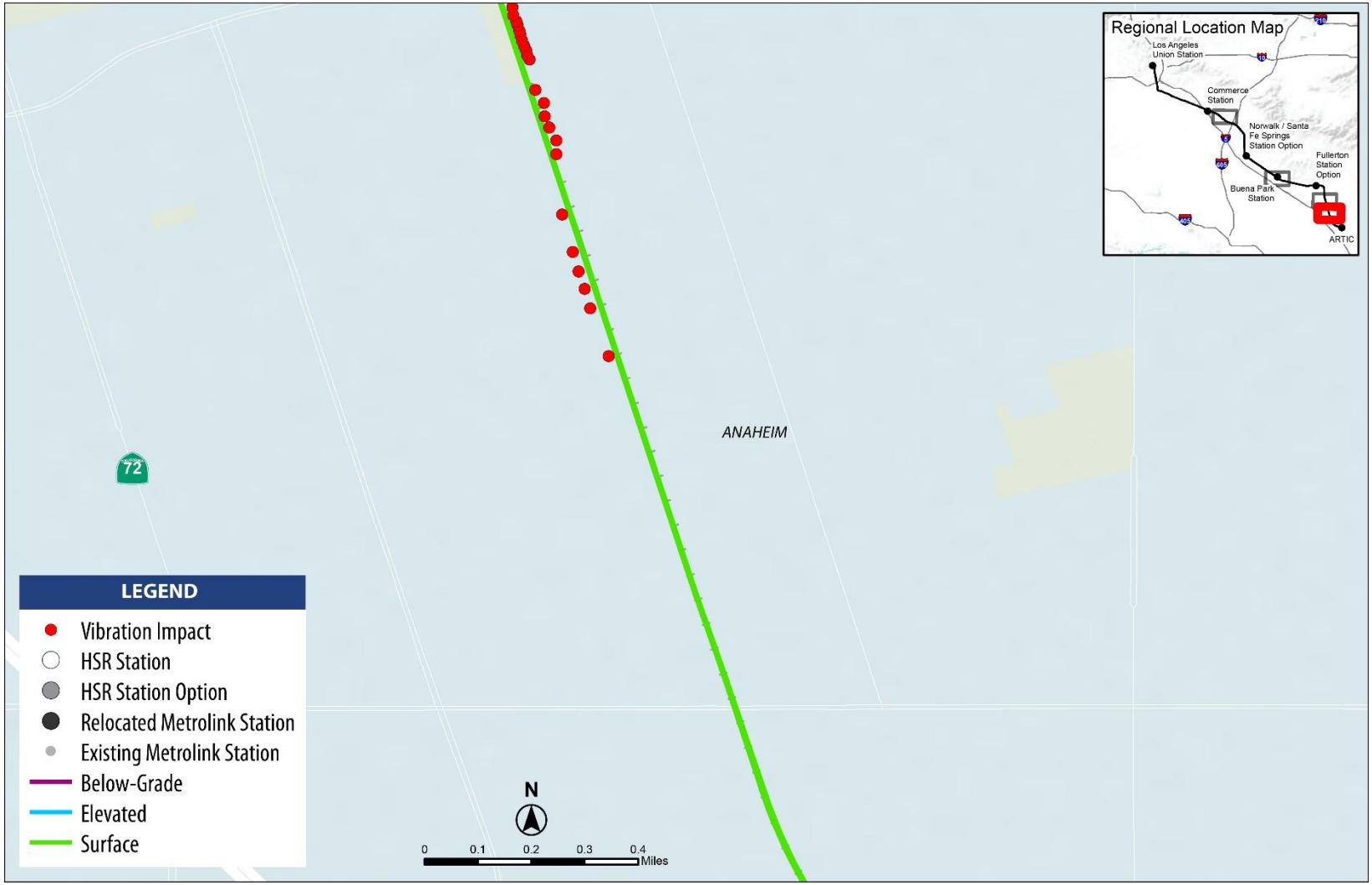
Source: ESRI 2024

Figure 3.4-9 Locations of Vibration Impacts Resulting from Operation, Sheet 2 of 4



Source: ESRI 2024

Figure 3.4-9 Locations of Vibration Impacts Resulting from Operation, Sheet 3 of 4



Source: ESRI 2024

Figure 3.4-9 Locations of Vibration Impacts Resulting from Operation, Sheet 4 of 4

Shared Passenger Track Alternative B

With the LMF at 15th Street, permanent vibration impacts at sensitive buildings during operation would be the same as those described for Shared Passenger Track Alternative A because there are no vibration-sensitive land uses within 1,000 feet of the 15th Street LMF.

High-Speed Rail Station Options

High-Speed Rail Station Option: Norwalk/Santa Fe Springs

With inclusion of the Norwalk/Santa Fe Springs HSR Station Option, impacts would be similar to those of the Shared Passenger Track Alternatives within the station area. With the HSR station option, there would be lower train speeds and lower ground-borne vibration levels in the vicinity of the station. Operational activities would not result in permanent exposure of sensitive receivers and buildings to vibration generated during project operation, and permanent vibration impacts at sensitive buildings during operation would be less than those described for the Shared Passenger Track Alternatives.

High-Speed Rail Station Option: Fullerton

With inclusion of the Fullerton HSR Station Option, impacts would be similar to those of the Shared Passenger Track Alternatives within the station area. With the HSR station option, there would be lower train speeds and lower ground-borne vibration levels in the vicinity of the station. Operational activities would not result in permanent exposure of sensitive receivers and buildings to vibration generated during project operation, and permanent vibration impacts at sensitive buildings during operation would be less than those described for the Shared Passenger Track Alternatives.

CEQA Conclusions

The impact under CEQA related to permanent exposure of sensitive receivers and buildings to vibration generated during project operation would be potentially significant before mitigation. To reduce impacts on sensitive receivers from operational vibration, the Authority would implement **N&V-MM#4**, which includes vehicle suspension enhancements, special track support systems, building modifications, and other measures. In particular, special track support systems such as resiliently supported ties, ballast mats, high-resilience fasteners, and floating track slabs are standard techniques used in the railroad industry to reduce vibration effects and have been used successfully in many railroad and transit system projects worldwide. These measures provide a range of vibration-reduction measures that would be applied, where feasible and effective based on site-specific factors, to reduce the vibration impacts to the FRA threshold criteria level. However, the effectiveness of the vibration-reduction measures necessitated by **N&V-MM#4** requires further evaluation, which would occur during project design when the details of the trainset and track design are known and cannot currently be confirmed. Therefore, the impact under CEQA on sensitive receivers from operational vibration is conservatively concluded to be significant and unavoidable.

Impact N&V-6: Noise Effects on Wildlife and Domestic Animals

Shared Passenger Track Alternative A

As discussed in the *Los Angeles to Anaheim Project Section Noise and Vibration Technical Report* (Authority 2025), domestic and wild birds and mammals near the RSA may be affected by train pass-bys if they are subjected to sound exposure levels of 100 dBA or higher. Assuming a maximum speed of 90 mph, when these species are within 20 feet of the project centerline, they may be affected. However, the project would be fenced, and animal species other than birds would be more than 20 feet from the HSR track. Furthermore, because of the intermittent nature of the train operations, it is expected that the noise environment would only be affected for short periods of time and the project would not affect wildlife (including birds) and domestic animals.

Shared Passenger Track Alternative B

With the LMF at 15th Street, exposure of wildlife and domestic animals to noise at the maintenance facility would be minimal because of its industrial use and the limited nature of the impact within the highly urbanized setting, and noise impacts during operation would be the same as those described for Shared Passenger Track Alternative A. Because of the intermittent nature

of train operations, it is expected that the noise environment would only be affected for short periods of time and the project would not affect wildlife and domestic animals.

High-Speed Rail Station Options

High-Speed Rail Station Option: Norwalk/Santa Fe Springs

With inclusion of the Norwalk/Santa Fe Springs HSR Station Option, impacts would be similar to those of the Shared Passenger Track Alternatives within the station area. With the HSR station option, there would be lower train speeds and noise levels in the vicinity of the station in the highly urbanized setting. Operational noise levels would not result in noise effects on wildlife and domestic animals. Therefore, impacts on wildlife and domestic animals from noise generated during operation would be less than those described for the Shared Passenger Track Alternatives.

High-Speed Rail Station Option: Fullerton

With inclusion of the Fullerton HSR Station Option, impacts would be similar to those of the Shared Passenger Track Alternatives within the station area. With the HSR station option, there would be lower train speeds and lower noise levels in the vicinity of the station within the highly urbanized setting. Operational noise levels would not result in noise effects on wildlife and domestic animals. Therefore, impacts on wildlife and domestic animals from noise generated during operation would be less than those described for the Shared Passenger Track Alternatives.

CEQA Conclusion

The impact under CEQA related to exposure of wildlife and domestic animals to noise generated during project operation would be less than significant because of the limited nature of the impact within the highly urbanized setting of the Shared Passenger Track Alternatives. Therefore, CEQA does not require mitigation.

Impact N&V-7: Traffic Noise

Shared Passenger Track Alternative A

Highway traffic noise generally becomes an important consideration where there is a new roadway project, where a roadway is designed to increase capacity, or where there is a substantial horizontal or vertical alteration in an existing roadway. The analysis of operational traffic noise described in Section 6.4, Operational Traffic Noise, of the *Los Angeles to Anaheim Project Section Noise and Vibration Technical Report* (Authority 2025), indicates that although Shared Passenger Track Alternative A would result in roadway modifications, the changes in traffic associated with these modifications would not result in a noise increase of 12 dBA or greater (which would be considered substantial according to Caltrans Protocol) based on traffic volume data. Therefore, effects from traffic noise during operations are not anticipated for Shared Passenger Track Alternative A.

Shared Passenger Track Alternative B

Because noise from traffic in the area of the 15th Street LMF site would not affect any sensitive location, traffic-generated noise impacts from operation would be the same as those described for Shared Passenger Track Alternative A. Therefore, traffic noise impacts are not anticipated for Shared Passenger Track Alternative B.

High-Speed Rail Station Options

High-Speed Rail Station Option: Norwalk/Santa Fe Springs

With the inclusion of the Norwalk/Santa Fe Springs HSR Station Option, impacts would be the same as those of the Shared Passenger Track Alternatives within the station area. Based on 2040 No Build and Build traffic projections, inclusion of the Norwalk/Santa Fe Springs HSR Station Option would include minor differences in permanent roadway modifications, but they would not result in a noise increase of 12 dBA or greater. Therefore, traffic-generated noise impacts during operation would be the same as those described for the Shared Passenger Track Alternatives.

High-Speed Rail Station Option: Fullerton

With inclusion of the Fullerton HSR Station Option, impacts would be the same as those of the Shared Passenger Track Alternatives within the station area. Based on 2040 No Build and Build traffic projections, inclusion of the Fullerton HSR Station Option would include minor differences in the permanent roadway modifications, but they would not result in a noise increase of 12 dBA or greater. Therefore, traffic-generated noise impacts during operation would be the same as those described for the Shared Passenger Track Alternatives.

CEQA Conclusion

The impact under CEQA from traffic-generated noise during project operation would be less than significant. The increases in traffic noise from roadway modifications are anticipated to be less than the 12 dBA L_{eq} threshold during peak noise hour conditions. Therefore, CEQA does not require mitigation.

Impact N&V-8: Noise from High-Speed Rail Stationary Facilities

Shared Passenger Track Alternative A

Stationary facilities related to the project that generate noise include the HSR station at ARTIC, the 26th Street LMF, and two TPSSs. There are no sensitive receivers within the FRA- and FTA-established estimated impact distances for these facilities; therefore, no operational noise impacts related to stationary facilities are anticipated.

Shared Passenger Track Alternative B

Similar to Shared Passenger Track Alternative A, there are no sensitive receivers within the FRA- and FTA-established estimated impact distances for the 15th Street LMF. All other stationary facilities are the same as for Shared Passenger Track Alternative A. Therefore, no operational noise impacts related to stationary facilities are anticipated.

High-Speed Rail Station Options

High-Speed Rail Station Option: Norwalk/Santa Fe Springs

With inclusion of the Norwalk/Santa Fe Springs HSR Station Option, operational impacts would be the same as those of the Shared Passenger Track Alternatives within the station area. Although operation of the station would generate noise, there are no sensitive receivers within the FRA- and FTA-established estimated impact distances of the Norwalk/Santa Fe Springs HSR Station Option.

High-Speed Rail Station Option: Fullerton

With inclusion of the Fullerton HSR Station Option, operational impacts would be the same as those of the Shared Passenger Track Alternatives within the station area. Although operation of the station would generate noise, there are no sensitive receivers within the FRA- and FTA-established estimated impact distances of the Fullerton HSR Station Option.

CEQA Conclusion

There would be no noise impacts under CEQA from HSR stationary facilities during project operation because there are no sensitive receivers within the FRA- and FTA-established estimated impact distances for these facilities. Therefore, CEQA does not require mitigation.

3.4.7 Mitigation Measures

The Authority has identified the following noise and vibration mitigation measures for impacts under NEPA and significant impacts under CEQA that cannot be avoided or minimized adequately by IAMFs.

3.4.7.1 N&V-MM#1: Construction Noise Mitigation Measures

Prior to construction (ground-disturbing activities), the contractor shall prepare a noise-monitoring program for Authority approval. The noise-monitoring program shall describe how, during construction, the contractor will monitor construction noise to verify compliance with the noise limits (an 8-hour L_{eq}, dBA of 80 during the day and 70 at night for residential land use, 85 for both day and night for commercial land use, and 90 for both day and night for industrial land use)

where a noise-sensitive receiver is present. The contractor will be given the flexibility to meet the FRA construction noise limits in the most efficient and cost-effective manner. This can be done by either prohibiting certain noise-generating activities during nighttime hours or providing additional noise control measures to meet the noise limits. In addition, the noise-monitoring program will describe the actions required of the contractor to meet required noise limits. These actions will include (but are not limited to) the following nighttime and daytime noise control mitigation measures:

- Install a temporary construction site sound barrier near a noise source.
- Avoid nighttime construction in residential neighborhoods.
- Locate stationary construction equipment as far as possible from noise-sensitive sites.
- Reroute construction truck traffic along roadways that would cause the least disturbance to residents.
- During nighttime work, use smart backup alarms, which automatically adjust the alarm level based on the background noise level, or switch off backup alarms and replace with spotters.
- Use low-noise-emission equipment.
- Implement noise-deadening measures for truck loading and operations.
- Monitor and maintain equipment to meet noise limits.
- Line or cover storage bins, conveyors, and chutes with sound-deadening material.
- Use acoustic enclosures, shields, or shrouds for equipment and facilities.
- Use high-grade engine exhaust silencers and engine-casing sound insulation.
- Prohibit aboveground jackhammering and impact pile driving during nighttime hours.
- Minimize the use of generators to power equipment.
- Limit use of public address systems.
- Grade surface irregularities on construction sites.
- Limit or avoid certain noisy activities during nighttime hours.
- To mitigate noise related to impact pile driving, use an auger drill to install the piles instead of a pile driver to reduce noise and vibration levels substantially. If impact pile driving is necessary, limit the time of day that the activity can occur.

The Authority will establish and maintain in operation until completion of construction a toll-free “hotline” regarding the project section construction activities. The Authority shall arrange for incoming messages to be logged (with summaries of the contents of each message) and for a designated representative of the Authority to respond to hotline messages within 24 hours (excluding weekends and holidays). The Authority shall make a reasonable, good faith effort to address concerns and answer questions, and shall include on the log its responses to callers. The Authority shall make a log of the incoming messages and the Authority’s responsive actions publicly available on its website.

The contractor shall provide the Authority with an annual report by January 31 of the following year documenting how it implemented the noise-monitoring program.

3.4.7.2 N&V-MM#2: Construction Vibration Mitigation Measures

Prior to construction involving impact pile driving within 80 feet of a building, the contractor shall provide the Authority with a vibration technical memorandum documenting how project pile driving criteria will be met. Upon approval of the technical memorandum by the Authority, and where a vibration-sensitive receiver is present, the contractor shall comply with the vibration reduction methods described in that memorandum. Potential construction vibration building

damage is only anticipated from impact pile driving at very close distances to buildings. If pile driving occurs more than 80 feet from buildings, or if alternative methods such as push piling or auger piling are used, damage from construction vibration is not expected to occur. When a construction scenario has been established, preconstruction surveys will be conducted by the contractor at locations within 80 feet of pile driving to document the existing condition of buildings in case damage is reported during or after construction. The contractor will arrange for the repair/restoration of damaged buildings to pre-impact condition or will pay compensation to the property owner.

3.4.7.3 N&V-MM#3: Implement California High-Speed Rail Project Noise Mitigation Guidelines

The Authority will examine alternatives to avoid, minimize, or reduce severe noise impacts. If severe noise impacts cannot be avoided, then the Authority would take steps to reduce severe noise substantially through mitigation measures that are reasonable, physically feasible, practical, and cost effective. Various options exist to address the potentially severe noise effects from HSR operations. The Authority has developed Noise Mitigation Guidelines for the statewide HSR system that set forth three categories of mitigation measures to reduce or offset severe noise impacts from HSR operations: sound barriers, sound insulation, and noise easements. The guidelines also set forth an implementation approach that considers multiple factors for determining the reasonableness of sound barriers as mitigation for severe noise impacts, including structural and seismic safety, cost, number of affected receivers, and effectiveness. Sound barrier mitigation will be designed to reduce the exterior noise level from HSR operations from severe to moderate, according to the provisions of the FRA noise and vibration manual (FRA 2012). Where sound barriers are not feasible, sound insulation and noise easements would be considered.

The Noise Mitigation Guidelines, included as Appendix 3.4-A, describe the following mitigation measures and approach.

Sound Barriers

Prior to operation of the project, the contractor will install sound barriers where they can achieve between 5 and 15 dB of exterior noise reduction, depending on their height and location relative to the tracks. The primary requirements for an effective sound barrier are that the barrier must (1) be high enough and long enough to break the line of sight between the sound source and the receiver, (2) be of an impervious material with a minimum surface density of 4 pounds per square foot, and (3) not have gaps or holes between the panels or at the bottom. Because many materials meet these requirements, aesthetics, durability, cost, and maintenance considerations usually determine the selection of materials for sound barriers. Depending on the situation, sound barriers can become visually intrusive. Typically, the sound barrier style is selected with input from the local jurisdiction to reduce the visual effect of barriers on adjacent land uses; refer to *Aesthetic Options for Non-Station Structures* (Authority 2017b). For example, sound barriers could be solid or transparent and made with various colors, materials, and surface treatments. Based on the Noise Mitigation Guidelines, solid barriers would be limited to no more than 6 feet in height and sound barriers would be made of transparent material at heights above 6 feet.

Pursuant to the Noise Mitigation Guidelines, recommended sound barriers must meet the following criteria to be considered a reasonable and feasible mitigation measure:

- The barrier must achieve a minimum of 5 dB of noise reduction.
- The minimum number of affected sites should be at least 10.
- The length should be at least 800 feet.
- The cost must not exceed $95,000 (2018 dollars) per benefited residence.

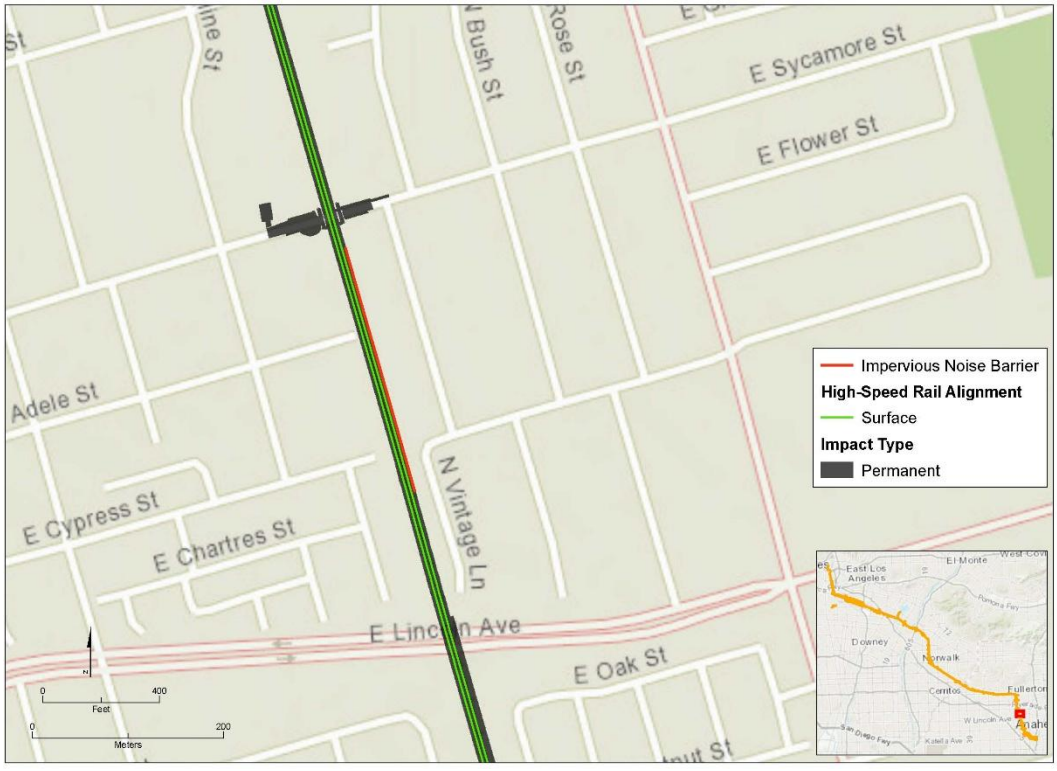
Barrier heights up to a maximum of 14 feet will be considered and mitigation options for areas that require barriers over 14 feet will be studied on a case-by-case basis. For at grade sections, berm and berm/wall combinations are the preferred types of sound barriers where space and other environmental constraints permit. On aerial structures, barrier material will be limited by

engineering weight restrictions for barriers on the structure. Sound barriers will be designed to be as low as possible to achieve a substantial noise reduction.

A sound barrier was determined to be feasible at one location because the barrier is capable of providing a noise level reduction of 5 dB or more to more than 10 affected sites with a barrier length greater than 800 feet. This sound barrier was also determined to be reasonable because the cost to build the barrier will be less than $95,000 (2018 dollars) per benefited receiver. Figure 3.4-10 depicts the proposed sound barrier location, and the reasonableness of this one feasible barrier is as follows:

- Location: 150 feet south of E Cyprus Street to E Sycamore Street, Anaheim
- Side of track: northbound
- Type of barrier: at grade
- Length: 875 feet
- Height: 8 feet
- Surface area: 7,000 square feet
- Total cost: $490,000
- Number of benefited receivers (5 dB or more reduction): 33
- Cost per benefited receiver: $14,848
- Cost in excess of $95,000 per benefited receiver: No
- Reasonable barrier: Yes

Noise modeling will be conducted as part of final design to determine the exact extent of the aforementioned sound barrier and its location relative to noise-sensitive receptors. This model will incorporate final vehicle specifications and existing concrete wall structures that have the potential to affect noise attenuation. If the noise modeling effort triggers changes to the noise impacts or recommendations for mitigation, additional environmental documentation will be prepared, as required by NEPA and CEQA.



Source: Authority 2025

Figure 3.4-10 Location of Proposed Sound Barrier

Sound Insulation

If noise barriers are not proposed for receptors with severe impacts, or if proposed noise barriers do not reduce exterior sound levels to at least a moderate impact level, the Authority will consider building sound insulation as a potential additional mitigation measure on a case-by-case basis. Sound insulation of residences and institutional buildings to improve outdoor-to-indoor noise reduction is a mitigation measure that can be considered when the use of noise barriers is not feasible in providing a reasonable level (5 to 7 dBA) of noise reduction. Although this approach has no effect on noise in exterior areas, it may be the best choice for sites where noise barriers are not feasible or desirable and for buildings where indoor sensitivity is of most concern. Substantial improvements in building sound insulation (on the order of 5 to 10 dBA) can often be achieved by adding an extra layer of glazing to windows, by sealing holes in exterior surfaces that act as sound leaks, and by providing forced ventilation and air conditioning so that windows do not need to be opened.

Noise Easements

If a substantial noise reduction cannot be completed through installation of noise barriers or building sound insulation, the Authority will consider acquiring a noise easement on properties with a severe impact on a case-by-case basis. An agreement between the Authority and the property owner can be established wherein the property owner releases the right to petition the Authority regarding the noise level and subsequent disruptions. This would take the form of a permanent easement that would encompass the property boundaries to the right-of-way of the rail line. The Authority would consider this mitigation measure only in isolated cases where other mitigation is ineffective or infeasible.

3.4.7.4 N&V-MM#4: Implement Operational Vibration Mitigation Measures

Vibration mitigation is more integrated with vehicle characteristics and detailed track design concepts than noise mitigation. Therefore, vibration mitigation will be evaluated during project design as needed in an effort to comply with the FRA criteria. Mitigation for operational vibration impacts can occur at the source, at the sensitive receiver, or along the propagation path from the source to the receiver. Potential measures from the mitigation guidelines include the following:

- **Vehicle Suspension (Source):** Rail vehicles should have low unsprung weight, soft primary suspension, minimum metal-on-metal contact between moving parts of the truck, and smooth wheels that are perfectly round.
- **Special Track Support Systems (Source):** Floating slabs, resiliently supported ties, high-resilience fasteners, and ballast mats help reduce vibration levels from track support system.
- **Building Modifications (Receiver):** For existing buildings, if vibration-sensitive equipment is affected by train vibration, the floor upon which the vibration-sensitive equipment is located could be stiffened and isolated from the remainder of the building. For new buildings, the building foundation should be supported by elastomer pads similar to bridge bearing pads.
- **Buffer Zones (Receiver):** Negotiate a vibration easement from the affected property owners or expand rail right-of-way.

Because there are site-specific factors to consider, such as train speed, the presence of special trackwork, soil type, and vibration propagation characteristics, further studies during the subsequent engineering phases of the project should evaluate these site-specific conditions where vibration mitigation is indicated to determine the mitigation design requirements. Such studies would include additional vibration propagation tests to narrow down the site-specific vibration estimates and engineering evaluation of the special track support options. However, it may not be possible to fully mitigate all vibration impacts and therefore some vibration impacts would be potentially significant and unavoidable with mitigation.

3.4.7.5 Impact of Mitigation

Mitigation measures **N&V-MM#1**, **N&V-MM#2**, and **N&V-MM#4** are focused on noise and vibration control methods at the source. Therefore, there would be no secondary effects related to implementation of these mitigation measures. If enclosures or barriers are used during construction, they would only be used temporarily and removed once work is complete.

N&V-MM#3 includes building and installing permanent sound barriers, and noise mitigation in the form of sound barriers is the most common of the options available for **N&V-MM#3**. At the one location where a sound barrier has been determined to be feasible, residential buildings are located close to the corridor so that sound barriers would only limit views to the track itself. In addition, transparent materials are required for sound barriers above a height of 6 feet. Therefore, there would be no secondary effects associated with implementation of **N&V-MM#3** and no substantial changes to the environment would occur as a result of these mitigation measures. For this reason, it is expected that impacts from these mitigation measures would be less than significant under CEQA.

3.4.7.6 Early Action Projects

Table 3.4-22 lists the mitigation measures required for the early action projects.

Table 3.4-22 Mitigation Measures Required for Early Action Projects

Early Action Project	Impacts	Mitigation Measures
Pioneer Boulevard Grade Separation	N&V-1: Temporary Exposure of Sensitive Receivers to Construction Noise ▪ Significant impact of noise contributions in exceedance of noise standards or ambient noise levels	N&V-MM#1
	N&V-2: Temporary Exposure of Sensitive Receivers and Buildings to Vibrations from Construction	N&V-MM#2
Norwalk Boulevard Grade Separation	N&V-1: Temporary Exposure of Sensitive Receivers to Construction Noise ▪ Significant impact of noise contributions in exceedance of noise standards or ambient noise levels	N&V-MM#1
State College Boulevard Grade Separation	N&V-1: Temporary Exposure of Sensitive Receivers to Construction Noise ▪ Significant impact of noise contributions in exceedance of noise standards or ambient noise levels	N&V-MM#1
	N&V-2: Temporary Exposure of Sensitive Receivers and Buildings to Vibrations from Construction ▪ Significant impact of vibration contributions in exceedance of ground-borne vibration standards during construction	N&V-MM#2
Buena Park Metrolink Station Relocation	N&V-1: Temporary Exposure of Sensitive Receivers to Construction Noise ▪ Significant impact of noise contributions in exceedance of noise standards or ambient noise levels	N&V-MM#1
	N&V-2: Temporary Exposure of Sensitive Receivers and Buildings to Vibrations from Construction ▪ Significant impact of vibration contributions in exceedance of ground-borne vibration standards during construction	N&V-MM#2

Early Action Project	Impacts	Mitigation Measures
Fullerton Interlocker	N&V-1: Temporary Exposure of Sensitive Receivers to Construction Noise Significant impact of noise contributions in exceedance of noise standards or ambient noise levels	N&V-MM#1
	N&V-2: Temporary Exposure of Sensitive Receivers and Buildings to Vibrations from Construction Significant impact of vibration contributions in exceedance of ground-borne vibration standards during construction	N&V-MM#2

3.4.8 NEPA Impacts Summary

This section summarizes the impacts of the Shared Passenger Track Alternatives and compares them to the anticipated impacts of the No Project Alternative.

3.4.8.1 No Project Alternative

The No Project Alternative would include future development, including both suburban expansion and development in existing urban areas. This future development would include additional rail traffic from other planned projects within the existing rail alignment that may result in a perceptible increase in noise levels at adjacent receivers. Planned projects in the area would potentially increase noise from traffic sources; however, increases in noise from traffic sources would not be perceptible relative to existing conditions. Vibration is generally a localized effect and would not be perceptible at sensitive uses except those directly adjacent to construction activity; however, vibration from other planned projects may intermittently result in perceptible vibration at sensitive receiver locations.

3.4.8.2 Shared Passenger Track Alternatives

Construction of the Shared Passenger Track Alternatives would result in the following impacts:

- **Impact N&V-1:** Temporary increases in noise levels at sensitive receivers in the vicinity of construction areas would occur. Noise-sensitive receivers at distances of up to 645 feet of a construction zone for the project section may be exposed to noise levels exceeding the FRA criteria for daytime hours (between 7:00 a.m. to 10:00 p.m.) for one or more phases of construction. Noise-sensitive receivers at distances of up to 2,038 feet of a construction zone may be exposed to noise levels exceeding the FRA criteria for nighttime hours (10:00 p.m. to 7:00 a.m.) for one or more phases of construction. It is estimated that construction noise impacts could temporarily occur at a total of 1,379 Category 2 (residential) receivers and at four Category 3 (institutional) receivers (including a theater, a library, and two churches) during daytime construction. During nighttime construction it is estimated that noise impacts could temporarily occur at a total of 7,855 residences; nighttime impacts are only applicable to Category 2 receivers. With implementation of **N&V-MM#1** at locations where needed, the effect of increased noise from construction would be reduced for the project.
- **Impact N&V-2:** Construction activity with the greatest potential for damaging vibration effects would be pile driving, which could affect structures at distances of up to 30 feet for the least sensitive buildings, and at distances of up to 77 feet for the most sensitive buildings. As such, the potential for vibration damage from pile driving is limited to two commercial buildings near the Coyote Creek/North Fork water crossing and two residential buildings near the Brea Creek water crossing that are within 77 feet of these construction sites. Human annoyance or interference from construction vibration would be expected within a distance of up to 500 feet, depending on the type of land use and type of equipment used. This increase in vibration levels would result in a temporary adverse impact. With implementation of **N&V-MM#2** at

locations where needed, the effect of increased vibration from construction would be reduced for the project.

- **Impact N&V-3:** Based on the projected increases in peak-hour traffic volumes on the anticipated detour routes during construction, there would be no significant noise impacts related to rerouted traffic.

Operational noise and vibration would result in the following adverse impacts:

- **Impact N&V-4:** There would be severe noise impacts at 59 residential receivers as a result of operation of the project. There would be no noise impacts from HSR operation at institutional locations. With implementation of **N&V-MM#3** at locations where needed, the effect from increased noise levels would be reduced for the project. In addition, because train horn noise would be eliminated at some locations with implementation of the grade separations that are part of this project, such locations would experience a beneficial noise effect.
- **Impact N&V-5:** There would be vibration impacts at 517 residences as a result of operation of the project. No ground-borne vibration impacts are predicted to occur at institutional land uses and no ground-borne noise impacts are projected at any location. With implementation of **N&V-MM#4** at locations where needed, the effect from increased vibration levels would be reduced for the project. However, depending on the effectiveness of these mitigation measures (to be evaluated during project design), there is the potential for post-mitigation adverse effects.
- **Impact N&V-6:** Because of the intermittent nature of the train operations, it is expected that the noise environment would only be affected for short periods of time and that project operation would not affect wildlife and domestic animals.
- **Impact N&V-7:** Traffic increases from roadway modifications from the project are not expected to result in significant noise effects.
- **Impact N&V-8:** No operational noise impacts related to stationary project facilities are anticipated.

Table 3.4-23 presents a comparison of the potential impacts of the project alternatives.

Table 3.4-23 Comparison of Project Alternatives Impacts on Noise and Vibration

Impacts	Shared Passenger Track Alternative A	Shared Passenger Track Alternative B	With Inclusion of HSR Station Option		NEPA Conclusion Before Mitigation	Mitigation	NEPA Conclusion Post Mitigation			
			Norwalk/Santa Fe Springs	Fullerton			Shared Passenger Track Alternative A	Shared Passenger Track Alternative B	With Inclusion of HSR Station Option: Norwalk/Santa Fe Springs	With Inclusion of HSR Station Option: Fullerton
Impact N&V-1: Temporary Exposure of Sensitive Receivers to Construction Noise	Temporary noise impacts at noise-sensitive locations could occur at a total of 1,379 Category 2 (residential) receivers and at four Category 3 (institutional) receivers during daytime construction and at a total of 7,855 residences during nighttime construction. Construction noise would result in an impact for sensitive receivers within the estimated impact distances presented in Table 3.4-13 in the cities of Los Angeles, Vernon, Bell, Commerce, Montebello, Pico Rivera, Whittier, Norwalk, Santa Fe Springs, La Mirada, Buena Park, Fullerton, and Anaheim.	Same as Shared Passenger Track Alternative A.	Same impacts as the Shared Passenger Track Alternatives within the station area.	Similar impacts to the Shared Passenger Track Alternatives within the station area.	Adverse effect (all alternatives and HSR station options)	N&V-MM#1	No adverse effect	No adverse effect	No adverse effect	No adverse effect
Impact N&V-2: Temporary Exposure of Sensitive Receivers to Vibration from Construction	Temporary vibration impacts at vibration-sensitive locations could exceed the residential annoyance criterion of 72 VdB at distances of up to 290 feet from construction activities. Construction vibration would result in a temporary impact because perceptible temporary increases in vibration levels are expected for sensitive receivers within the vibration estimated impact distances for one or more construction activity presented in Table 3.4-15. Vibration damage could occur at four structures within 77 feet of pile-driving sites	Same as Shared Passenger Track Alternative A.	Same impacts as the Shared Passenger Track Alternatives within the station area.	Same impacts as the Shared Passenger Track Alternatives within the station area.	Adverse effect (all alternatives and HSR station options)	N&V-MM#2	No adverse effect	No adverse effect	No adverse effect	No adverse effect
Impact N&V-3: Temporary Traffic-Generated Noise from Rerouting Traffic During Construction	Because the estimated increases in traffic noise are less than 12 dBA, there would be no adverse noise impacts related to rerouted traffic.	Same as Shared Passenger Track Alternative A.	Same impacts as the Shared Passenger Track Alternatives within the station area.	Same impacts as the Shared Passenger Track Alternatives within the station area.	No adverse effect (all alternatives and HSR station options)	No mitigation needed	N/A	N/A	N/A	N/A
Impact N&V-4: Permanent Exposure of Sensitive Receivers to Noise from Project Operation	Predicted operational noise levels would result in 59 permanent severe noise impacts (before mitigation); potential to reduce 33 of these impacts with mitigation.	Same as Shared Passenger Track Alternative A.	Similar impacts as the Shared Passenger Track Alternatives within the station area. With the HSR station option, there would be lower train speeds and lower noise levels in the vicinity of the station.	Similar impacts as the Shared Passenger Track Alternatives within the station area. With the HSR station option, there would be lower train speeds and lower noise levels in the vicinity of the station.	Adverse effect (all alternatives and HSR station options)	N&V-MM#3	Adverse effect	Adverse effect	Adverse effect	Adverse effect

Impacts	Shared Passenger Track Alternative A	Shared Passenger Track Alternative B	With Inclusion of HSR Station Option		NEPA Conclusion Before Mitigation	Mitigation	NEPA Conclusion Post Mitigation			
			Norwalk/Santa Fe Springs	Fullerton			Shared Passenger Track Alternative A	Shared Passenger Track Alternative B	With Inclusion of HSR Station Option	
									Norwalk/Santa Fe Springs	Fullerton
Impact N&V-5: Permanent Exposure of Sensitive Receivers and Buildings to Ground-Borne Noise and Vibration from Project Operation	Predicted operational ground-borne vibration levels would result in 517 permanent vibration impacts (before mitigation); potential to reduce these impacts with mitigation (to be evaluated during project design).	Same as Shared Passenger Track Alternative A.	Similar impacts as the Shared Passenger Track Alternatives within the station area. With the HSR station option, there would be lower train speeds and lower ground-borne vibration levels in the vicinity of the station.	Similar impacts as the Shared Passenger Track Alternatives within the station area. With the HSR station option, there would be lower train speeds and lower ground-borne vibration levels in the vicinity of the station.	Adverse effect (all alternatives and HSR station options)	N&V-MM#4	Adverse effect	Adverse effect	Adverse effect	Adverse effect
Impact N&V-6: Noise Effects on Wildlife and Domestic Animals	Exposure of wildlife and domestic animals to noise generated during project operation would be limited within the highly urbanized setting of the project section and would not be adverse.	Same as Shared Passenger Track Alternative A.	Similar impacts as the Shared Passenger Track Alternatives within the station area. With the HSR station option, there would be lower train speeds and lower noise levels in the vicinity of the station.	Similar impacts as the Shared Passenger Track Alternatives within the station area. With the HSR station option, there would be lower train speeds and lower noise levels in the vicinity of the station.	No adverse effect (all alternatives and HSR station options)	No mitigation needed	N/A	N/A	N/A	N/A
Impact N&V-7: Traffic Noise	No traffic noise impacts are anticipated.	Same as Shared Passenger Track Alternative A.	Same impacts as the Shared Passenger Track Alternatives within the station area.	Same impacts as the Shared Passenger Track Alternatives within the station area.	No adverse effect (all alternatives and HSR station options)	No mitigation needed	N/A	N/A	N/A	N/A
Impact N&V-8: Noise from High-Speed Rail Stationary Facilities	There are no sensitive receivers within the FRA- and FTA-established estimated impact distances for these facilities; therefore, no operational noise impacts related to stationary facilities are anticipated.	Same as Shared Passenger Track Alternative A.	Same impacts as the Shared Passenger Track Alternatives within the station area.	Same impacts as the Shared Passenger Track Alternatives within the station area.	No adverse effect (all alternatives and HSR station options)	No mitigation needed	N/A	N/A	N/A	N/A

dBA = A-weighted decibels; FRA = Federal Railroad Administration; FTA = Federal Transit Administration; HSR = high-speed rail; L_{eq} = equivalent noise level; N/A = not applicable; NEPA = National Environmental Policy Act; TBD = to be determined; VdB = vibration decibels

3.4.9 CEQA Significance Conclusions

As described in Section 3.4.4.6, Method for Determining Significance Under CEQA, the impacts of projects under CEQA are evaluated against thresholds to determine whether a project would result in no impact, a less-than-significant impact, or a significant impact. Table 3.4-24 contains a summary of the CEQA determination of significance for all construction and operational impacts for the Shared Passenger Track Alternatives.

Under CEQA, significant impacts remain after mitigation because some noise-sensitive receivers might still experience operational noise levels that are considered severe even after installation of sound barriers. Building sound insulation and noise easements may be considered as additional mitigation for HSR operational noise on a case-by-case basis, but these measures do not reduce exterior noise levels, which is the metric used in the threshold for determining significance under CEQA. Vehicle noise specifications and special trackwork may reduce noise at the source, but operational noise impacts are still considered significant and unavoidable at some locations.

Table 3.4-24 CEQA Significance Conclusions for Noise and Vibration

Impact	Impact Description and CEQA Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation	Source of Impact
Construction				
Impact N&V-1: Temporary Exposure of Sensitive Receivers to Construction Noise	Potentially significant for both project alternatives. Construction activity noise would exceed FRA standards at sensitive receptors.	N&V-MM#1	Less than significant	All alternatives and options
Impact N&V-2: Temporary Exposure of Sensitive Receivers to Vibration from Construction	Potentially significant for both project alternatives. Construction activity vibration would exceed FRA standards at sensitive receptors.	N&V-MM#2	Less than significant	All alternatives and options
Impact N&V-3: Temporary Traffic-Generated Noise from Rerouting Traffic During Construction	Because the estimated increases in traffic noise are less than 12 dBA, noise impacts related to rerouted traffic would be less than significant for both project alternatives.	No mitigation measures are required	Not applicable	All alternatives and options
Operation				
Impact N&V-4: Permanent Exposure of Sensitive Receivers to Noise from Project Operation	Potentially significant for both project alternatives. The new source of severe noise resulting from train operations would substantially degrade the user experience at 59 residences for both project alternatives.	N&V-MM#3	Significant and unavoidable at 26 residences	All alternatives
Impact N&V-5: Permanent Exposure of Sensitive Receivers and Buildings to Vibration from Project Operation	Potentially significant for both project alternatives. The new source of vibration resulting from train operations would substantially degrade the user experience at 517 residences for both project alternatives.	N&V-MM#4	Significant and unavoidable	All alternatives

Impact	Impact Description and CEQA Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation	Source of Impact
Impact N&V-6: Noise Effects on Wildlife and Domestic Animals	Exposure of wildlife and domestic animals to noise generated during project operation would be limited within the highly urbanized setting of the project section and would be less than significant for both project alternatives.	No mitigation measures are required	Not applicable	All alternatives and options
Impact N&V-7: Traffic Noise	Less than significant for both project alternatives. Additional vehicular traffic at HSR stations and LMFs would increase ambient noise levels in the project vicinity above levels existing without the project.	No mitigation measures are required	Not applicable	All alternatives and options
Impact N&V-8: Noise from High-Speed Rail Stationary Facilities	There are no sensitive receivers within the FRA- and FTA-established estimated impact distances for these facilities; therefore, no operational noise impacts related to stationary facilities are anticipated for either project alternative.	No mitigation measures are required	Not applicable	All alternatives and options

CEQA = California Environmental Quality Act; FRA = Federal Railroad Administration; FTA = Federal Transit Administration; LMF = light maintenance facility