3.13 Noise and Vibration

This section evaluates the potential long-term effects of the No Build Alternative and the Build Alternative on noise and vibration, as detailed in in **Appendix L** (Noise and Vibration Impacts Report). Short-term construction effects are discussed in **Section 3.17** (Construction).

The assessment of reasonably foreseeable effects in this section is based upon the geographic and temporal proximity parameters detailed in **Chapter 3.0** (Introduction).

3.13.1 Affected Environment

The Study Area for this analysis includes the area within a 0.5-mile to 2-mile radius from the guideway centerline described in **Section 3.1.1** (Study Area) with a focus on the sensitive receptors within 350 feet or less of the Build Alternative. Sensitive receptors within the Build Alternative's screening distance are predominantly residential, and also include institutional receptors, schools, a library and a park. The location of sensitive receptors is shown in **Attachment A** of **Appendix L**.

Noise and Vibration Screening Distances for Sensitive Receptors

- **Noise:** 350 feet unobstructed from the guideway centerline
- **Vibration:** 150 feet unobstructed from the guideway centerline
- **Source:** In accordance with the FTA Transit Noise and Vibration Impact Assessment Manual (FTA 2018) and based on typical LRT systems adjusted to reflect Study Area-specific conditions.

Figure 3.13-1 and **Table 3.13-1** identify noise monitoring locations for the Build Alternative, which were selected based on surrounding land uses (e.g., the Build Alternative's proximity to sensitive receptors) and the Build Alternative's potential noise profile. Located in an urban corridor of mixed residential, industrial and commercial land uses, the high ambient noise conditions, based on the noise monitoring results and identified in **Table 3.13-2**, reflect the proximity of residences to heavily-used transportation corridors.

Regulations related to noise and vibration applicable to the Project are summarized in **Appendix S** (Regulatory Setting Summary) and detailed in **Appendix L**.

Table 3.13-1 Baseline Noise Levels Measured along the Project Corridor (in A-weighted decibel)

Noise Monitoring Location Number[1]	Receptor Noise Measurement Location	Land Use Type	FTA Land Use Categories[2]	24-Hour Day-Night Noise Level	Peak-Hour Equivalent Sound Level
M01	376 South Woods Avenue	Single-Family Residence	2	62	63
M02	5224 ½ Via Corona Street	Single-Family Residence	2	66	65
M03	743 Amalia Avenue	Single-Family Residence	2	58	59
M04	740 ½ Woods Avenue	Single-Family Residence	2	57	57
M05	668 South Atlantic Boulevard	School	3	—[3]	63
M06	860 Washington Boulevard	Single-Family Residence	2	71	68

Source: CDM Smith/AECOM JV 2026, ***Appendix L****.*

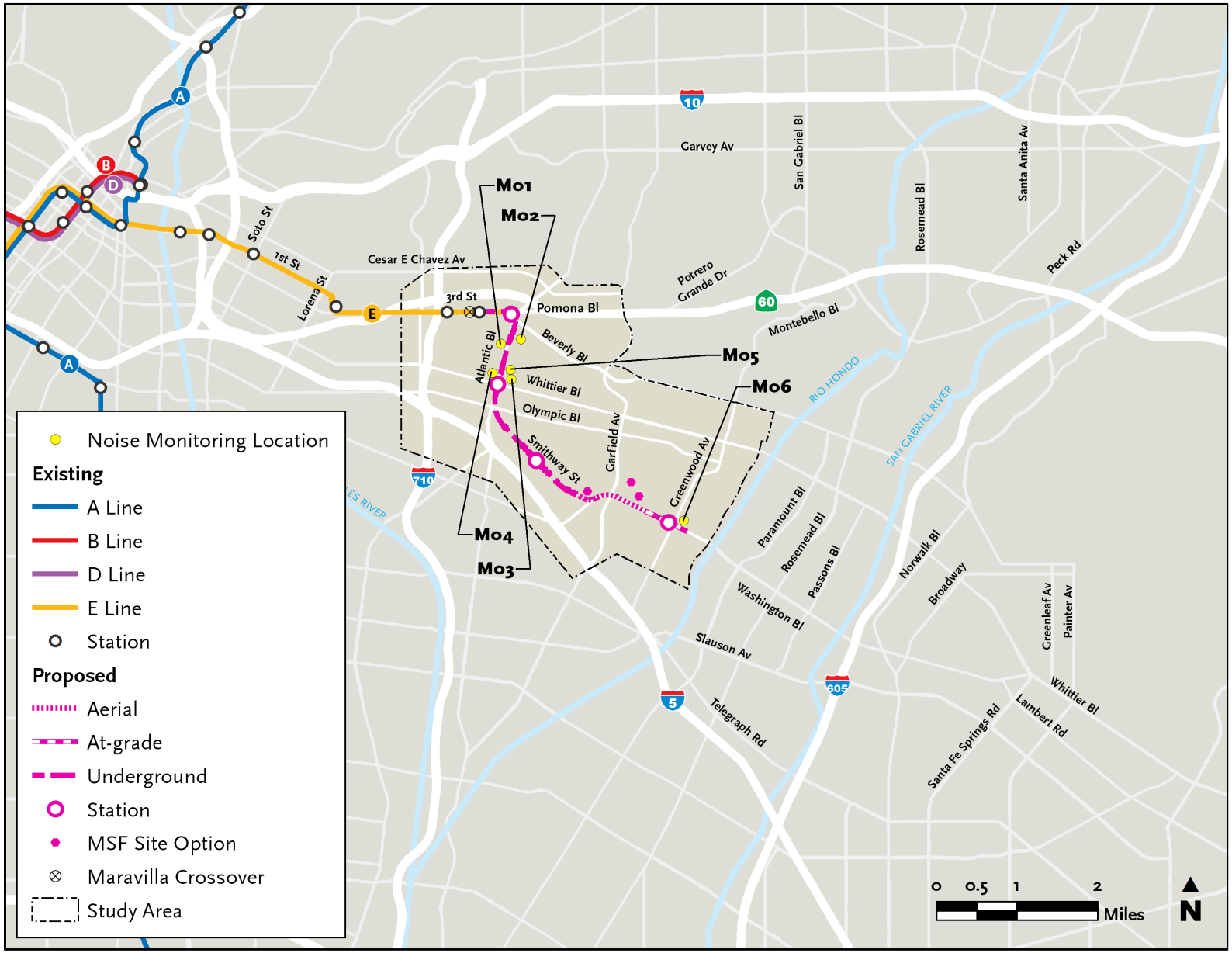
Notes:

[1] Refer to **Figure 3.13-1** and **Attachment A** in **Appendix L** for locations of representative noise measurements.

[2] FTA Land Use Categories: Category 1 - high sensitivity, Category 2 - residential, and Category 3 - institutional.

[3] The day-night noise level is not applicable to institutional land uses.

Key: — = Not applicable



Source: CDM Smith/AECOM JV 2026.

Figure 3.13-1 Noise Monitoring Locations

3.13.2 No Build Alternative

The No Build Alternative, as described in **Section 2.2** (No Build Alternative) of the EA, would include already planned and funded roadway and transit projects but would not provide a rail transit option for communities in eastern Los Angeles County. Overall, as shown in **Table 3.13-2**, the No Build Alternative would not substantially change or impact existing noise or vibration levels and would result in no long-term adverse noise or vibration effect.

Table 3.13-2 Noise Impact Summary – No Build Alternative

Topic	Impact	Rationale
Noise and Vibration	No Adverse Effect	▪ Future noise and vibration levels under the No Build Alternative are anticipated to be similar to those under existing conditions. ▪ Already planned regional transit and roadway projects would adhere to existing regulations to reduce noise effects

Source: Metro; CDM Smith/AECOM JV 2026.

3.13.3 Build Alternative

3.13.3.1 Long-Term Noise Effects

Reasonably foreseeable long-term noise effects of the Build Alternative are summarized in **Table 3.13-3** for the same representative receptor locations used to monitor current noise levels (see **Figure 3.13-1**) based on FTA criteria. The predicted corridor-wide noise effects are summarized in **Table 3.13-4**.

Noise along the Build Alternative would be primarily due to passbys[13] from light rail transit vehicles for receptors near the aerial and at-grade guideway configurations and stationary noise sources (such as stations, the parking facility, the MSF, or special trackwork such as switches). Noise generated by passby of light rail transit vehicles would not exceed the FTA severe noise impact criteria at any sensitive receptors because of the distance of receptors from the alignment and/or intervening structures, high existing ambient noise levels near receptors, and because a portion of the alignment would be underground.

Noise from warning bells at Build Alternative at-grade crossings (proposed at Vail Avenue, Maple Avenue, and Greenwood Avenue) would be adjacent to manufacturing and commercial properties with high existing ambient noise levels, and therefore, there would be no adverse effects. Special trackwork (e.g., turnouts and crossovers) would not exceed the FTA severe noise impact criteria at any sensitive receptors because surrounding land uses are primarily industrial and commercial with high existing ambient noise levels, and there would be no adverse effect.

Traction power substations[14] create noise with a continuous hum. As identified in NPM NOI-1 (Construction Noise Plan and Noise Monitoring Plan), each traction power substation would be at-grade and designed according with the Metro Rail Design Criteria noise guideline of 45 A-weighted decibel at 50 feet or at the setback line of the nearest building or occupied area, whichever is closer. The predicted operating noise level of the traction power substations would be much lower than existing ambient noise levels (which range from 57 A-weighted decibel, 24-hour day-night noise level to 68 A-weighted decibel, peak-hour equivalent sound level) and light rail transit passby noise levels of 78 A-weighted decibel at 50 feet. Therefore, noise from traction power substations would not exceed the FTA noise impact criteria at any receptors along the Build Alternative, and no adverse effect would occur.

[13] A passby refers to the event of a transit vehicle (e.g., train, light rail vehicle, or bus) moving past a specific location.
[14] Traction power substations are transformers that "step-up" the voltage necessary to operate the trains.

Table 3.13-3 Operational Noise Levels at Representative Receptors (in A-weighted decibel)

Receptor Identification Number[1]	Receptor Noise Measurement Location	Land Use Type	FTA Land Use Categories[2]	Existing Noise	Build Noise[3]	FTA Criteria Moderate[4]	FTA Criteria Severe	Significant Impact? (Build noise greater than FTA "Severe Criteria")
M01	376 South Woods Avenue	Single-Family Residence	2	62	—[5]	59	65	No
M02	5224 ½ Via Corona Street	Single-Family Residence	2	66	—[5]	62	68	No
M03	743 Amalia Avenue	Single-Family Residence	2	58	—[5]	57	63	No
M04	740 ½ Woods Avenue	Single-Family Residence	2	57	—[5]	57	63	No
M05	668 South Atlantic Blvd	School	3	63	—[5]	65	71	No
M06	860 Washington Blvd	Single-Family Residence	2	71	66	**66**	71	No

Source: CDM Smith/AECOM JV 2026, ***Appendix L****.*

Notes:

[1] See **Attachment A** in **Appendix** L for receptor locations.

[2] FTA Land Use Categories: Category 1–high sensitivity, Category 2–residential, and Category 3–institutional.

[3] The "Build Noise" levels represent the future Project noise only. The cumulative future ambient noise with the Project would be equal to the "Existing Noise" logarithmically added to the "Build Noise."

[4] FTA moderate impacts are **bold** and **underlined**.

[5] These are not applicable because during operations, the alignment at this receptor would be located underground in a tunnel.

Key: — = Not applicable

Table 3.13-4 Corridor-Wide Project Noise Effects

Nearest Identification Number[1]	Location	Land Use Type	Impact (Moderate or Severe)	No. Residences Affected	Major Source(s) Contributing to Impact
M06	860 Washington Boulevard	Single-Family Residence	Moderate	1	Light Rail Transit Passbys
—	—	FTA Category 2	Severe	0	—
—	—	FTA Category 2	Moderate	1	—
—	—	**FTA Category 2**	**Total**	**1**	—

Source: CDM Smith/AECOM JV 2026, ***Appendix L****.*

Note:

[1] See **Attachment A** in **Appendix L** for receptor locations.

Key: — = Not applicable

One noise-sensitive historic property used as a residence, the Kelly House, is approximately 80 feet away from the crossover east of Greenwood station. There are high levels of existing noise from Washington Boulevard at this location (see Location M06 in **Table 3.13-1**). One historic property used as a school, the Greenwood Elementary School, is also adjacent to the Build Alternative, although outside of the FTA screening distance

(refer to **Appendix L**, Table 4-1 for the FTA screening distance for noise assessments). As shown in **Table 3.13-5**, the Build Alternative noise effects at these locations are moderate and no adverse effects would occur.

Table 3.13-5 Summary of Noise Levels at Historic Properties along the Project Alignment (in A-weighted decibel)[1]

Receptor Identification Number[2]	Receptor Description	Type	FTA Land Use Categories[3]	Existing Noise	Build Noise[4]	FTA Criteria Moderate	FTA Criteria Severe
HP1	Kelly House	Historic	2	71	65	65	70
HP2	Greenwood Elementary School	Historic	3	68	56	68	73

*Source: CDM Smith/AECOM JV 2026, **Appendix L**.*

Notes:

[1] The day-night noise level noise level is reported.

[2] See **Attachment A** in **Appendix L** for receptor locations.

[3] FTA Land Use Categories: Category 1 – high sensitivity, Category 2 – residential, and Category 3 – institutional.

[4] The "Build Noise" levels represent the future Project noise only. The cumulative future ambient noise with the Project would be equal to the "Existing Noise" logarithmically added to the "Build Noise."

The receptors located above the underground tunnel alignment would not be affected by noise. The Arts in Action Community Charter Elementary School and Greenwood Elementary School would have potential noise effects. Both schools are screened by existing structures and outside the FTA screening distance of 175 feet. Noise levels at both schools would not exceed the FTA severe noise impact criteria and no adverse effects would occur.

The Maravilla Crossover would be approximately 250 feet away from the Griffith STEAM Magnet Middle School grounds and would involve a minor shift of the existing track within the existing right-of-way. A train control house would be constructed on the south side of 3rd Street adjacent to existing traction power substations. The train control house would meet the same design noise criteria as the existing traction power substations. Noise levels at this school would not exceed the FTA severe noise impact criteria and no adverse effects would occur.

As summarized in **Table 3.13-6**, four non-residential receptors that would potentially be impacted by noise were identified along the Build Alternative. None of the Build Alternative noise levels at the park, schools, and library are predicted to exceed the FTA moderate or severe impact criteria along the Build Alternative alignment. No adverse effects would occur.

Table 3.13-6 Potential Sensitive Receptors along the Build Alternative Alignment (in A-weighted decibel)[1]

Receptor[2] Description	Land Use Type	FTA Land Use Categories[3]	Existing Noise	Build Noise[4]	FTA Criteria Moderate	FTA Criteria Severe
Chet Holifield Park	Park	3	68	45	68	73
Chet Holifield Library	Library	3	68	48	68	73
Greenwood Elementary School	School	3	68	56	68	73
Arts in Action	School	3	63	56	65	71

*Source: CDM Smith/AECOM JV 2026, **Appendix L**.*

Notes:

[1] Peak-hour Equivalent Sound Level noise levels are reported for all receptors.

[2] See **Attachment A** in **Appendix L** for receptor locations.

[3] FTA Land Use Categories: Category 1 – high sensitivity, Category 2 – residential, and Category 3 – institutional.

[4] The "Build Noise" levels represent the future Project noise only. The cumulative future ambient noise with the Project would be equal to the "Existing Noise" logarithmically added to the "Build Noise."

MSF Site 1, 2, or 3 would be in an industrial area and would have no noise-sensitive receptors (such as residences, schools, churches, or parks) within the FTA screening distance of 650 feet with intervening buildings (refer to **Appendix L**, Table 4-1). Therefore, no long-term adverse effects would occur.

3.13.3.2 Long-Term Vibration Effects

Transit vibration levels were predicted at the same receptor locations as those used for the noise analysis. As shown in **Table 3.13-7**, except for representative Receptor M05 (KIPP Raices Academy and Esperanza College Prep School), all of the vibration levels at the representative receptor sites are predicted to be below the FTA frequent impact criteria.

Table 3.13-7 Potential Vibration Levels at Representative Receptors from the Build Alternative (in vibration decibel)

Receptor Identification Number[1]	Receptor Vibration Receptor Location	Land Use Type	FTA Land Use Categories[2]	Build Vibration[3]	FTA Criteria "Frequent"	FTA Criteria Adverse Effect?
M01	376 South Woods Avenue	Single-family Residence	2	52	72	No
M02	5224 ½ Via Corona Street	Single-family Residence	2	68	72	No
M03	743 Amalia Avenue	Single-family Residence	2	62	72	No
M04	740 ½ Woods Avenue	Single-family Residence	2	64	72	No
M05	KIPP Raices Academy, 668 South Atlantic Boulevard and Esperanza College Prep School, 414 South Atlantic Boulevard	School	3	**80**	75	Yes
M06	860 Washington Boulevard	Single-family Residence	2	66	72	No

Source: CDM Smith/AECOM JV 2026, ***Appendix L****.*

Notes:

[1] See **Attachment A** in **Appendix L** for receptor locations.

[2] FTA Land Use Categories: Category 1 – high sensitivity Category 2 – residential, and Category 3 – institutional

[3] Exceedances of the FTA frequent criteria are **bold** and **underlined**.

As shown in **Table 3.13-8**, corridor-wide vibration levels are predicted to exceed the FTA frequent criterion of 72 vibration velocity levels at 56 residences. These effects are due to the proximity of residences to proposed switches and to the tunnel section of the alignment. Additionally, two vibration impacts exceeding the criteria of 75 vibration decibels are predicted at the FTA Category 3 receptors, KIPP Raices Academy at 668 Atlantic Boulevard and Esperanza College Prep School at 414 Atlantic Boulevard. The predicted Build Alternative vibration effects are shown in **Attachment A** in **Appendix L**. Mitigation measures, presented in **Section 3.13.4**, would be implemented to reduce adverse vibration effects. NMM NOI-11 (Operational Vibration Mitigation — Tunnel) would require the use of track support systems[15] to reduce vibratory effects

Switches allow trains to move from one track to another. Noise from switches comes from a small gap in the central part of the switch.

When the steel LRT wheel hits this gap, train noise levels could increase in the vicinity of the switch.

[15] Track support systems incorporate resilience, such as ballast mats, high resilience track fasteners, resiliently supported ties or floating track slabs. High resilience fasteners typically reduce vibration by 5 decibels, ballast mats by 10 decibels, and floating slab track bed by 15 decibels.

caused by steel wheels rolling over steel rails at rail joints during the pass by of light rail transit vehicles at residences, and NMM NOI-12 (Operational Vibration Mitigation) would reduce vibratory levels by reducing the width of gaps at joints when steel wheels roll over steel rails at rail joints.

Table 3.13-8 Corridor-wide Project Vibration and Ground-Borne Noise Effects Along the Build Alternative

FTA Category	Nearest Id. Number[1]	Location	Type Use	Impact (Frequent)	Number of Properties Affected	Major Source(s) Contributing to Effect[2]
FTA Category 2	M01	376 South Woods Avenue	Single-Family Residence	Frequent	12	Crossover
FTA Category 2	M02	5224 ½ Via Corona Street	Single-Family Residence	Frequent	6	Crossover
FTA Category 2	M02	5224 ½ Via Corona Street	Multi-Family Residence	Frequent	3	Crossover
FTA Category 2	—[3]	Area local to East Olympic Boulevard	Single-Family Residence	Frequent	28	Operations
FTA Category 2	—[3]	Area local to East Olympic Boulevard	Multi-Family Residence	Frequent	7	Operations
Total FTA Category 2	**—**	**—**	**—**	**Frequent**	**56**	**—**
FTA Category 3	M05	KIPP Raices Academy, 668 South Atlantic Boulevard and Esperanza College Prep School, 414 South Atlantic Boulevard	School	Frequent	2	Operations
Total FTA Category 3	**—**	**—**	**—**	**Frequent**	**2**	**—**
Total – All Uses	**—**	**—**	**—**	**Total**	**58**	**—**

Source: CDM Smith/AECOM JV 2026, ***Appendix L****.*

Notes:

[1] See **Figure 3.13-1** and **Attachment A** in **Appendix L** for receptor locations.

[2] Major sources include light rail transit passbys, light rail transit warning bells, and switches or special trackwork. The MSF and traction power substations are not expected to be a major source of impacts in any noise-sensitive locations.

[3] There are no ambient noise measurement locations close to these vibration-impacted properties.

Key: **—** = not applicable; Id. = identification

The crossover east of Greenwood station is approximately 80 feet from the William and Florence Kelly House (860 Washington Boulevard), a single-family residence and historic property. The Build Alternative would not impact this vibration sensitive historic property, given its distance from the alignment. Similarly, the Build Alternative would not impact the vibration sensitive historic property at the Greenwood Elementary School, given its distance from the alignment.

Maximum vibration levels at two institutional receptors (KIPP Raices Academy and Esperanza College Prep School) are predicted to reach 80 vibration decibels, exceeding the FTA frequent impact criteria as shown in **Table 3.13-9**. However, compliance with NMM NOI-11 and NMM NOI-12 would reduce adverse effects caused by steel wheels rolling over steel rails at rail joints during the passby of light rail transit vehicles at these sensitive receptors. Thus, with implementation of NMM NOI-11 and NMM NOI-12, there would be no adverse long-term vibration effects on institutional receptors.

Table 3.13-9 Summary of Project Vibration Levels at Parks, Schools, and Other Institutional Receptor Sites Along the Build Alternative (in vibration decibel)

Receptor Identification Number	Receptor Description	Type Land Use	FTA Land Use Categories[1]	Build Vibration[2]	FTA Criteria "Frequent"	FTA Criteria Adverse Effect
M05	KIPP Raices Academy, 668 South Atlantic Boulevard and Esperanza College Prep School, 414 South Atlantic Boulevard	School	3	**80**	75	Yes

Source: CDM Smith/AECOM JV 2026, ***Appendix L****.*

Notes: Due to attenuation over large distances, the predicted vibration level is below detection level and well below the ambient background level. Therefore, it is not perceptible.

[1] FTA Land Use Categories: Category 1 – high sensitivity Category 2 – residential, and Category 3 – institutional.

[2] Exceedances of the FTA frequent criteria are **bold** and **underlined**.

MSF Sites 1, 2 and 3 are in a predominantly industrial area; there are no vibration-sensitive receptors (such as residences, schools, churches, or parks) located within the FTA screening distance of 150 feet. Therefore, vibration generated from slow-moving light rail transit vehicles over switches and other special trackwork at the MSF would not exceed the FTA vibration impact criteria at any of the closest receptors, and no long-term adverse vibration effects would occur.

3.13.4 Avoidance, Minimization, and Mitigation Measures for the Build Alternative

The measures identified in **Table 3.13-10** would be implemented for the Build Alternative in the long-term. Construction measures are provided in **Section 3.17**.

Table 3.13-10 Long-Term Avoidance, Minimization, and Mitigation Measures

Topic	Potential Effect	Proposed Measure	Measure Type	Effects After Implementation of Measure(s)
Noise	Potential noise effects from traction power substations that create noise with a continuous hum	**NPM NOI-1 (Operational Design Standards for Noise).** Operational (post-Project) design standards for the Project may include but are not limited to: ▪ Design per Metro Rail Design Criteria (MRDC) to reduce operational noise of the traction power substations (TPSS) which would mandate the location of TPSS to be 45 A-weighted decibels (dBA) at 50 feet or at the setback line of the nearest building or occupied area, whichever is closer.	Project Measure	**No Adverse Effect** - Operational design standards for the Build Alternative would be implemented
Vibration	Potential vibration effects from the proximity of sensitive receptors to the proposed tunnel	**NMM NOI-11 (Operational Vibration Mitigation — Tunnel).** Within the tunnel, Metro shall reduce operational vibration impacts through the use of track support systems which incorporate resilience, such as ballast mats, high resilience track fasteners, resiliently supported ties or floating track slabs as necessary to be below Federal Transit Administration (FTA) criteria for frequent annoyance from operational vibration, with the decision to be made through final design. FTA criteria for frequent annoyance is an exceedance of 72 vibration decibels (VdB) at residential uses and 75 VdB at daytime institutional uses, including schools, for more than 70 events per day.	Mitigation Measure	**No Adverse Effect** - potential vibratory effects on sensitive receptors in proximity to the tunnel during operation of the Build Alternative would be reduced
Vibration	Potential vibration effects from the proximity of sensitive receptors to proposed switches	**NMM NOI-12 (Operational Vibration Mitigation)**. Metro shall reduce vibration impacts where necessary to be below Federal Transit Administration (FTA) criteria for frequent annoyance due to gaps at switches by methods such as installing ballast mats or other resilient fixings under conventional switches to “decouple” the train vibration from the track supporting structure, or using a monoblock frog or other low vibration switches. FTA criteria for frequent annoyance from operational vibration is an exceedance of 72 vibration decibels (VdB) at residential uses and 75 VdB at daytime institutional uses including schools for more than 70 events per day.	Mitigation Measure	**No Adverse Effect** - potential vibratory effects on sensitive receptors in proximity to switches during operation of the Build Alternative would be reduced

Source: CDM Smith/AECOM JV 2026, ***Appendix L****.*