Chapter 11 Noise and Vibration

11.1 INTRODUCTION

This chapter evaluates the operational effects of the Build Alternative on noise and vibration levels in the study area. Changes to noise or vibration at nearby land uses could occur from operations at the Main Facility site or near the new substations and emergency generators at HBLR Headquarters (the "nanogrid"). Once installed, the electrical lines (which are included in Project Components C through G) and utility connections would not have an impact on noise and vibration in the study area. There will be no change to noise or vibration near residential or commercial properties once the project is operational since there will be no increase in number or frequency of trains as a result of the proposed Project. Noise and vibration effects that would result from the proposed Project's construction are presented in Chapter 17, "Construction Effects."

11.2 REGULATORY CONTEXT AND METHODOLOGY

11.2.1 FTA Guidance

The FTA *Transit Noise and Vibration Impact Assessment Manual* (FTA Report No. 0123 September 2018), ("FTA Noise & Vibration Manual") sets forth the methods and procedures for determining the level of nuisance noise and vibration impact resulting from federally-funded transit projects. It outlines a three-step approach for the analysis of noise and vibration: a screening procedure to identify whether any sensitive uses are located within a distance that could be affected by the project; a general assessment methodology to identify locations with the potential for impacts if sensitive land use is located within the screening distances; and, a detailed analysis, if warranted, from the results of the general assessment (FTA 2018).

Table 4-3 (noise) and Table 6-1 (vibration) of the FTA Noise & Vibration Manual define criteria based on the specific type of land use that would be affected, as follows:

- **Category 1 (High Sensitivity):** For noise, land where quiet is an essential element of the intended purpose (e.g., outdoor amphitheaters and concert pavilions, national historic landmarks with considerable outdoor use and recording studios and concert halls). For vibration, buildings where low ambient vibration is essential for the operations within the building (e.g., vibration-sensitive research and manufacturing, hospitals, and university research operations);

- **Category 2 (Residential):** For noise and vibration, residences and buildings where people normally sleep (e.g., homes, hospitals, and hotels);

- **Category 3 (Institutional):** For noise, institutional land uses with daytime and evening use (e.g., schools, libraries, theaters, parks/recreational areas and churches) where avoiding speech

interference is critical. For vibration, schools, churches, other institutions, and quiet offices that do not have vibration-sensitive equipment, but still have the potential for activity interference;

- **Special Buildings (Table 6-1 only)**: For vibration only, a fourth category includes special-use facilities that are very sensitive to vibration noise that are not included in the categories above and require special consideration (e.g., concert halls, TV and recording studios and theaters.

If it is determined that there are no sensitive land uses within screening distances that are identified to encompass all potentially impacted locations, then no further noise analysis is needed. If one or more sensitive land uses are within the screening distances, then further analysis is needed. While no screening distances are presented in the FTA Noise & Vibration Manual for new power generating facilities, according to Table 4-7 of the FTA Noise & Vibration Manual a screening distance for noise from power substations is 250 feet. Transit projects that do not involve vehicles do not have potential for vibration impact and do not require further analysis, as stated in the FTA Noise & Vibration Manual. Since the proposed Project will not increase the number or frequency of trains in the service area, a vibration impact analysis is not required for this project. Construction impacts are descripted in Chapter 17, "Construction Effects."

It is acknowledged in the FTA Noise & Vibration Manual that since its methods have been developed to assess typical transit projects, there will be some situations not explicitly covered and the exercise of professional judgment is required to extend the basic methods in these cases.

11.2.2 Redevelopment Area Performance Standards

The Redevelopment Plan indicates that all uses shall comply with the Category C environmental performance standards found in N.J.A.C. § 19:4-7.3 (2013) (noise) and N.J.A.C. § 19:4-7.4 (2013) (vibration) (NJMC 2013). In accordance with the noise performance standard, noise generated by the new facilities shall not exceed 76 A-weighted decibels (dBA) on or beyond the zone boundaries (notwithstanding the exceptions). This level may be exceeded by 10 dBA for a single period not to exceed 15 minutes in any one day. For impact noise, this level may be increased by 20 dBA. In accordance with the vibration performance standard, maximum allowable peak particle velocities (PPV) shall not exceed 0.10 inches per second on or beyond the zone boundaries. Maximum allowable PPV from impact vibrations (i.e., discrete impulses that do not exceed 60 per minute), shall not exceed 0.20 inches per second on or beyond the zone boundaries.

11.3 AFFECTED ENVIRONMENT

The Koppers Koke Site is currently undeveloped and lies within an industrial area. The location of the new Kearny Substation (part of Preferred Alternative Project Component D) is adjacent to the heavily used Northeast Corridor. The location of the new NJ TRANSITGRID East Hoboken Substation (part of Preferred Alternative Project Component E) is in close proximity to the heavily used Hoboken Terminal & Yard. The nanogrid (Preferred Alternative Project Component F) is located on NJ TRANSIT-owned property that is already used for transportation purposes. The nearest sensitive receptors to the Main Facility site and proposed new Kearny Substation are residences and parkland located more than 0.9 miles and 0.7 miles

away, respectively. The nearest sensitive receptor for the new NJ TRANSITGRID East Hoboken Substation is approximately 330 feet away (Category 2 - Residential). As discussed in Chapter 3 "Land Use, Zoning and Public Policy" high-density residential dwellings (Category 2 - Residential) are located within the 500-ft buffer of the HBLR Headquarters in Jersey City, which is the location of the proposed nanogrid (Preferred Alternative Project Component F). However, the nanogrid will be installed at a location within the NJ TRANSIT-owned property that is greater than 600 feet from the nearest sensitive land use and the emergency generators would be installed within a sound-proofed enclosure in order to prevent an increase to noise levels during emergency conditions. As a result, there are no noise- sensitive receptors in FTA Categories 1, 2 or 3 within any of FTA's screening distances according to Table 4-7 of the FTA Manual for the proposed Main Facility site, the new Kearny Substation, the NJ TRANSITGRID East Hoboken Substation or the emergency generators for the nanogrid at HBLR Headquarters.

11.4 PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

11.4.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed and NJ TRANSIT and Amtrak would continue to be served by the existing commercial grid. Without the microgrid, commuter and intercity rail service in Amtrak's and NJ TRANSIT's core service territory would remain vulnerable to power outages. Under the No Action Alternative, other planned and programmed transportation improvements for which commitment and financing have been identified would take place by 2021. These include projects in NJ TRANSIT's Resilience Program, Amtrak initiatives that will affect operations on the Northeast Corridor, and HCIA plans for warehousing development on portions of the Koppers Koke property.

In the absence of the proposed Project, Amtrak has plans to completely replace and rebuild Substation No. 41. Amtrak is currently proceeding with reconstruction of certain elements of Substation No. 42, located east of the project area at the entrance to the North River Tunnels in Weehawken, NJ, including the installation of a new Control House. Under the No Action Alternative, NJ TRANSIT intends to acquire the 20-acre parcel (Preferred Alternative Project Component A) on the Koppers Koke property as well as the six-acre parcel (Preferred Alternative Project Component B) located south of the Morris & Essex Line (due to a property settlement, as described in Chapter 2, "Project Alternatives"). Under the No Action Alternative, the 20 acres that NJ TRANSIT is acquiring would likely be used for ancillary railroad purposes.

11.4.2 Build Alternative

Based on the FTA screening procedures, no general or detailed assessments of transit noise are warranted since there are no sensitive land uses within screening distances according to Table 4-7 of the FTA Manual that could be affected by the proposed Project. Noise levels at sensitive receptor locations, which are located more than 0.7 miles away for the Main Facility and new Kearny Substation, over 330 feet for the new NJ TRANSITGRID East Hoboken Substation, and over 600 feet for the nanogrid, would not change as a result of the proposed Project. Since the proposed Project will not increase the number or frequency of trains in the service area, a transit vibration impact analysis is not required for this project.

To analyze the operational noise impacts of the Main Facility, substations, and "nanogrid," this study analyzed noise and vibration using NJDEP Noise Control Standards as well as local municipal noise ordinances. According to the NJDEP Noise Control Standards, the noise level should not exceed a continuous airborne sound of 65 dBA or an impulsive sound of 80 dBA from 7:00 A.M. to 10:00 P.M. The noise level should not exceed a continuous airborne sound of 50 dBA during nighttime hours. The noise level standards for NJDEP are presented in Table 11-1, along with noise level standards for municipalities where they differ from NJDEP.

Table 11-1: Noise Levels for New Jersey and Municipalities

Municipality	Time	Limit
NJDEP – Night	10:00 pm to 7:00 am	50 dBA
NJDEP – Day	7:00 am to 10:00 pm	65 dBA continuous; 80 dBA impulse
Bayonne	6:00 pm to 7:00 am, weekdays; 6:00 pm to 9:00 am, weekends & holidays	65 dBA
Hoboken	7:00 am to 10:00 pm	65 dBA continuous; 80 dBA impulse
Jersey City	24-hours	65 dBA
Kearny – Day	11:00 am to 10:00 pm	65 dBA
Kearny – Night	10:00 pm to 11:00 am	50 dBA
Newark – Day	7:00 am to 8:00 pm, except Sunday	65 dBA
Newark – Night	8:00 pm to 7:00 am, and all Sunday	50 dBA
Secaucus	24-hours	65 dBA
Union City, construction activities	9:00 am to 8:00 pm	83 dBA at 25 ft, or 86 dBA at project boundary
West New York	6:00 pm to 7:00 am, weekdays; 6:00 pm to 9:00 am, weekends & holidays	65 dBA

The Main Facility, the new substations, and the nanogrid would be designed to meet all applicable noise and vibration standards. Normal operations of the Main Facility would not cause vibration impacts. Steam blows are required to clear equipment of construction debris (e.g., welding slag), and would not be required during normal operations or maintenance. This activity is discussed in greater detail in Chapter 17, "Construction Effects." Once operational, noise from the proposed Project would be minimal in residential or other sensitive areas due to the industrial setting of the Main Facility and distance to sensitive receptors from the new NJ TRANSITGRID East Hoboken Substation and the nanogrid. Sound levels from the Main Facility are expected to be 85 dBA at a distance of 3.3 feet from the equipment. This sound level would drop to 50 dBA at a distance of 185 feet, so no sensitive or non-sensitive receptors would be impacted by noise levels. During emergency scenarios where the commercial power grid is not active, the emergency generators for the nanogrid (Preferred Alternative Project Component F) would be operational to provide power to the southern portion of the HBLR. The equipment would be located more than 600 feet from the nearest sensitive receptor and the equipment would be installed within noise-attenuating enclosures in order to minimize increases in noise levels during operation, so no adverse impacts would occur from the one-hour of monthly testing or from the full-time operation during

emergency conditions. Noise and vibration impacts for construction activities are discussed in Chapter 17, "Construction Effects."

11.5 SUMMARY OF SIGNIFICANT ADVERSE IMPACTS AND MITIGATION MEASURES

Once operational, noise from the proposed Project would be minimal in residential or other sensitive areas due to the industrial setting of the Main Facility and distance to sensitive receptors from the new NJ TRANSITGRID East Hoboken Substation and the nanogrid at HBLR Headquarters. No mitigation measures are required with the proposed design, which includes noise-attenuating enclosures for the nanogrid.