Exhibit M. Crenshaw Boulevard between 48th Street and Exposition Boulevard (2)

Existing

Crenshaw Boulevard at Exposition Boulevard looking southeast.

Proposed

Crenshaw/Exposition Station at the southeast corner of the Crenshaw/Exposition Boulevards intersection would result in the removal of commercial buildings but would not adversely affect the visual character of the area..

Source: Anil Verma, 2011.

Because the alignment would travel below grade along this segment, visual effects would be limited to the station portal areas, which will be designed to be consistent with the surrounding environment. No adverse effects related to visual quality would occur along this portion of the alignment.

The MOSs are shorter route segments that have the same effects as described for the LPA. The terminal stations at King or Century would have the same design as the LPA and no adverse effects related to visual quality would occur with implementation of Mitigation Measures **V1** through **V5**.

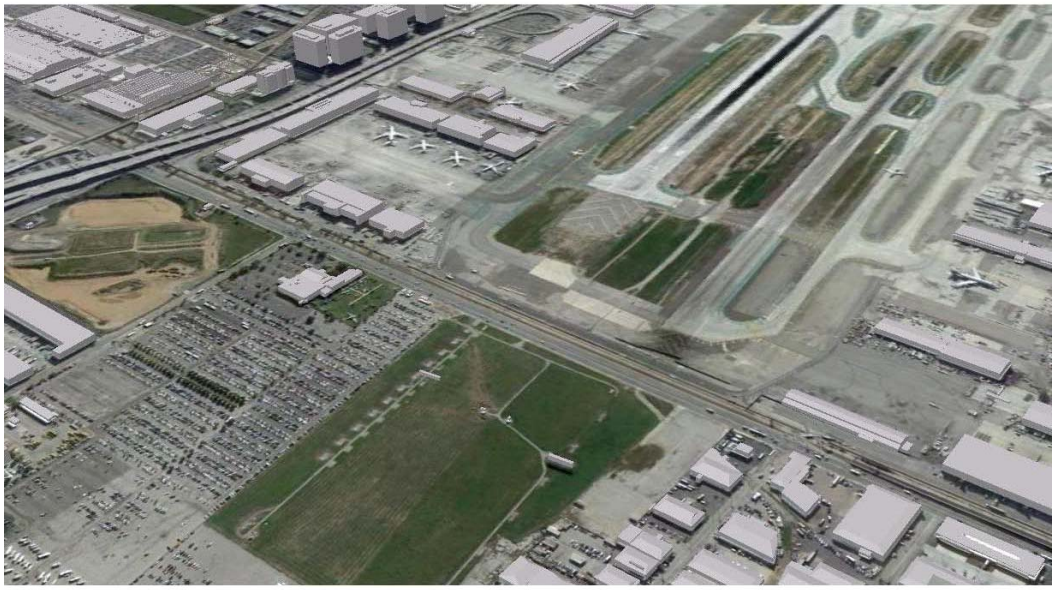
Design Options

Partially-Covered LAX Trench Option. There is an interim design option for the below-grade trench to be fully covered in front of the direct line of the LAX runway and partially covered as the alignment extends away from the runway (Exhibit N). The full buildout of a fully covered trench will be deferred to a future date when funding is identified to support the additional covered segments. LRT headlights and car lighting of trains within the partially covered trench section would be less visible to approaching aircraft than existing headlights of trucks, cars and buses (including the interior lighting of the latter) that currently operate on Aviation Boulevard directly adjacent to the Metro ROW. The proposed covered sections of this option would further cover any light from trains along the runway centerline extended and approximately 250 feet north and south of the centerline extended. Therefore, the angle of indirect light from the LRT trains would not result in an increase in ambient lighting which could affect approaching planes. As the partially-covered segment would be below ground, it would not be visible from street level and would not substantially alter the visual character of the area. No adverse visual effects would occur under this option.

Below-Grade Crossing at Centinela Option. The Below-Grade Crossing at Centinela Option would be located nearby residential uses, as well as area landmarks including Edward Vincent Jr. Park, St. John Chrysostom Church, and Inglewood Park Cemetery (Exhibit O). The trench would be covered at Centinela. However, it would be open to the east and west of this location. The open trench design would not be clearly visible from Florence Boulevard or other vantage points to the south, such as from the Inglewood Park Cemetery or St. John Chrysostom Church. Due to topography, it is expected that the cut and fill along the southern hillside would be visible from locations to the north and within Edward Vincent Jr. Park. This would be a discernible change and would result in an adverse visual effect. In addition, this design option would require removal of more landmark palm trees south of the Harbor Subdivision, adjacent to the Florence Avenue/Centinela Avenue intersection than the LPA. This would be considered an adverse visual change. Lastly, the trench design would remove screening landscaping west of Centinela Avenue, adjacent to La Colina Drive. These visual changes would also be considered to be adverse. With the implementation of Mitigation Measure **V2** and **V5**, no adverse effects are anticipated related to visual quality.

Exhibit N. Partially-Covered LAX Trench Option

Existing



Existing view of Aviation Boulevard in front of the LAX south runways.

Proposed

The Partially-Covered LAX Trench Option (interim solution) would be covered directly in front of the runways and have open sections in the middle and on the ends. The partially-covered segment would be below ground, would not be visible from street level, and would not substantially alter the visual character of the area. No adverse visual effects would occur.

Exhibit O. Below-Grade Crossing at Centinela Option

Existing

Existing Centinela Avenue/Florence Avenue intersection

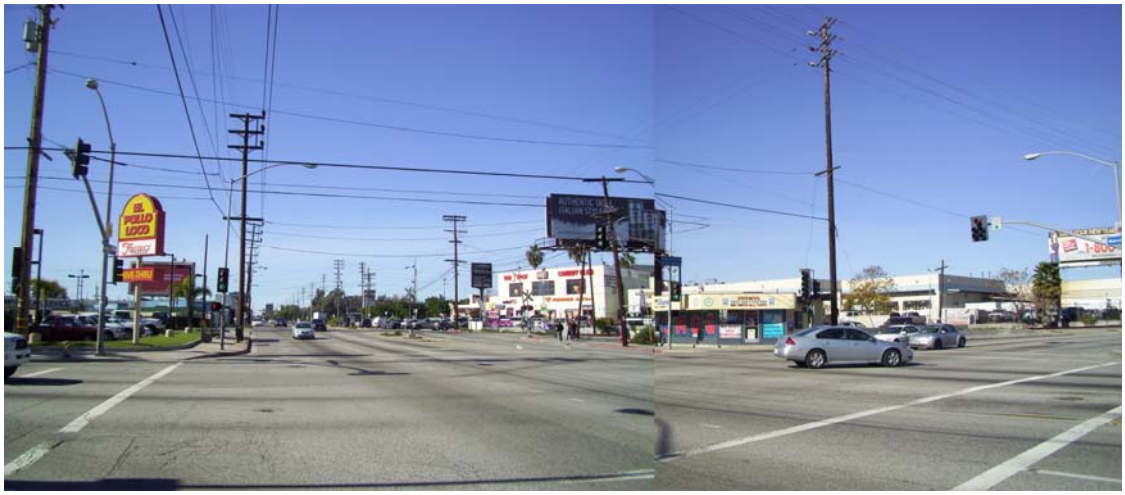
Proposed

Rendering of Cut-and-Cover Crossing at Centinela. The trench design would remove screening landscaping west of Centinela Avenue, adjacent to La Colina Drive. These visual changes would also be considered to be adverse without mitigation.

Optional Aviation/Manchester Station. The Optional Aviation/Manchester Station would either be located along a modified aerial crossing at Manchester Avenue or where the alignment returns to grade to the north adjacent to the Edison substation (Exhibit P). Visual effects related to this option would be similar to those of the LPA aerial structure at this location, which would be consistent with the context of the surrounding area. Although a station at Manchester Avenue would create an additional visual element to the aerial structure, it would be similar in character to structures in the area and would not result in adverse effects related to visual quality.

Exhibit P. Optional Aviation/Manchester Station

Existing



Existing Aviation/Manchester intersection.

Proposed

Rendering of Optional Aviation/Manchester Station. The station at Manchester Avenue would create an additional visual element to the aerial structure, but would be similar in character to structures in the area and would not result in adverse effects.

Optional Below-Grade Crenshaw/Vernon Station. The Below-Grade Crenshaw/Vernon Station Option would be located within the Leimert Park triangle surrounded by Crenshaw Boulevard, Leimert Boulevard and Vernon Avenue (Exhibit Q). This station would have limited operational effects as the area is primarily commercial in use.

Exhibit Q. Optional Below-Grade Crenshaw/Vernon Station
Existing

Existing Crenshaw Boulevard at Vernon Avenue (Leimert Park Triangle).

Proposed

Rendering of Crenshaw/Vernon Station. The portal would be consistent with the character of the existing environment and would not result in adverse effects.

The station would not reduce light on the street, cast shadows on adjacent land uses, or reduce the openness and overall character of Crenshaw Boulevard. In addition, the station would not have an effect on visual resources and would represent a negligible addition to light and glare as the station would be located adjacent to a roadway right-of-way, which currently produces transportation related light and glare. The station would not affect the Leimert Park open space area on the east side of Crenshaw Boulevard. The below-grade station north of Vernon Avenue would be consistent with the character of the existing environment and would not result in adverse effects related to visual quality.

Alternate Southwest Portal at Crenshaw/King Station Option. A station portal at the southwest corner of the Crenshaw/Martin Luther King Jr. Boulevard intersection would be located along landscaped frontage adjacent to the historic Broadway Department Store building (currently Wal-Mart). Mitigation Measure **V6** would ensure that the portal structure would be designed so as not to obstruct or contrast with the features of the building and would not remove or obstruct existing uses (Exhibit R). Therefore, no adverse effects are anticipated related to visual quality for this design option.

4.4.3 Mitigation Measures

V1 To minimize visual clutter, integrate system components, and reduce the potential for conflicts between the transit system and adjacent communities, design of the system stations and components shall follow the recommendations and principles developed in the project urban design explorations to the extent feasible. These principles include, but are not limited to: 1) preserve and enhance the unique cultural identity of each station area and its surrounding community by implementing art and landscaping; and 2) promote a sense of place, safety, and walkability by providing street trees, walkways or sidewalks, lighting, awnings, public art, and/or street furniture. Prior to final design, community input shall also be used to help achieve these guidelines.

V2 At locations where existing land uses or vegetation is removed and neighboring residential or sensitive uses are exposed to new views of the transit system, additional landscaping shall be provided within the right-of-way or in remnant acquisition parcels where practical to create a buffer between the uses, but not necessarily to completely screen uses. Community input from adjacent residences or sensitive land uses shall be incorporated to the greatest extent feasible on the landscaping design elements to be incorporated.

V3 Mature trees that are removed during construction of the Crenshaw/LAX Transit Corridor Project shall be relocated or replaced with a tree of similar species, or if inappropriate for climate conditions, a species that is low-water use and compliant with the applicable City's landscape ordinance. Replacement should occur in consultation with the Los Angeles Bureau of Street Services Street Tree Division and with the City of Inglewood Department of Public Works.

Exhibit R. Alternate Southwest Portal at Crenshaw/King Station Option

Existing

Crenshaw Boulevard south of Martin Luther King Jr. Boulevard, looking north.

Proposed

Rendering of Crenshaw/King Station southwest portal option, looking north on Crenshaw Boulevard at Martin Luther King Jr. Boulevard. This portal would be designed to visually compliment the historic Broadway building and would not result in adverse visual effects.

Source: RAW International, 2011.

V4 Where practical and appropriate, additional landscaping and enhanced design features will be used to minimize the visual image of the TPSS sites and other ancillary facilities.

V5 For the Centinela Avenue Below-Grade Crossing design option, screening that is consistent with the existing area and Edward Vincent Jr. Park shall be installed on the north side of the trench to the extent feasible to reduce the adverse effects on the south-facing view of the trench.

V6 Should the alternate southwest portal at the Crenshaw/King Station be selected, the structure for the portal will be designed to complement the Streamline Moderne style of the Broadway Department Store consistent with the Secretary of Interior standards.

4.4.4 CEQA Determination

The CEQA determination compares the effects of the proposed project, design options and MOSs with the existing conditions described in the affected environment/existing conditions section. According to CEQA, the Crenshaw/LAX Transit Corridor Project would result in a significant impact to visual resources if it would:

- Adversely affect a scenic resource;
- Substantially damage a scenic resource, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- Substantially degrade the existing visual character or quality of the site and its surroundings; and/or
- Create a new source of light or glare which would adversely affect day or nighttime views in the area.

4.4.4.1 No-Build Alternative

There would be no impacts to scenic resources or increases in light and glare. However, the No-Build Alternative would not address the projected future increased congestion within the corridor. The increased congestion, without appropriate development of infrastructure, could substantially degrade the existing visual character or quality within the project corridor.

4.4.4.2 LPA

The LPA would have similar effects under CEQA as previously described under the NEPA discussion and would result in significant impacts to visual resources. Implementation of Mitigation Measures **V1** through **V5** would reduce impacts to visual resources to less than significant.

Design Options

The LPA would have similar impacts under CEQA as previously described under the NEPA discussion and would result in less-than-significant impacts with the incorporation of Mitigation Measures **V1** through **V6**.

MOSs

The MOSs would result in shorter segments that have the same effects as described for the LPA and less-than-significant impacts related to visual quality would occur with implementation of Mitigation Measures **V1** through **V5**.

4.4.4.3 Impacts Remaining after Mitigation

Implementation of Mitigation Measures **V1** through **V5**, would help to reduce the effects of vegetation removal and land acquisition. With implementation of mitigation measures **V1** through **V6**, impacts to visual resources of the LPA, design options, and MOSs would be less than significant.

4.5 Air Quality

This section examines the affected environment related to air quality. The existing air quality conditions are addressed within the project corridor, as well as potential impacts resulting from the project alternatives, design options, and operations and maintenance facility sites.

4.5.1 Existing Conditions/Affected Environment

Air Quality Conditions

The study area is located within the Los Angeles County portion of the South Coast Air Basin (SCAB). The South Coast Air Quality Management District (SCAQMD) monitors air quality conditions at 38 locations throughout SCAB. The Los Angeles-North Main Street monitoring station is located 6.7 miles northeast of the northern boundary of the study area at 1630 North Main Street within the Central Los Angeles Source Receptor Area. The LAX-Hastings monitoring station is located in the southwest portion of the study area at 7201 West Westchester Parkway in the Southwest Coastal Source Receptor Area. The air monitoring stations near the alignment have recently recorded exceedances of ozone (O_3), particulate matter 2.5 microns or less in diameter ($PM_{2.5}$), and particulate matter 10 microns or less is diameter (PM_{10}) standards.

As required by the federal Clean Air Act Amendments (CAAA), National Ambient Air Quality Standards (NAAQS) have been established for seven major air pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), O_3, $PM_{2.5}$, PM_{10}, sulfur dioxide (SO_2), and lead (Pb). The CAAA requires U.S. Environmental Protection Agency (USEPA) to designate areas as attainment, nonattainment, or maintenance (previously nonattainment and currently attainment) for each criteria pollutant based on whether the NAAQS have been achieved. The USEPA has classified SCAB as maintenance for CO and nonattainment for O_3, $PM_{2.5}$, and PM_{10}.

Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. The following groups are considered sensitive to changes in air quality: children under 14, the elderly over 65 years of age, athletes, and people with cardiovascular and chronic respiratory diseases. According to the SCAQMD, sensitive receptors include residences, schools, playgrounds, child care centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes.

4.5.2 Environmental Impacts/Environmental Consequences

Operational emissions were based on vehicle miles traveled. Automobile emissions factors were obtained from the California Air Resources Board (CARB) EMFAC2007 model. EMFAC2007 is the latest emission inventory model that calculates emission inventories and emission rates for motor vehicles operating on roads in California. This model reflects the CARB's current understanding of how vehicles travel and how much they pollute. The EMFAC2007 model can be used to show how California motor vehicle

emissions have changed over time and are projected to change in the future. Compressed natural gas (CNG) bus emission factors were obtained from a list of the CARB's approved CNG engines. Emissions associated with light rail electricity use were based on an electricity usage rate provided by Metro. LPA emissions were compared to baseline, or No-Build Alternative, emissions to quantify decreases or increases in air emissions. The significance of regional operational emissions was determined based on allowable emission rates under the General Conformity Regulations.

Localized CO concentrations were calculated utilizing the USEPA's CAL3QHC dispersion model and the CARB's EMFAC2007 model. CAL3QHC is a model developed by the USEPA to predict CO and other pollutant concentrations from motor vehicles at roadway intersections. The significance of CO concentrations was determined based on the NAAQS. The model uses a traffic algorithm for estimating vehicular queue lengths at signalized intersections. Greenhouse gas (GHG) emissions were also calculated using emission rates from EMFAC2007 and the CARB.

According to 40 *Code of Federal Regulations* (CFR) Part 93.102, conformity determinations are required for projects that require the approval, funding, or implementation of federally funded projects. The proposed project would be required to comply with USEPA Transportation Conformity Rule (40 CFR Part 93). The conformity decision is based upon guidance contained in the USEPA's *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* (March 2006).

4.5.2.1 Regional Operational Emissions

No-Build Alternative

The No-Build Alternative would not result in new operational activity and would not have an adverse regional operational air quality impact.

LPA

The regional emissions shown in Table 4-10 are compared to the federal thresholds for air quality conformity assessment. The LPA would decrease mobile source emissions when compared to baseline (No-Build Alternative) conditions by 2 tons per year (tpy) for reactive organic gases (ROG), 61 tpy for CO, less than 1 tpy for PM_{10}. Nitrogen oxide (NO_X) emissions associated with the LPA would increase by 2 tpy but would not exceed the federal threshold. The increase in NO_X emissions would occur because vehicle miles traveled (VMT) by the LRT would produce approximately 7tpy of NO_X and the auto-related emissions would only be reduced by approximately 5 tpy based on VMT data. The LPA would not result in an adverse regional operational air quality impact. The emission estimations presented above differ from those presented in the DEIS/DEIR because of design refinements to the transportation modeling analysis.

The MOSs would result in shorter segments and would not directly connect to the Expo or Green Lines. Compared to the LPA, the shorter segments would result in 35 percent fewer passenger boardings. The MOSs would decrease mobile source emissions when compared to the No-Build Alternative by less 1 tpy for ROG, 39 tpy for CO, less than 1 tpy

Table 4-10. Regional Operational Emissions - NEPA

Scenario	Net Tons Per Year			
	ROG	NO_x	CO	PM_{10}
LPA vs. No-Build Alternative	-2	2	-61	<1
Significance Thresholds	10	10	100	70
Exceed Threshold?	No	No	No	No

Source: TAHA, 2011.

for PM_{10}. NO_x emissions associated with the LPA would increase by 3 tpy but would not exceed the federal threshold. Similar to the LPA, the MOSs would not result in an adverse regional operational air quality impact.

Design Options

Partially-Covered LAX Trench Option. The Partially-Covered LAX Trench Option would neither increase nor decrease the estimated LPA emissions as it would not affect the ridership or regional VMT.

Below-Grade Crossing at Centinela. The Below-Grade Crossing at Centinela Option would neither increase nor decrease the estimated LPA emissions as it would not affect the ridership or regional VMT.

Optional Aviation/Manchester Station. The Optional Aviation/Manchester Station would result in increased ridership when compared to the LPA. This would result in less VMT and associated regional operational emissions than the LPA. Similar to the LPA, Optional Aviation/Manchester Station would not result in an adverse regional operational air quality impact.

Optional Below-Grade Crenshaw/Vernon Station. The Below-Grade Crenshaw/Vernon Station Option would result in increased ridership when compared to the LPA. This would result in less VMT and associated regional operational emissions than the LPA. Similar to the LPA, the Below-Grade Crenshaw/Vernon Station Option would not result in an adverse regional operational air quality impact.

Alternate Southwest Portal at Crenshaw/King Station. A station portal at the southwest corner of the Crenshaw/Martin Luther King Jr. Boulevard intersection would neither increase nor decrease the estimated LPA emissions as it would not affect the ridership or regional VMT.

4.5.2.2 Localized Carbon Monoxide Hotspots

CO concentrations in 2030 are expected to be lower than existing conditions due to stringent State and federal mandates for lowering vehicle emissions. Although traffic volumes would be higher in the future both without and with the implementation of the proposed project, CO emissions from mobile sources are expected to be much lower due to technological advances in vehicle emissions systems, as well as from normal turnover

in the vehicle fleet. Accordingly, increases in traffic volumes would be offset by increases in cleaner-running cars as a percentage of the entire vehicle fleet on the road.

The federal one- and eight-hour CO standards may be exceeded at congested intersections with high traffic volumes. A representative sample of intersections was selected based on congested conditions with high traffic volumes. The selected intersections are as follows:

- Aviation Boulevard/Century Boulevard - AM Peak Hour
- Crenshaw Boulevard/Adams Boulevard - AM Peak Hour
- Crenshaw Boulevard/Jefferson Boulevard - PM Peak Hour
- Crenshaw Boulevard/Slauson Avenue - AM Peak Hour
- Crenshaw Boulevard/Stocker Street - PM Peak Hour
- Crenshaw Boulevard/Washington Boulevard - AM Peak Hour
- La Brea Avenue/Jefferson Boulevard - PM Peak Hour
- La Brea Avenue/Rodeo Road - PM Peak Hour
- La Brea Avenue/Slauson Avenue - PM Peak Hour
- Wilton Place/Wilshire Boulevard - AM Peak Hour

The USEPA CAL3QHC micro-scale dispersion model was used to calculate CO concentrations for 2030 conditions. Table 4-11 displays the CO concentrations associated with existing conditions and the LPA.

Table 4-11. 2030 Carbon Monoxide Concentrations /a/

Intersection	1-Hour (Parts per Million)		8-Hour (Parts per Million)	
	Existing (2008)	LPA Project Year (2030)	Existing (2008)	LPA Project Year (2030)
Aviation Blvd/Century Blvd - AM Peak Hour	5	2	3.8	1.4
Crenshaw Blvd/Adams Blvd - AM Peak Hour	5	2	3.9	1.4
Crenshaw Blvd/Jefferson Blvd - PM Peak Hour	5	2	3.9	1.3
Crenshaw Blvd/Slauson Ave - AM Peak Hour	5	2	3.8	1.3
Crenshaw Blvd/Stocker St - PM Peak Hour	5	2	3.9	1.4
Crenshaw Blvd/Washington Blvd - AM Peak Hour	5	2	3.8	1.4
La Brea Ave/Jefferson Blvd - PM Peak Hour	5	2	3.6	1.2
La Brea Ave/Rodeo Rd - PM Peak Hour	5	2	3.9	1.4
La Brea Ave/Slauson Ave - PM Peak Hour	5	2	3.9	1.4
Wilton Pl/Wilshire Blvd - AM Peak Hour	5	2	3.9	1.4

/a/ Existing concentrations include year 2008 one- and eight-hour background concentrations of 4 and 3.1 ppm, respectively. Future concentrations include year 2030 one- and eight-hour background concentrations of 1.36 and 1.1 ppm, respectively.
Source: TAHA, 2008.

No-Build Alternative

This alternative would not result in new operational activity and would not have an adverse localized operational air quality impact.

LPA

Under the LPA, one-hour CO concentrations would be approximately 2 parts per million (ppm) at worst-case sidewalk receptors. Eight-hour CO concentrations would range from approximately 1.2 to 1.4 ppm. The federal one- and eight-hour standards of 35 and 9 ppm, respectively, would not be exceeded at the study intersections. The LPA would not result in an adverse localized carbon monoxide impact.

The MOSs would not substantially alter the peak hour turn volumes that were used to estimate the localized CO concentrations for the LPA. Similar to the LPA, the MOSs would not result in an adverse localized carbon monoxide impact.

Design Options

The design options would not substantially alter the peak hour turn volumes that were used to estimate the localized CO concentrations for the LPA. Similar to the LPA, the design options would not result in an adverse localized carbon monoxide impact.

4.5.2.3 Toxic Air Contaminants

No-Build Alternative

This alternative would not result in new operational activity and would not have an adverse toxic air contaminant (TAC) impact.

LPA

The LPA would reduce regional VMT and associated mobile source air toxics (MSAT). The light rail would be electrically powered and would not emit diesel particulate matter. The LPA would not result in an adverse TAC impact.

As with the LPA, the MOSs that are shorter alignments would not generate new sources of MSAT emissions, including diesel particulate matter. Similar to the LPA, the MOSs would not result in an adverse MSAT impacts.

Design Options

The design options would not generate new sources of MSAT emissions, including diesel particulate matter. Similar to the LPA, the design options would not result in an adverse MSAT impacts.

4.5.2.4 Odors

No-Build Alternative

This alternative would not result in new operational activity and would not have an adverse odor impact.

LPA

Land uses and industrial operations that are associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies and fiberglass molding. The LPA would not include land use or activity that typically generates adverse odors and would not result in an adverse odor impact.

Similar to the LPA, the MOSs would not include uses or activities which would generate odors, and would not result in adverse odor impacts.

Design Options

Similar to the LPA, the design options would not include uses or activities which would generate odors, and would not result in adverse odor impacts.

4.5.2.5 Transportation Conformity

Transportation conformity is required under Clean Air Act (CAA) section 176(c) (42 *United States Code* (USC) 7506(c)) to ensure that federally supported highway and transit project activities are consistent with the purpose of the State Implementation Plan (SIP). Conformity to the purpose of the SIP means that transportation activities will not cause new air quality violations, worsen existing violations, or delay timely attainment of the relevant NAAQS. USEPA's transportation conformity rule (40 CFR 51.390 and Part 93) establishes the criteria and procedures for determining whether transportation activities conform to the SIP. Under the criteria, transportation projects must demonstrate conformity on regional and local levels.

Regional Conformity

Measure R funding is available for the proposed project and is in the 2008 Regional Transportation Plan which was found to conform by the Southern California Association of Governments on May 8, 2008, and FHWA and Federal Transit Administration (FTA) adopted the air quality conformity finding on June 5, 2008. The project is also included in the Southern California Association of Governments financially constrained 2008 Regional Transportation Improvement Program. The Southern California Association of Governments Regional Transportation Improvement Program was found to conform by FHWA and FTA on July 17, 2008. The design concept and scope of the proposed project is consistent with the project description in the 2008 RTP, the 2008 *Regional Transportation Improvement Program* (RTIP) and the assumptions in the SCAG's regional emissions analysis.

Project Conformity

Carbon Monoxide Hotspot Analysis. The California Project-Level Carbon Monoxide Protocol (CO Protocol) was used to conduct a CO analysis for the proposed project. The quantitative analysis shown in Table 4-11 indicates that the LPA would not result in a CO hot spot. Therefore, the proposed project will not have the potential for causing or worsening violation of the National Ambient Air Quality Standards for CO.

$PM_{2.5}$/PM_{10} Hotspot Analyses. Qualitative particulate matter hotspot analysis is required under the USEPA Transportation Conformity rule for Projects of Air Quality Concern (POAQC). Projects that are not POAQC are not required to complete a detailed particulate matter hotspot analysis. According to the USEPA Transportation Conformity Guidance, the following types of projects are considered POAQC:

- New or expanded highway projects that have a significant number of or significant increase in diesel vehicles (defined as greater than 125,000 Annual Average Daily Traffic (AADT) and eight percent or more of such AADT is diesel truck traffic);
- Projects affecting intersections that are at a Level of Service D, E, F, with a significant number of diesel vehicles, or that that will change to Level of Service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;
- New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;
- Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; or
- Projects in or affecting locations, areas, or categories of sites which are identified in the $PM_{2.5}$ or PM_{10} implementation plan or implementation plan submission, as appropriate, as sites of possible violation.

LPA

The LPA is not considered a POAQC because it does not meet the definition of a POAQC as defined in USEPA's Transportation Conformity Guidance. The proposed project would not increase the percentage of diesel vehicles on the roadway, does not involve a bus or rail terminal that significantly increases diesel vehicles, and is not identified in the SIP as a possible $PM_{2.5}$ or PM_{10} violation site. A particulate matter hotspot analysis is not required.

Neither of the MOSs, which are shorter alignments than the LPA, would affect the POAQC designation of the LPA. A particulate matter hotspot analysis is not required.

Design Options

None of the design options would affect the POAQC designation of the LPA. A particulate matter hotspot analysis is not required.

4.5.3 Mitigation Measures

No mitigation measures are required.

4.5.4 CEQA Determination

The above analysis demonstrated compliance with the National Environmental Quality Act. The following analysis demonstrates compliance with the California Environmental Quality Act. The analysis is based on guidance provided by the SCAQMD. The CEQA determination compares the effects of the proposed project, design options and MOSs with the existing conditions described in the affected environment/existing conditions section. In

accordance with Appendix G of the State CEQA Guidelines, the proposed project would have a significant impact related to air quality if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Expose sensitive receptors to substantial pollutant concentrations; and/or
- Create objectionable odors affecting a substantial number of people.
- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; and/or
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

No-Build Alternative

This alternative would not result in new operational activity. Regional emissions, localized CO concentrations, TACs, odors, and GHG emissions would result in less-than-significant impacts.

LPA

The regional emissions shown in Table 4-12 shows regional emissions for two scenarios: Existing Conditions compared to Existing with LPA Conditions and LPA (Year 2030) Conditions compared to No-Build Conditions (Year 2030). The level of significance is determined using thresholds established by the South Coast Air Quality Management District. The LPA would increase mobile source emissions when compared to the No-Build Alternative by 12 pounds per day for NO_X.

Table 4-12. Regional Operational Emissions - CEQA

Scenario	Net Pounds per Day				
	ROG	NO_X	CO	$PM_{2.5}$	PM_{10}
LPA vs. No-Build Alternative	-11	12	-337	-1	-3
Significance Thresholds	55	55	550	55	150
Exceed Threshold?	No	No	No	No	No
Existing with LPA vs. Existing	-1	34	-42	2	2
Significance Thresholds	55	55	550	55	150
Exceed Threshold?	No	No	No	No	No

Source: TAHA, 2011.

The LPA would decrease mobile source emissions for all other analyzed pollutants. NO_X emissions associated with the LPA would increase by 12 tpy but would not exceed the SCAQMD threshold. The increase in NO_X emissions would occur because VMT by the LRT would produce approximately 38 pounds per day of NO_X from the production of electricity and the auto-related emissions (i.e., automobiles and buses) would only be reduced by

approximately 26 pounds per day based on VMT data. Table 4-12 also shows that compared to the existing emissions, the addition of project emissions would also not exceed the SCAQMD significance thresholds. The LPA would result in a less-than-significant regional emissions impact. The emission estimations presented above differ from those presented in the DEIS/DEIR because of design refinements to the transportation modeling analysis.

As shown in Table 4-11, existing one-hour CO concentrations are approximately 20 ppm and existing eight-hour concentrations are approximately 3.9 ppm. These concentrations are 25 percent below the State one-hour standard and 43 percent below the State eight-hour standard. A screening analysis using CALINE4 indicated that, under existing conditions, roadway segment volumes would need to increase by approximately 7,500 vehicles in one hour to increase CO concentrations by 1.0 ppm. This concentration would still be well below the State standards. The LPA would not increase existing peak hour vehicles volumes by more than 250 cars at any intersection. Therefore, the existing plus project conditions would not result in an adverse localized carbon monoxide impact.

The largest source of greenhouse gas emissions is automobile travel. Public transportation projects generally reduce the amount of cars driving on the road, by providing the public with alternative means of transportation. Fewer cars on the road leads to less sources of pollution. Because of the higher capacity of LRT, rail vehicles are able to transport higher quantities of people while producing fewer emissions than the cars they are replacing. This results in a reduction in greenhouse gas emissions. GHG emissions were modeled using EMFAC2007 for automobiles and electricity emission factors obtained from the CalEEMod model. As shown in Table 4-13, the LPA would decrease automobile VMT and associated GHG emissions compared to baseline conditions by 19,741 metric tons per year. This estimation includes connections to unconstructed portions of the future Metro transit system such as the Expo lines. The LPA would reduce regional emissions and, as such, would be consistent with regional greenhouse reduction plans (e.g., California Senate Bill [SB] 375). As discussed in Section 4.1, Land Use and Development, new stations could potentially lead to transit oriented development along the alignment. Transit oriented development could encourage the use of the light rail system. Therefore, the LPA would result in beneficial effects related to GHGs.

The purpose of the LPA is to address long-term transportation concerns. Because the future without project conditions will not preserve the existing physical conditions, it is not necessary to compare existing to LPA emissions to determine impacts and significance over time. However, for informational purposes, Table 4-13 compares existing emissions to existing with project emissions. Existing with project conditions would result in 8,936 metric tons more of GHG emissions when compared to existing conditions. The hypothetical existing with project scenario would remove 141,535 fewer vehicle miles traveled from the roadway system than the future with project scenario because the existing with project scenario would not be connected to the other portions of the Metro transit system. In the future, the LPA would be connected to the Exposition Light Rail Line. However, the Exposition Light Rail Line does not exist in the existing with project scenario. This results in less ridership and associated VMT reduction. Regardless, GHG emissions under this hypothetical scenario would be less than the

Table 4-13. Estimated GHG Emissions

Source	Change in Carbon Dioxide Equivalent (Net Metric Tons per Year) /a/
Project vs. No-Build Alternative (Future with Project and Future without Project)	
Operations	-21,045
Construction /a/	1,304
Total	-19,741
Significance Threshold	10,000
Exceed Threshold?	No
Existing with Project vs. Existing without Project	
Operations	7,632
Construction /a/	1,304
Total	8,936
Significance Threshold	10,000
Exceed Threshold?	No

/a/Based on SCAQMD guidance, construction emissions are amortized over a 30-year period to represent annual emissions

Source: TAHA, 2011.

established threshold. Existing with project emissions would result in a less-than-significant impact.

In summary, the LPA would decrease GHG emissions when compared to the No-Build Alternative. However, the hypothetical existing with project scenario would increase GHG emissions when compared to existing without project conditions.

As discussed in Section 4.1, Land Use and Development, new stations would potentially lead to transit oriented development along the alignment. Transit oriented development would encourage the use of the light rail system.

The MOSs would result in shorter segments and MOS-King would not directly connect to the Metro Exposition Line and MOS-Century would not directly connect to the Metro Green Line. Although when compared to the LPA, the shorter MOS segments would result in 35 percent fewer passenger boardings, and the MOSs would decrease mobile source emissions for all pollutants except NO_X. NO_X emissions associated with the MOSs would increase by 17 pounds per day (5 pounds per day more than the LPA) in year 2030 and 34 pounds per day (22 pounds per day more than the LPA). These emissions would not exceed the SCAQMD threshold. The MOSs would result in a less-than-significant regional emissions impact.

Design Options

Partially-Covered LAX Trench Option. The Partially-Covered LAX Trench Option would neither increase nor decrease the estimated LPA emissions as it would not affect the ridership or regional VMT.

Below-Grade Crossing at Centinela. The Below-Grade Crossing at Centinela Option would neither increase nor decrease the estimated LPA emissions.

Optional Aviation/Manchester Station. The Optional Aviation/Manchester Station would result in increased ridership when compared to the LPA. This would result in less VMT and associated regional operational emissions than the LPA. Similar to the LPA, Optional Aviation/Manchester Station would result in a less-than-significant regional operational air quality impact.

Optional Below-Grade Crenshaw/Vernon Station. The Below-Grade Crenshaw/Vernon Station Option would result in increased ridership when compared to the LPA. This would result in less VMT and associated regional operational emissions than the LPA. Similar to the LPA, the Below-Grade Crenshaw/Vernon Station Option would result in a less-than-significant regional operational air quality impact.

Alternate Southwest Portal at Crenshaw/King Station. A station portal at the southwest corner of the Crenshaw/Martin Luther King Jr. Boulevard intersection would neither increase nor decrease the estimated LPA emissions.

4.5.5 Impacts Remaining After Mitigation

Impacts would be less than significant and no mitigation measures are required.

4.6 Noise and Vibration

4.6.1 Existing Conditions/Affected Environment

FTA has developed standards and criteria for assessing noise impacts related to transit projects. These standards, outlined in Transit Noise and Vibration Impact Assessment (FTA, 2006), are based on community reactions to noise. Appendix F provides definitions of noise and vibration levels used to evaluate impacts. The criteria reflect changes in noise exposure using a sliding scale where the higher the level of existing noise, the smaller increase in total noise exposure is allowed. Some land use activities are more sensitive to noise than others, such as parks, churches, and residences, as compared to industrial and commercial uses. Non-sensitive uses do not require noise impact assessment.

Prior to performing an analysis of the future noise and vibration levels, it is necessary to establish the existing baseline noise levels within the study area. This is accomplished by performing a series of measurements at representative noise-sensitive locations along the proposed alignments. The noise-sensitive land uses and noise measurement locations are shown in Figure 4-29 and Figure 4-30, and measured noise levels are presented in Table 4-14.

Table 4-14. Existing Noise Levels At Sensitive Uses

Monitoring Site I.D.	Site Description	FTA Land Use Category[1]	Measured L_{dn}[2] (dBA)	Measured L_{eq} (dBA)	Figure
Long-term (24-Hour) Noise Measurement Locations					
A	3954 ¼ Crenshaw Blvd	2	72	70	Figure 4-29
B	4808 Crenshaw Blvd	2	72	71	Figure 4-29
C	6203 Crenshaw Blvd	2	77	75	Figure 4-29
D	411 La Colina Dr	2	69	68	Figure 4-30
E	622 La Casa Villa West	2	68	71	Figure 4-30
F	Aviation Blvd and 98th St	2	74	75	Figure 4-30
Short-term (15-Minute) Noise Measurement Locations[3]					
1	6611 Crenshaw Blvd	2	73	72	Figure 4-29
2	Edward Vincent Jr. Park – Tennis Courts	1	NA	60	Figure 4-30
3	201 W Regent St	3	68	70	Figure 4-30
9	5300 82nd St	2	68	70	Figure 4-30

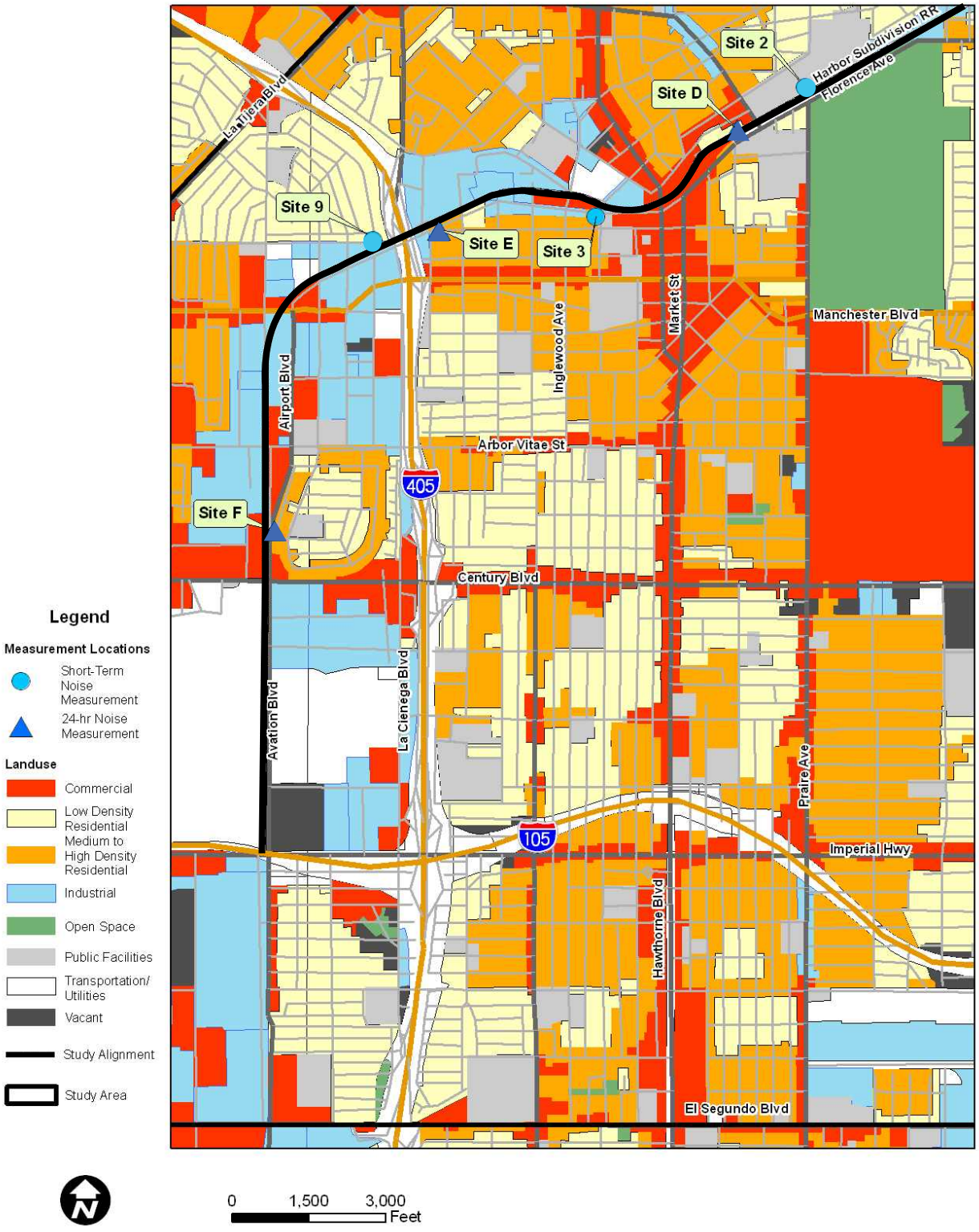
Source: Parsons Brinckerhoff, 2008

Notes: NA – These sites do not have sleep activity. L_{dn} existing noise levels are not applicable at these sites. Each 15-minute noise measurement is compared to the closest 24-hour measurement site at the same hour of the day. The 15-minute noise levels are then adjusted relative to the 24-hour levels in order to develop a peak L_{eq} and L_{dn} for each of the 15-minute measurement locations.

[1] Land use category descriptors: FTA Category 1 = Buildings or parks where quiet is an essential element of their purpose; FTA Category 2 = Residences and other buildings where people sleep, such as hotels, apartments and hospitals; FTA Category 3 = Institutional land uses with primarily daytime and evening use, including schools, libraries and churches.

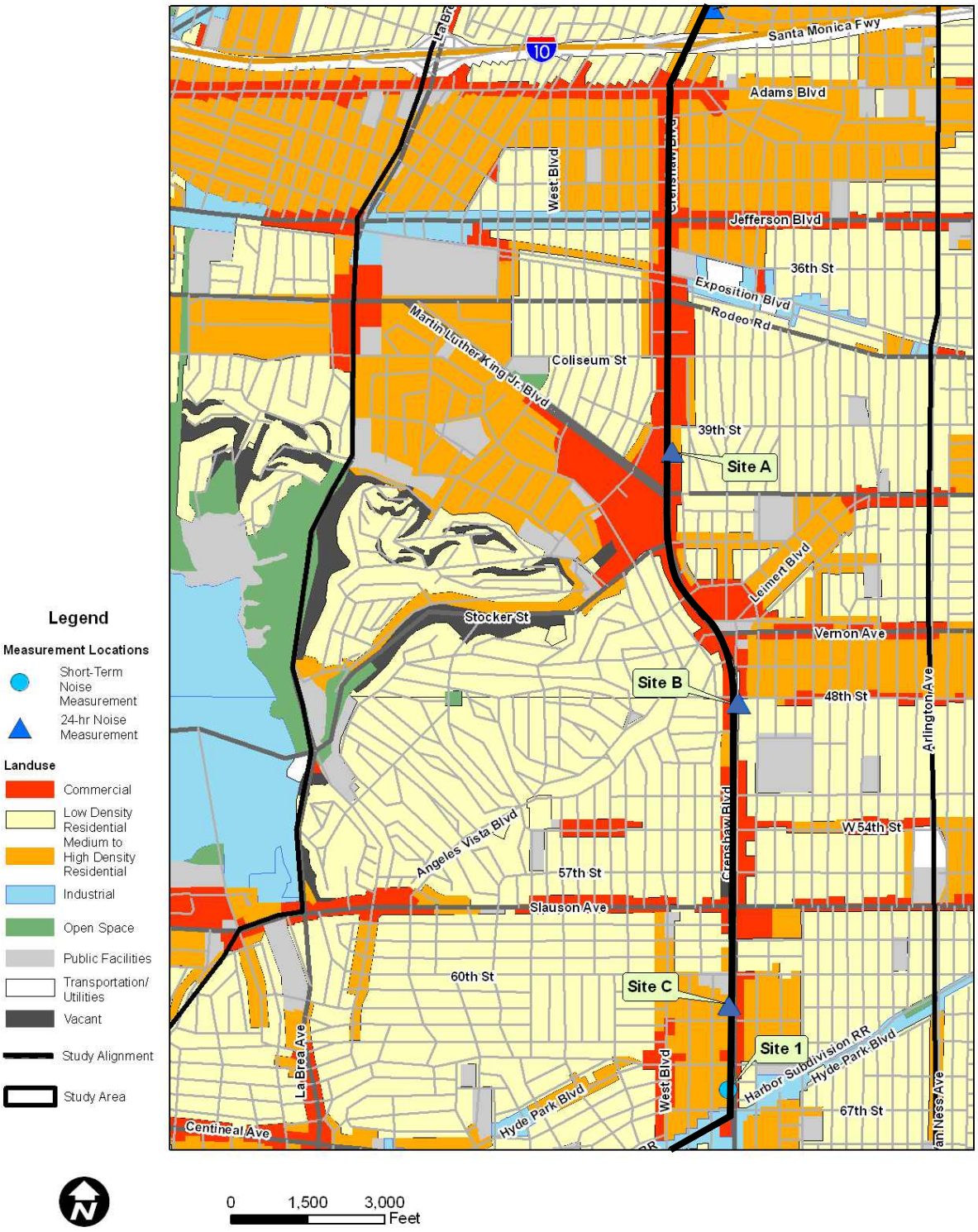
[2] L_{dn} is used for land uses with nighttime sensitivity to noise and for residential areas where FTA rather than FHWA noise procedures are applicable. Peak-hour L_{eq} is used for commercial, industrial, and other land uses that do not have nighttime noise sensitivity.

Figure 4-29. Interstate 105 –to the Harbor Subdivision Railroad Noise Sensitive Land Uses and Measurement Locations



Source: Parsons Brinckerhoff, 2008

Figure 4-30. Harbor Subdivision Railroad to Exposition Boulevard-Noise Sensitive Land Uses and Measurement Locations



Source: Parsons Brinckerhoff, 2008.

4.6.2 Environmental Impacts/Environmental Consequences

4.6.2.1 No-Build Alternative

The substantial source of future noise levels under the No-Build Alternative would be increased automobile traffic on local arterials. Changes in the automobile traffic are not expected to change the existing 24-hour (L_{dn}) noise levels along the segments. Peak-hour noise levels are not expected to increase because traffic in the area is already at or above road capacity. Under these conditions, traffic speeds would be significantly reduced and noise levels would be correspondingly low. Ground vibration levels from the increased number of rubber-tired vehicles would still be below the threshold of human perception because tires and shocks isolate vehicle vibrations from the roadway surface. Therefore, no noise and vibration impacts are anticipated for the No-Build Alternative.

4.6.2.2 LPA

Noise sources associated with the LPA include passby activity, special trackwork, wheel squeal, vent shafts, ancillary facilities, warning signals, and park and ride facilities. Below grade alignments would generate ground-borne noise and vibration.

Noise

Passby Activity

Table 4-15 displays anticipated project-related noise levels associated with LRT passby activity (when a train passes by a receptor). Receptors were identified based on the FTA screening guidance. The receptors shown in Figure 4-31 through 4-37 include land uses within 350 feet of the alignment with unobstructed views and land uses within 175 feet of the alignment with obstructed views. Figure 4-31 ends at Manchester Boulevard and Figure 4-32 begins at Hindry Avenue. This is because there are no sensitive receptors along the alignment between Manchester Avenue and Hindry Avenue. Where the alignment is below grade, airborne noise levels from train operations would not be audible. Potential noise impacts at each location have been identified as: no impact, moderate impact, or severe impact, in accordance with FTA Noise Impact Criteria. The noise analysis reflects the most recent design information for the project. As a result, the number of noise impacted buildings is different than previously presented in the DEIS/DEIR because of design changes. Table 4-15 provides a summary of the noise impacts. Moderate impacts would occur at 15 residential buildings (14 along La Colina Drive and one residence along East Beach Avenue). A moderate impact would also occur at the Briercrest Inglewood Healthcare Center. Therefore, adverse effects are expected without mitigation at these locations.

Table 4-15. LPA Noise Levels and Impacts

Receptor ID	Street that Alignment Follows	Type of Building	Monitoring Site I.D.	Number of Buildings	FTA Noise Category[1]	Train Speed (mph)	Distance of Trackwork to Receiver (Feet)	Existing Noise Level[2] (dBA)	Project Generated Noise (dBA)	Moderate Impact	Severe Impact	FTA Impact
1	Aviation	5447 Century – Residential	F	1	2	35	123	75	60	66-73	>73	No Impact
2	Aviation	5524 98th – Residential	F	1	2	35	123	75	60	66-73	>73	No Impact
3	Aviation	9706, 9712, 9720 Aviation – Residential	F	3	2	35	240	74	52	66-72	>72	No Impact
4	Aviation	Merle Norman Building	F	1	3	35	88	75	56	71-78	>78	No Impact
5	Aviation	Crimson Technical College	F	1	3	35	60	75	58	71-78	>78	No Impact
6	Florence	Westchester Playhouse	9	1	3	35	335	70	47	70-74	>74	No Impact
7	Florence	7862 Midfield – Residential	9	1	2	35	150	68	54	63-68	>68	No Impact
8	Florence	Stilleto Entertainment	9	1	1	35	160	70	59	65-69	>69	No Impact
9	Florence	129 Ash – Residential	E	1	3	35	136	68	55	68-73	>73	No Impact
10	Florence	619 Regent – Residential	E	1	2	35	120	68	56	63-68	>68	No Impact
11	Florence	Faithful Central Bible Church	E	1	3	35	72	71	57	71-75	>75	No Impact
12	Florence	Courthouse	D	1	3	55	83	68	60	68-73	>73	No Impact
13	Florence	333 – 423 La Colina, 338 Beach – Residential	D	15	2	55	64	69	64	64-69	>69	**Moderate**
14	Florence	Briercrest Inglewood Healthcare Center	D	1	2	55	72	68	63	63-68	>68	**Moderate**
15	Florence	St. John's Chrystostom Church and School	D	1	3	55	200	68	54	68-73	>73	No Impact
16	Florence	600 Florence – Residential	D	1	2	55	192	69	57	64-69	>69	No Impact
17	Florence	612 Florence – Residential	D	1	2	55	220	69	56	64-69	>69	No Impact
18	Florence	608, 618 Florence – Residential	D	2	2	55	200	69	57	64-69	>69	No Impact

Table 4-15. LPA Noise Levels and Impacts (continued)

Receptor ID	Street that Alignment Follows	Type of Building	Monitoring Site I.D.	Number of Buildings	FTA Noise Category1	Train Speed (mph)	Distance of Trackwork to Receiver (Feet)	Existing Noise Level2 (dBA)	Project Generated Noise (dBA)	Moderate Impact	Severe Impact	FTA Impact
19	Florence	444 Osage – Residential	D	1	2	55	260	69	49	64-69	>69	No Impact
20	Florence	700, 708 Florence – Residential	D	2	2	55	184	69	57	64-69	>69	No Impact
21	Florence	714 Florence – Residential	D	1	2	55	200	69	57	64-69	>69	No Impact
22	Florence	Edward Vincent Park	D	1	1	55	520[3]	60	48	58-63	>63	No Impact
23	Florence	Inglewood Park Cemetery	2	1	3	55	160	60	51	63-68	>68	No Impact
24	Florence	7124 West Blvd – Residential	1	1	2	55	192	73	57	66-71	>71	No Impact
25	Florence	7112 West Blvd – Residential	1	1	2	55	120	73	60	66-71	>71	No Impact
26	Florence	7107 Brynhurst – Residential	1	1	2	55	120	73	54	66-71	>71	No Impact
52	Crenshaw	5919, 5925 Crenshaw – Residential	C	2	2	35	64	77	56	66-74	>74	No Impact
53	Crenshaw	5909 Crenshaw – Residential	C	1	2	35	72	77	63	66-74	>74	No Impact
54	Crenshaw	5903 Crenshaw - Residential	C	1	2	35	64	77	62	66-74	>74	No Impact
55	Crenshaw	Bethel Chapel Community Church	C	1	3	35	75	75	57	71-78	>78	No Impact
56	Slauson	G Life Records	C	1	1	55	290	75	52	66-73	>73	No Impact
57	Crenshaw	View Park Preparatory Accelerated Schools	C	1	3	35	72	75	57	71-78	>78	No Impact
58	Crenshaw	5716, 5720, 5728 Crenshaw – Residential	C	3	2	35	74	77	63	66-74	>74	No Impact
59	Crenshaw	Iglesia De Dios Pentecostal	B	1	3	35	80	71	56	71-75	>75	No Impact

Table 4-15. LPA Noise Levels and Impacts (continued)

Receptor ID	Street that Alignment Follows	Type of Building	Monitoring Site I.D.	Number of Buildings	FTA Noise Category1	Train Speed (mph)	Distance of Trackwork to Receiver (Feet)	Existing Noise Level2 (dBA)	Project Generated Noise (dBA)	Moderate Impact	Severe Impact	FTA Impact
60	Crenshaw	Masjid Balal Ibn Rabah (Church)	B	1	3	35	80	75	56	71-78	>78	No Impact
61	Crenshaw	Muhammad Mosque No. 27	B	1	3	35	80	71	56	71-75	>75	No Impact
62	Crenshaw	Frederick Douglas Middle School	B	1	3	35	88	71	56	71-75	>75	No Impact
63	Crenshaw	5117 Crenshaw – Residential	B	1	2	35	88	72	61	66-71	>71	No Impact
64	Crenshaw	5101, 5107 Crenshaw – Residential	B	1	2	35	136	72	58	66-71	>71	No Impact
65	Crenshaw	5025, 5031 Crenshaw – Residential	B	2	2	35	135	72	58	66-71	>71	No Impact
66	Crenshaw	5009, 5017 Crenshaw – Residential	B	2	2	35	128	72	59	66-71	>71	No Impact
67	Crenshaw	5001 Crenshaw – Residential	B	2	2	35	120	72	59	66-71	>71	No Impact
68	Crenshaw	Bethesda Temple Apostolic Church	B	1	3	35	80	71	56	71-75	>75	No Impact
63	Crenshaw	5117 Crenshaw – Residential	B	1	2	35	88	72	61	66-71	>71	No Impact
69	Crenshaw	Sweet Hour of Prayer Faith Church	B	1	3	35	80	71	56	71-75	>75	No Impact
70	Crenshaw	3315, 3319, 3321 50th – Residential	B	1	2	35	72	72	62	66-71	>71	No Impact
71	Crenshaw	4924, 4928 Crenshaw – Residential	B	1	2	35	112	72	59	66-71	>71	No Impact
72	Crenshaw	4916 Crenshaw – Residential	B	2	2	35	88	72	61	66-71	>71	No Impact

Table 4-15. LPA Noise Levels and Impacts (continued)

Receptor ID	Street that Alignment Follows	Type of Building	Monitoring Site I.D.	Number of Buildings	FTA Noise Category1	Train Speed (mph)	Distance of Trackwork to Receiver (Feet)	Existing Noise Level2 (dBA)	Project Generated Noise (dBA)	Moderate Impact	Severe Impact	FTA Impact
73	Crenshaw	Crenshaw Montessori Academy	B	1	3	35	75	71	54	71-75	>75	No Impact
74	Crenshaw	4908 Crenshaw – Residential	B	1	2	35	144	72	58	66-71	>71	No Impact
75	Crenshaw	4904 Crenshaw – Residential	B	1	2	35	115	72	59	66-71	>71	No Impact
76	Crenshaw	4900 Crenshaw – Residential	B	1	2	35	77	72	62	66-71	>71	No Impact
77	Crenshaw	4822, 4826, 4830 Crenshaw – Residential	B	1	2	35	106	72	60	66-71	>71	No Impact
78	Crenshaw	4816 Crenshaw – Residential	B	1	2	35	82	72	61	66-71	>71	No Impact
79	Crenshaw	4802, 4808, 4812 Crenshaw – Residential	B	3	2	35	110	72	60	66-71	>71	No Impact
80	Crenshaw	4835 Crenshaw – Residential	B	1	2	35	80	72	62	66-71	>71	No Impact
81	Crenshaw	Escuela Elementary Center	B	1	3	35	80	71	56	71-75	>75	No Impact

Notes: [1] Land use category descriptors: FTA Category 1 = Buildings or parks where quiet is an essential element of their purpose; FTA Category 2 = Residences and other buildings where people sleep, such as hotels, apartments and hospitals; FTA Category 3 = Institutional land uses with primarily daytime and evening use, including schools, libraries and churches.

[2] L_{dn} is used for land uses with nighttime sensitivity to noise and for residential areas where FTA rather than FHWA noise procedures are applicable. Peak-hour L_{eq} is used for commercial, industrial, and other land uses that do not have nighttime noise sensitivity.

[3] Represents distance from alignment to amphitheater.

Figure 4-31. Noise-Sensitive Receptors – Century Boulevard to Manchester Avenue

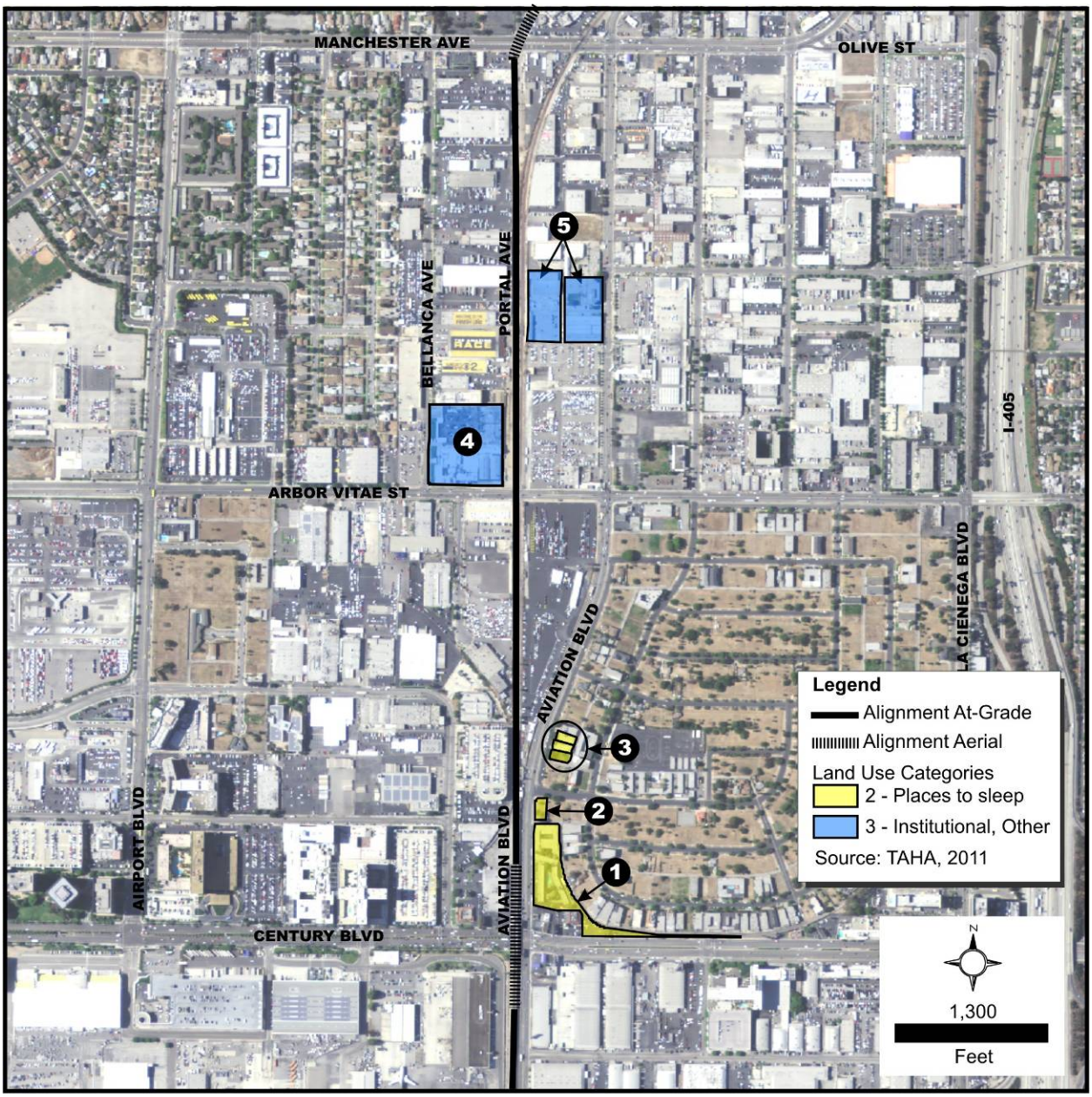


Figure 4-32. Noise-Sensitive Receptors – Hindry Avenue to La Brea Avenue

Figure 4-33. Noise-Sensitive Receptors – Market Street to Victoria Avenue

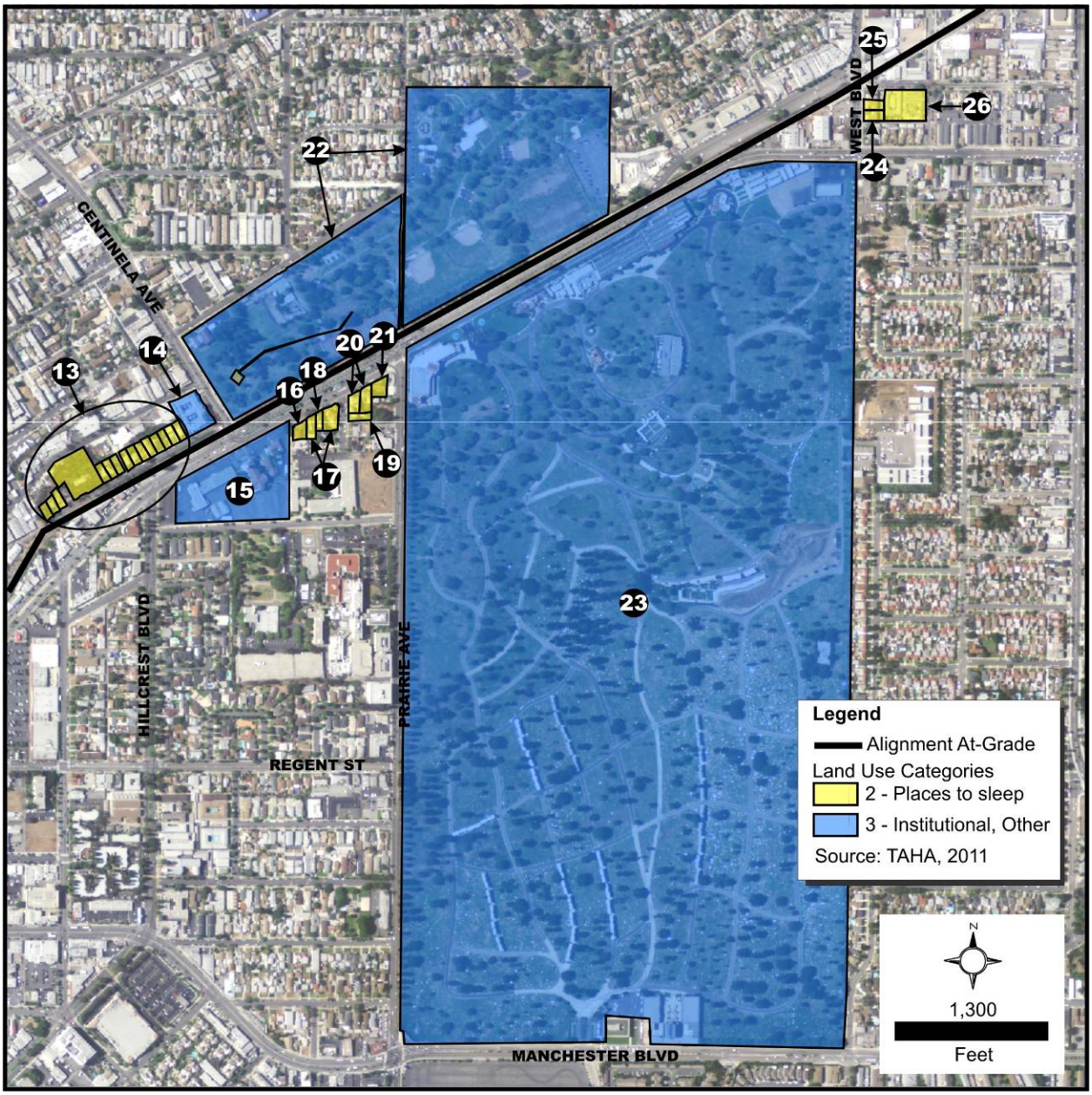


Figure 4-34. Noise-Sensitive Receptors – Harbor Subdivision to Slauson Avenue

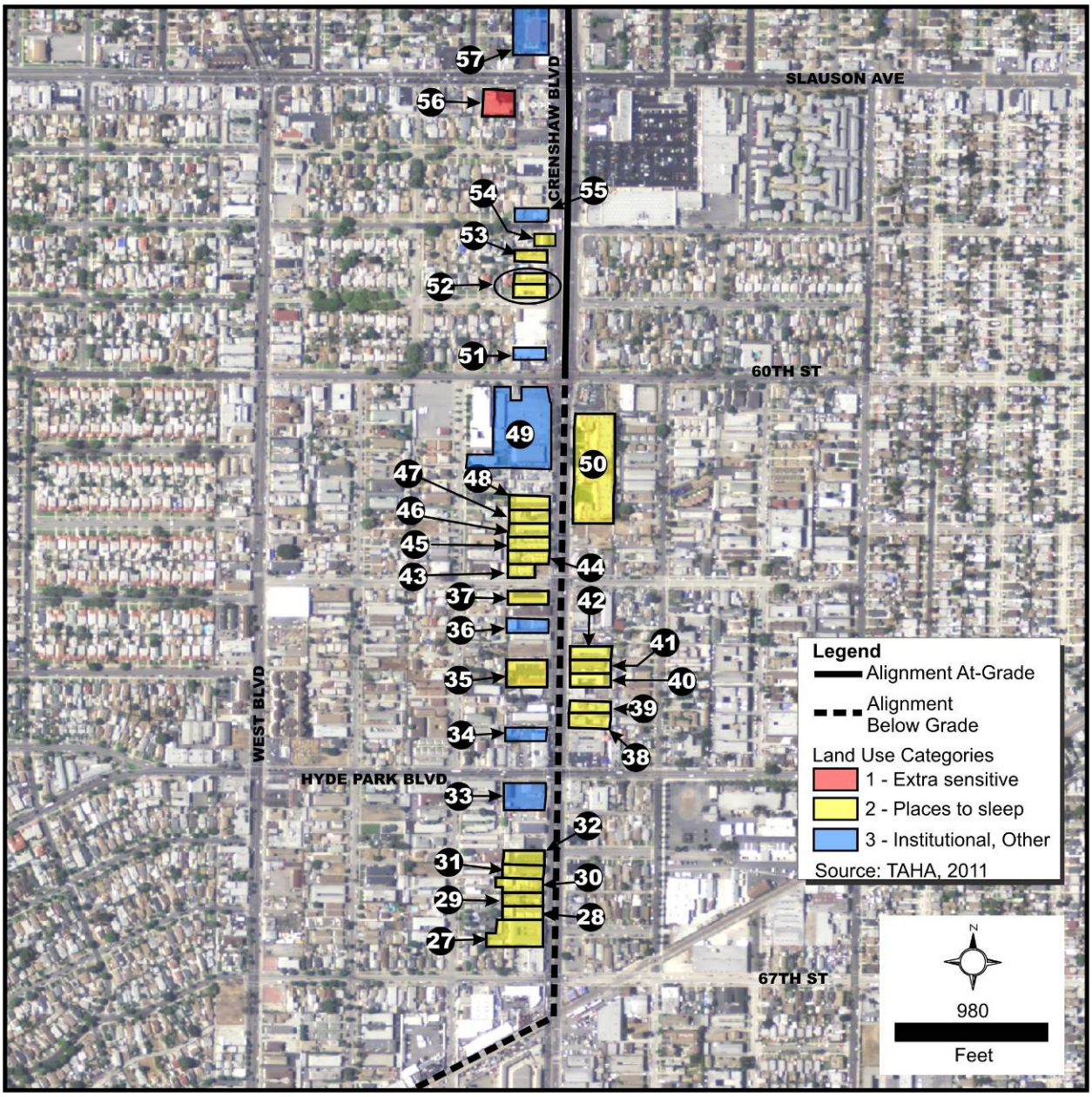


Figure 4-35. Noise-Sensitive Receptors – Slauson Avenue to 48th Street

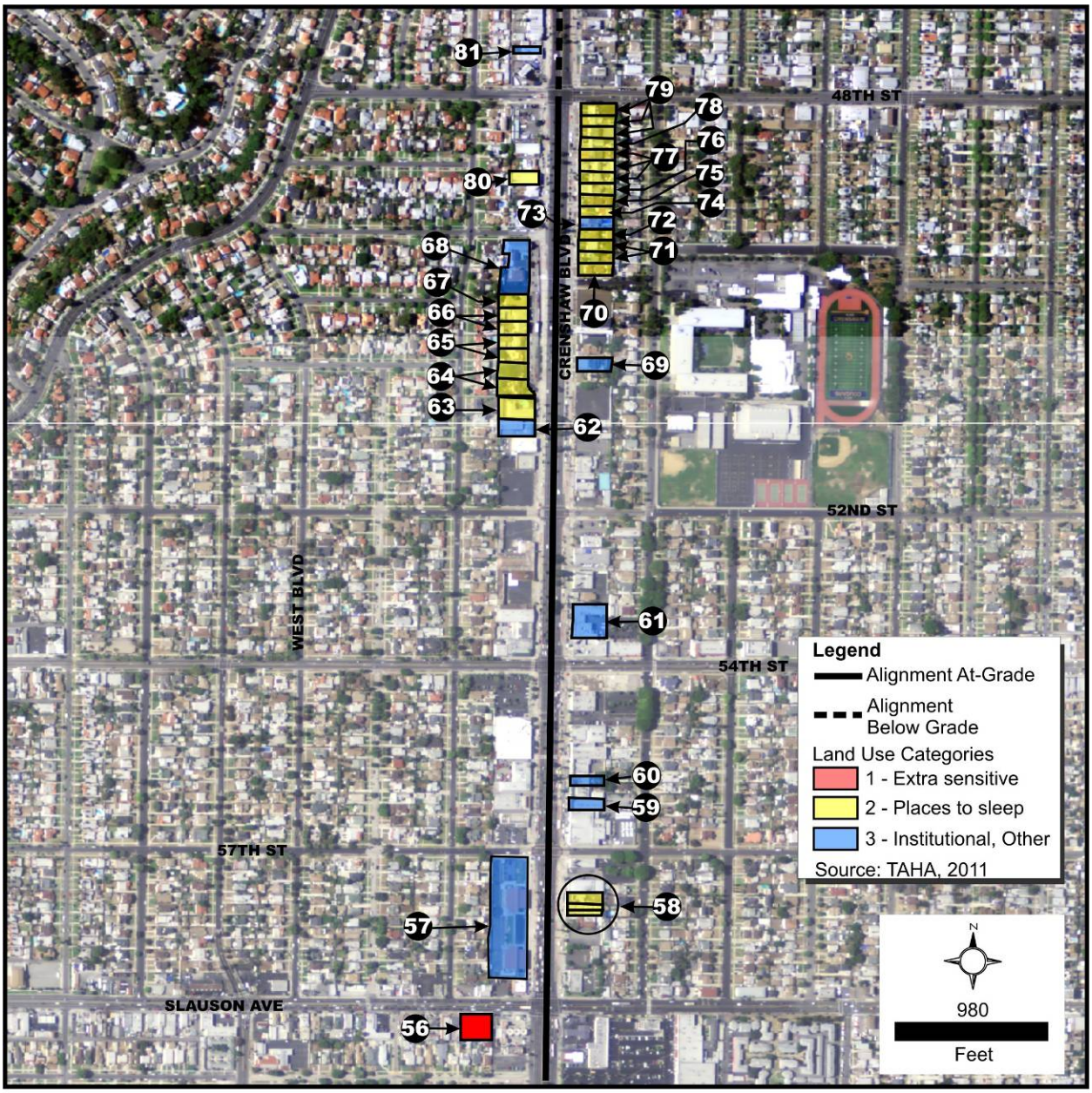


Figure 4-36. Noise-Sensitive Receptors – 48th Street to King Boulevard

Figure 4-37. Noise-Sensitive Receptors – King Boulevard to Exposition Boulevard

Special Trackwork

Special trackwork, which include switches, crossover diamonds, and turnouts, will generate higher passby noise levels than tangent track. An impact noise is generated on special trackwork as the wheel of the vehicle traverses a switch frog or crossover diamond gap. Wayside noise levels are estimated at 7 to 10 dBA higher than normal tangent track operations at those buildings that are closest to the special trackwork. Above grade special trackwork would be located near the intersection of Crenshaw Boulevard and Vernon Avenue. The passby noise analysis in Table 4-15 accounts for special trackwork noise. Therefore, no additional adverse effects from special trackwork would result beyond what was described for passby noise.

Table 4-16. Ventilation Shaft Noise

Location	Distance (feet)	FTA Noise Category	L_{eq}, L_{dn} (dBA)				
			Existing	Project Noise[2]	Moderate Impact	Severe Impact	Impact?
Aviation Blvd and 111th St	No Receptor						
Aviation Blvd between 111th and 104th Sts	No Receptor						
Aviation Blvd and 104th St	No Receptor						
Crenshaw Blvd and 67th St	75	2	77	52	64-69	>69	No
Crenshaw and 59th St	Adjacent	2	77	59	66-74	>74	No
Crenshaw Blvd and Vernon Ave	175	1	71	49	66-71	>71	No

Source: TAHA, 2011.
Notes: [1] FTA threshold for moderate noise impact.
[2] Noise level at closest receptor using a reference noise level of 60 dBA L_{eq} at 50 feet and 55 dBA L_{dn} at 50 feet.

Wheel Squeal

Sections of track with tight curves potentially can create a nuisance noise condition referred to as wheel squeal. The sliding or rubbing of the steel wheels of the LRT cars across the head of the steel rail causes wheel squeal. Wheel squeal impacts could occur along tight curves in the track with radii of less than 400 feet. There are two locations along the proposed LRT alignment that include tight curves in the track with radii of less than 400 feet: the north side of the Florence and La Brea Avenues station and the southern terminus. Based on FTA screening guidance, there are no sensitive receptors near these curves that require additional analysis. Therefore, no adverse effects are expected.

Ventilation Shafts

Both normal and emergency air ventilation would be supplied to the tunnel sections and underground stations with fans located in the station box. The same fans used for emergency ventilation will also be used for normal ventilation at reduced speeds. Potential noise levels from the ventilation systems would be from the passby of trains transmitting through the vent shaft to the street, the operation of the ventilation fans under normal conditions, and the testing of the emergency ventilation fans. The vent

shaft and the emergency ventilation fans will be designed to control noise levels from these sources to the noise guidelines required by the MTA Systemwide Design Criteria for a residential area: 60 dBA for train passby noise levels and 50 dBA for the fan noise, at a distance of 50 feet or to the nearest residential building, whichever is closer (55 dBA L_{dn}). The FTA screening guidance requires a ventilation shaft noise assessment for locations where receptors would be within 200 feet with an unobstructed view or within 100 feet with an obstructed view. In cut and cover tunnel sections without adjoining stations, ventilation would be provided by the use of jet fans in the structure. Table 4-16 shows ventilation shaft noise at the nearest receptor. Ventilation shaft noise levels would not exceed the FTA impact criteria. Therefore, no adverse effects are expected.

Ancillary Facilities

The project includes ten TPSSs. Each TPSS will be designed to control operating noise levels to the noise guidelines required by the MTA Systemwide Design Criteria: 50 dBA at 50 feet or the nearest residential building, whichever is closer. The FTA screening guidance requires a TPSS noise assessment for locations where receptors would be within 250 feet with an unobstructed view or within 125 feet with an obstructed view. Table 4-17 shows TPSS noise at the nearest receptor. TPSS noise levels would not exceed the FTA impact criteria. Therefore, no adverse effects are expected.

Table 4-17. TPSS Noise

TPPS Site #	Location	Distance (feet)	FTA Noise Category	L_{eq} or L_{dn} (dBA)				
				Existing	Project Noise[2]	Moderate Impact	Severe Impact	FTA Impact?
1	Hornet Ave and Imperial Hwy	No Receptor						
2	Century Blvd and Aviation Blvd	No Receptor						
3	Aviation Blvd and Florence Ave	No Receptor						
4	Florence Ave and Cedar Ave	No Receptor						
5	Florence Ave and La Brea Ave	No Receptor						
6	Florence Ave and Redondo Ave	200	2	69	44	64-69	>69	No
7	Crenshaw Blvd and 60th St	Adjacent	2	77	56	66-74	>74	No
8	Crenshaw Blvd and 48th St	Adjacent	2	72	56	66-71	>71	No
9	Crenshaw Blvd and MLK Blvd	No Receptor (Below Grade)						
10	Crenshaw and Rodeo Rd	No Receptor (Below Grade)						

Source: TAHA, 2011.
Notes: [1] FTA threshold for moderate noise impact.
[2] Noise level at closest receptor using a reference noise level of 50 dBA at 50 feet.

Warning Signals for the At-grade Crossings

Audible warnings are required by the California Public Utilities Commission (CPUC) at all gate-protected at-grade crossings. The required audible warnings are ringing bells that are located on the masts of the crossing gates and sounding of horns located on the lead vehicle of the trains. No audible warnings are required at street crossings where the light-

rail trains would operate in the street right-of-way and would be controlled by traffic signals. Light-rail vehicles will be equipped with quackers. The quacker has not been included as a separate source in the noise analysis because the noise from the quacker adds only a marginal amount to the noise exposure at speeds of 35 mph and greater and train speeds would be at least 35 mph. It is not known how often the emergency horn will be utilized. It is anticipated to be infrequent as the main purpose is to warn pedestrians or automobiles that are on the tracks as a train approaches. The emergency horn is 10 dB louder than the quacker. However, it will be used infrequently and also has not been included in the noise analysis.

FTA guidance requires that the warning signal analysis be completed using a reference noise level of 109 dBA at 50 feet. As shown in Table 4-18, warning signal noise would exceed the significance criteria at 57th Street and West Boulevard grade crossing. Therefore, adverse effects are expected without mitigation.

Table 4-18. Warning Signal Noise

Location	Distance (feet)	FTA Noise Category	L_{eq} or L_{dn} (dBA)[1]				
			Existing	Project Noise[3]	Moderate Impact	Severe Impact	Impact?
Aviation Blvd and Arbor Vitae St	682	3	66	42.6	67-72	>72	No
Florence Ave and Hindry Ave	No Receptor						
Florence Ave and Oak St	120	2	68	57.7	63-68	>68	No
Florence Ave and Cedar Ave	430	2	68	46.6	63-68	>68	No
Florence Ave and Eucalyptus Ave	408	2	68	47.1	63-68	>68	No
Florence Ave and Ivy Ave	350	3	68	48.4	63-68	>68	No
Florence Ave and Centinela Ave	72	2	69	62.1	64-69	>69	No
Florence Ave and West Blvd	36	2	69	68.1	64-69	>69	**Moderate**
Florence Ave and Brynhurst Ave	120	2	69	57.7	64-69	>69	No
Crenshaw Blvd and Slauson	128	3	68	57.1	63-68	>68	No
Crenshaw Blvd and 57th St	36	3	68	68.1	63-68	>68	**Severe**
Crenshaw Blvd and 54th St	96	3	64	59.6	66-70	>70	No
Crenshaw Blvd and 52nd St	180	2	72	54.2	66-71	>71	No
Crenshaw Blvd and 48th St	56	2	72	64.3	66-71	>71	No

Source: TAHA, 2011.
Notes: [1] Bell noise only.
[2] FTA threshold for moderate noise impact.
[3] Closest receptor.

Park and Ride Locations

The LPA would include three park and ride stations. One station would be located on Florence Avenue between La Brea and Centinela Avenues. Nine residential land uses on La Colina Drive, one residential land use on Hillcrest Boulevard, and the Blessed Family Covenant Church are within the FTA 125-foot screening distance. Regarding the residential receptors, the existing noise level is 69 dBA L_{dn} and a moderate noise impact

would occur at 64 dBA. The reference SEL of 101 dBA generated a noise level of 53.7 L_{dn} at the residential receptors. Regarding the Church, the existing noise level is 68 dBA L_{eq} and a moderate noise impact would occur at 63 dBA. The park and ride facility would generate a noise level of 51.1 L_{eq} at the church. The FTA impact criteria would not be exceeded at this park and ride facility. Therefore, no adverse effects are expected.

Another park and ride facility would be located near the intersection of Florence Avenue and West Boulevard. One residential land use to the east is within the FTA 125-foot screening distance. The existing noise level is 68 dBA L_{dn} and a moderate noise impact would occur at 63 dBA. Park and Ride facility noise would be 55.6 L_{dn} at the residential receptors. The FTA impact criteria would not be exceeded at this park and ride facility. Therefore, no adverse effects are expected.

The third park and ride facility would be located near the intersection of Crenshaw and Exposition Boulevards. Two residential land uses to the west are within the FTA 125-foot screening distance. The existing noise level is 72 dBA L_{dn} and a moderate noise impact would occur at 66 dBA. Park and Ride facility noise would be 52.3 L_{dn} at the residential receptors. The FTA impact criteria would not be exceeded at this park and ride facility. Therefore, no adverse effects are expected.

Noise impacts were not identified along the below-grade segment that would be eliminated under MOS-King. Similarly, no noise impacts were identified at the at-grade and aerial segments eliminated under MOS-Century. Thus, the MOSs would not alter the conclusions of the LPA analysis.

Ground-Borne Noise and Vibration

Table 4-19 displays the projected ground-borne vibration levels for those building structures along the at grade section of the alignment. The LPA would exceed the vibration criteria at 16 locations. Therefore, adverse effects are expected without mitigation.

Table 4-19. Ground-Borne Vibration Analysis: At-Grade Sections

Receptor ID	Street Location	Building Type	Number of Buildings	Distance to Track (Feet)	Train Speed (mph)	FTA Vibration Criteria (VdB)	Predicted Vibration Levels (VdB)
1	Aviation	5447 Century – Residential	1	123	35	72	63
2	Aviation	5524 98th – Residential	1	123	35	72	63
3	Aviation	9706, 9712, 9720 Aviation – Residential	3	240	35	72	57
4	Aviation	Merle Norman Building	1	88	35	75	66
5	Aviation	Crimson Technical College	1	60	35	75	69
6	Florence	Westchester Playhouse	1	335	35	72	57
7	Florence	7862 Midfield – Residential	1	150	35	72	60

Table 4-19. Ground-Borne Vibration Analysis: At-Grade Sections (continued)

Receptor ID	Street Location	Building Type	Number of Buildings	Distance to Track (Feet)	Train Speed (mph)	FTA Vibration Criteria (VdB)	Predicted Vibration Levels (VdB)
8	Florence	Stilleto Entertainment	1	160	35	65	60
9	Florence	129 Ash – Residential	1	136	35	72	62
10	Florence	619 Regent – Residential	2	120	35	72	63
11	Florence	Faithful Central Bible Church	1	72	35	75	68
12	Florence	Courthouse	1	83	55	72	70
13	Florence	333 - 423 La Colina, 338 Beach – Residential	15	64	55	72	**73**
14	Florence	Briercrest Inglewood Healthcare Center	1	72	55	65	**71**
15	Florence	St. John's Chrystostom Church and School	1	200	55	75	61
16	Florence	600 Florence – Residential	1	192	55	72	62
17	Florence	612 Florence – Residential	1	220	55	72	61
18	Florence	608, 618 Florence – Residential	2	200	55	72	61
19	Florence	444 Osage – Residential	1	260	55	72	61
20	Florence	700, 708 Florence – Residential	2	184	55	72	63
21	Florence	714 Florence – Residential	1	200	55	72	61
22	Florence	Edward Vincent Park	1	520	55	75	61
23	Florence	Inglewood Park Cemetery	1	160	55	75	64
24	Florence	7124 West – Residential	1	192	55	72	62
25	Florence	7112 West – Residential	1	120	55	72	67
26	Florence	7107 Brynhurst – Residential	1	120	55	72	67
52	Crenshaw	5919, 5925 Crenshaw – Residential	2	64	35	72	69
53	Crenshaw	5909 Crenshaw – Residential	1	72	35	72	68
54	Crenshaw	5903 Crenshaw – Residential	1	64	35	72	69
55	Crenshaw	Bethel Chapel Community Church	1	75	35	75	67
56	Slauson	G Life Records	1	290	55	65	61
57	Crenshaw	View Park Preparatory Accelerated Schools	1	72	35	75	68
58	Crenshaw	5716, 5720, 5728 Crenshaw – Residential	3	74	55	72	71
59	Crenshaw	Iglesia De Dios Pentecostal	1	80	35	75	66

Table 4-19. Ground-Borne Vibration Analysis: At-Grade Sections (continued)

Receptor ID	Street Location	Building Type	Number of Buildings	Distance to Track (Feet)	Train Speed (mph)	FTA Vibration Criteria (VdB)	Predicted Vibration Levels (VdB)
60	Crenshaw	Masjid Balal Ibn Rabah (Church)	1	80	35	75	66
61	Crenshaw	Muhammad Mosque No. 27	1	80	35	75	66
62	Crenshaw	Frederick Douglas Middle School	1	88	35	75	66
63	Crenshaw	5117 Crenshaw – Residential	1	88	35	72	66
64	Crenshaw	5101, 5107 Crenshaw – Residential	2	136	35	72	62
65	Crenshaw	5025, 5031 Crenshaw – Residential	2	135	35	72	62
66	Crenshaw	5009, 5017 Crenshaw – Residential	2	128	35	72	63
67	Crenshaw	5001 Crenshaw – Residential	1	120	35	72	63
68	Crenshaw	Bethesda Temple Apostolic Church	1	80	35	75	66
69	Crenshaw	Sweet Hour of Prayer Faith Church	1	80	35	75	66
70	Crenshaw	3315, 3319, 3321 50th – Residential	1	72	35	72	68
71	Crenshaw	4924, 4928 Crenshaw – Residential	2	112	35	72	64
72	Crenshaw	4916 Crenshaw – Residential	1	88	35	72	66
73	Crenshaw	Crenshaw Montessori Academy	1	75	35	75	67
74	Crenshaw	4908 Crenshaw – Residential	1	144	35	72	61
75	Crenshaw	4904 Crenshaw – Residential	1	115	35	72	64
76	Crenshaw	4900 Crenshaw – Residential	1	77	35	72	67
77	Crenshaw	4822, 4826, 4830 Crenshaw – Residential	3	106	35	72	65
78	Crenshaw	4816 Crenshaw – Residential	1	82	35	72	66
79	Crenshaw	4802, 4808, 4812 Crenshaw – Residential	3	110	35	72	64
80	Crenshaw	4835 Crenshaw – Residential	1	80	35	72	66
81	Crenshaw	Escuela Elementary Center	1	80	35	75	66

Source: TAHA, 2011.

The analysis presented in Table 4-19 is related to ground-borne vibration causing human annoyance or interfering with use of vibration-sensitive equipment. It is extremely rare for vibration from train operations to cause building damage, even minor cosmetic damage, but train operations can cause building damage to extremely fragile historic buildings located very close to the track. Historic buildings have been included in Table 4-19. The damage criteria for buildings that are extremely susceptible to vibration damage is 90 VdB. All vibration levels at historic structures would be substantially less than 90 VdB. Therefore, no adverse effects to historic buildings are expected.

Table 4-20 presents the projected ground-borne noise and vibration levels for building structures along the underground subway section of the alignment. The vibration criteria would be exceeded at four locations and the ground-borne noise criteria would be exceeded at 24 locations. Therefore, adverse effects are expected without mitigation at those locations.

Table 4-20. Ground-Borne Noise and Vibration Analysis: Below-Grade Sections

Receptor ID	Street Location	Building Type	Distance to Track (Feet)	Train Speed (mph)	FTA Vibration Criteria (VdB)	Predicted Vibration Levels (VdB)	FTA Ground-Borne Noise Criteria (dBA)	Predicted Noise Levels (dBA)
27	6627 Crenshaw	Residential	43	25	72	68	35	33
28	6621 Crenshaw	Residential	50	30	72	69	35	34
29	6613 Crenshaw	Residential	43	35	72	71	35	**36**
30	6607 Crenshaw	Residential	58	35	72	69	35	34
31	6601 Crenshaw	Residential	43	35	72	71	35	**36**
32	6531 Crenshaw	Residential	43	35	72	71	35	**36**
33	6501 Crenshaw	Hyde Park Congressional Church	43	35	75	71	40	36
34	6416 Crenshaw	Mission Cristiana El Amor (Church)	43	35	75	71	40	36
35	6345 Crenshaw	Cornett Motel	43	35	72	71	35	**36**
36	6315 Crenshaw	Revival Center Church of God	43	35	75	71	40	36
37	6303 Crenshaw	Crenshaw Inn Motel	43	35	72	71	35	**36**
38	6419 Crenshaw	Residential	50	35	72	70	35	**35**
39	6412 Crenshaw	Residential	74	35	72	68	35	33
40	6340 Crenshaw	Hyde Park Motel	43	35	72	71	35	**36**
41	6332 Crenshaw	Residential	43	35	72	71	35	**36**
42	6326 Crenshaw	Residential	50	35	72	70	35	**35**
43	3413 63rd	Residential	89	55	72	70	35	**35**
44	6215 Crenshaw	Residential	50	35	72	70	35	**35**
45	6207 Crenshaw	Residential	47	35	72	71	35	**36**

Table 4-20. Ground-Borne Noise and Vibration Analysis: Below-Grade Sections (continued)

Receptor ID	Street Location	Building Type	Distance to Track (Feet)	Train Speed (mph)	FTA Vibration Criteria (VdB)	Predicted Vibration Levels (VdB)	FTA Ground-Borne Noise Criteria (dBA)	Predicted Noise Levels (dBA)
46	6203 Crenshaw	Residential	47	35	72	71	35	**36**
47	6131 Crenshaw	Residential	50	35	72	70	35	**35**
48	6121 Crenshaw	Residential	43	35	72	71	35	**36**
49	6103 Crenshaw	St. John the Evangelist School and Church	54	35	75	70	40	35
50	6028 Crenshaw	Senior Living Facility	90	35	2	65	35	30
51	5969 Crenshaw	St. Mark's Baptist Church	58	55	75	73	40	38
82	4601 Crenshaw	Harrison-Ross Mortuary	64	35	75	69	25	**35**
83	4514 Crenshaw	Today's Fresh Start School	261	35	75	57	40	22
84	4508 Crenshaw	Golden Day & University	231	35	75	57	40	22
85	4434 Crenshaw	Tavis Smiley Foundation	16	35	65	**>78**	25	**>43**
86	4309 Crenshaw	2 Down Front Entertainment	60	35	65	**69**	25	**34**
86	4309 Crenshaw	Laq Records	120	35	65	63	25	**28**
87	4225 Crenshaw	Maverick's Flat	45	35	65	**71**	25	**36**
88	4101 Crenshaw	Broadway Department Store	84	35	75	66	40	31
89	4005 Crenshaw	May Company Building (Macy's)	92	55	75	69	40	34
90	4030 Crenshaw	DWP Building	41	35	75	71	40	36
91	3964 to 3514 Crenshaw	Residential	88	55	72	70	35	**35**
92	3875 Crenshaw	Angelus Funeral Home	92	35	65	65	25	**30**
93	3773 Crenshaw	Lulu Washington Dance Theater	80	55	72	70	35	**35**
94	3683 Crenshaw	One United Bank	28	25	75	72	40	37
95	3677 Crenshaw	Jim Eve Records	50	35	65	**70**	25	**35**
96	3600 Crenshaw	West Los Angeles Church of God	201	35	75	57	40	22

Source: TAHA, 2011