Appendix G
Acoustical Assessment

Acoustical Assessment
for the proposed
Melia 178th Street Townhomes Project
in the City of Gardena, California

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LIST OF ABBREVIATED TERMS

ADT	average daily traffic
BNL	basic noise level
CEQA	California Environmental Quality Act
CL	centerline
CNEL	community equivalent noise level
cy	cubic yards
dB	decibel
dBA	A-weighted sound level
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
ft	foot/feet
FTA	Federal Transit Administration
HVAC	heating ventilation and air conditioning
Hz	hertz
in/sec	inches per second
L_{dn}	day-night noise level
L_{eq}	equivalent noise level
L_{max}	maximum noise level
L_{min}	minimum noise level
mph	miles per hour
PPV	peak particle velocity
RMS	root mean square
sf	square foot
µPa	micropascals
VdB	vibration velocity level

1 INTRODUCTION

This report documents the results of an Acoustical Assessment completed for the Melia 178th Street Townhomes Project (Project). The purpose of this Acoustical Assessment is to evaluate the Project's potential construction and operational noise and vibration levels and determine the level of impact the Project would have on the environment.

1.1 PROJECT LOCATION & SETTING

The Project site is in the County of Los Angeles (County), in the City of Gardena (City), approximately 12.5 miles south of downtown Los Angeles; see Exhibit 1: Regional Vicinity Map. The 5.63-acre (AC) property is comprised of two parcels (APN 6106-013-040 and 6106-013-041) located at 1515 West 178th Street; see Exhibit 2: Site Vicinity Map. Regional access to the Project site is provided via the Artesia Freeway (State Route 91 (SR-91)), the San Diego Freeway (Interstate 405 (I 405)) and the Harbor Freeway (State Route 110 (SR-110)) located to the northeast, south, and east, respectively. Local access to the Project site is provided via West 178th Street to the south, which is accessed from Normandie Avenue to the east, and South Western Avenue to the west. Two access driveways are currently located at 178th Street, at the eastern and western portions of the site.

The Project site is at the southern portion of the City, in a predominantly industrial area, although residential uses exist west of Denker Avenue. The site is bounded by a vacant lot and an equestrian use (i.e., horse stables) to the north, industrial uses to the south on the other side of West 178th Street , office commercial and industrial uses to the east, and a mobile home park to the west.

As depicted on Exhibit 2-2, the Project site is fully developed as an industrial use totaling approximately 105,036 square feet (SF) and including a trucking warehouse with associated surface parking lot and outdoor trailer storage. The warehouse is used for maintenance and storage of trucks and trailers.

The Project site is designated Industrial with a Mixed-Use Overlay[1] and zoned General Industrial (M-2) Zone with a Mixed-Use Overlay (MU) Zone.[2]

1.2 PROJECT DESCRIPTION

The Project proposes to develop a residential community consisting of 114 three-story, attached townhomes; see Exhibit 3: Conceptual Site Plan. The 114 residential dwelling units (DU) would be constructed in 22 buildings, with between four and six DU per building. The proposed Project would have a density of 20.24 DUAC (gross). The Project proposes to remove all existing onsite improvements (approximately 105,036 square-foot (SF) and construct approximately 191,348 SF of new townhomes, 48,727 SF of common open space, and 21,279 SF of private open space. The maximum proposed building height would be 40 feet (to roof ridge). A total of 287 parking spaces, including resident and guest, are proposed. The Project proposes General Plan Amendment (GPA) #XX to change the site's land use designation from Industrial with a Mixed Use Overlay to High Density Residential, and Zone Change (ZC) #XX to change the site's zoning from General Industrial (M-2) with a Mixed-Use Overlay Zone (MU) to High Density Multiple-Family Residential Zone (R-4).

[1] City of Gardena. (2006, Updated February 2013). *Gardena General Plan 2006. Figure LU-2: 2013 General Plan Land Use Policy Map*. Gardena, CA: City of Gardena.
[2] City of Gardena. (January 2018). *Zoning Map*. Gardena, CA: City of Gardena Planning Division.

Project Construction and Phasing

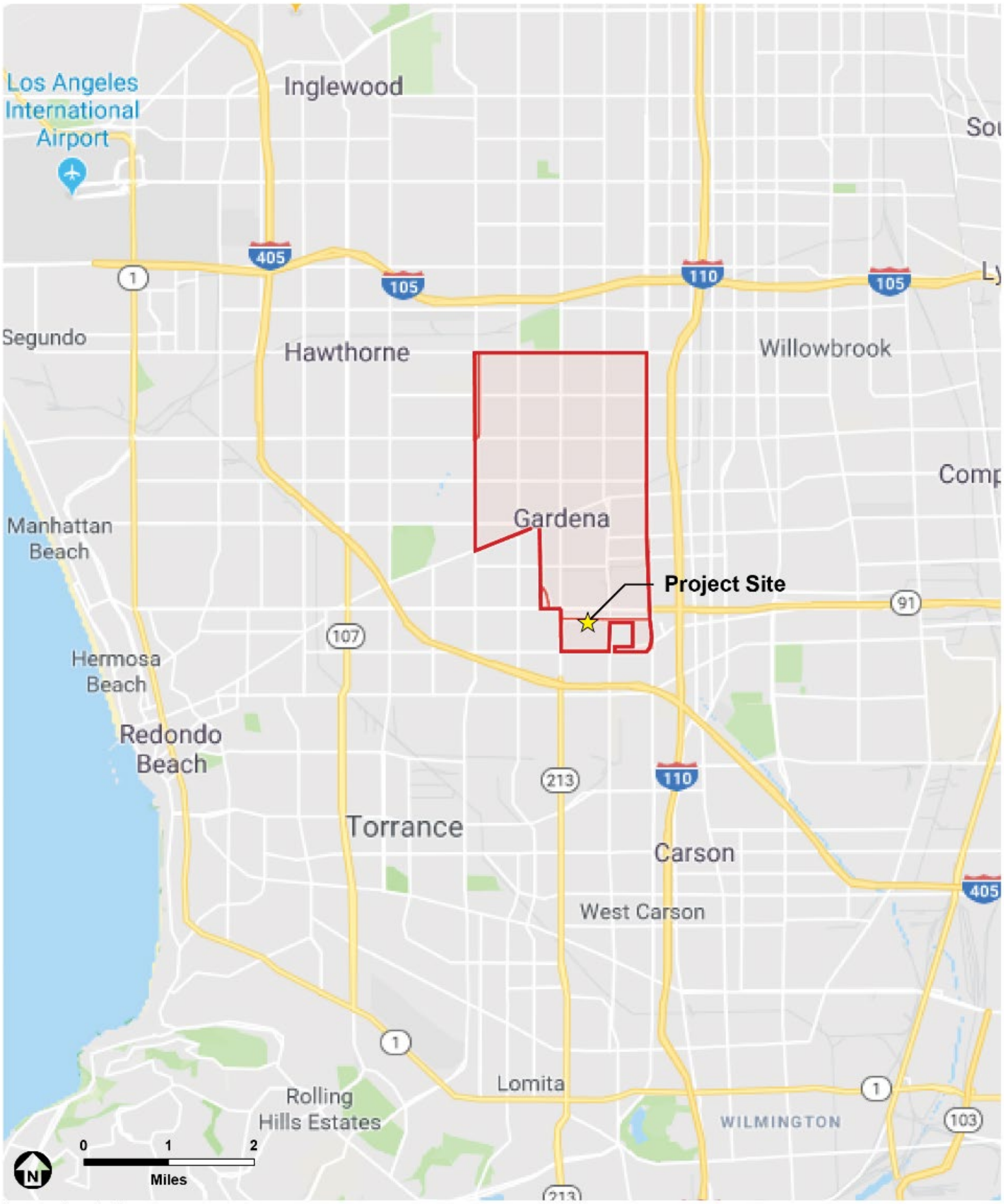
Project construction is anticipated to occur beginning in the Fall of 2019 and ending early 2021, in the following sequence:

- Demolition,
- Site Preparation,
- Grading,
- Building Construction, and
- Paving, Architectural Coating, and Landscaping.

Grading for the proposed improvements would require cut and fill to create building pads. Grading is estimated to require approximately 7,600 cubic yards (CY) of soil import. Final grading plans would be approved by the City Engineer before Grading Permit issuance. All infrastructure (i.e., storm drain, water, wastewater, dry utilities, and street improvements) would be installed during grading.

Home construction would occur over approximately five to seven phases, the timing of which would be dependent upon market conditions. For purposes of this environmental analysis, opening year is assumed to be 2021.

Exhibit 1: Regional Vicinity

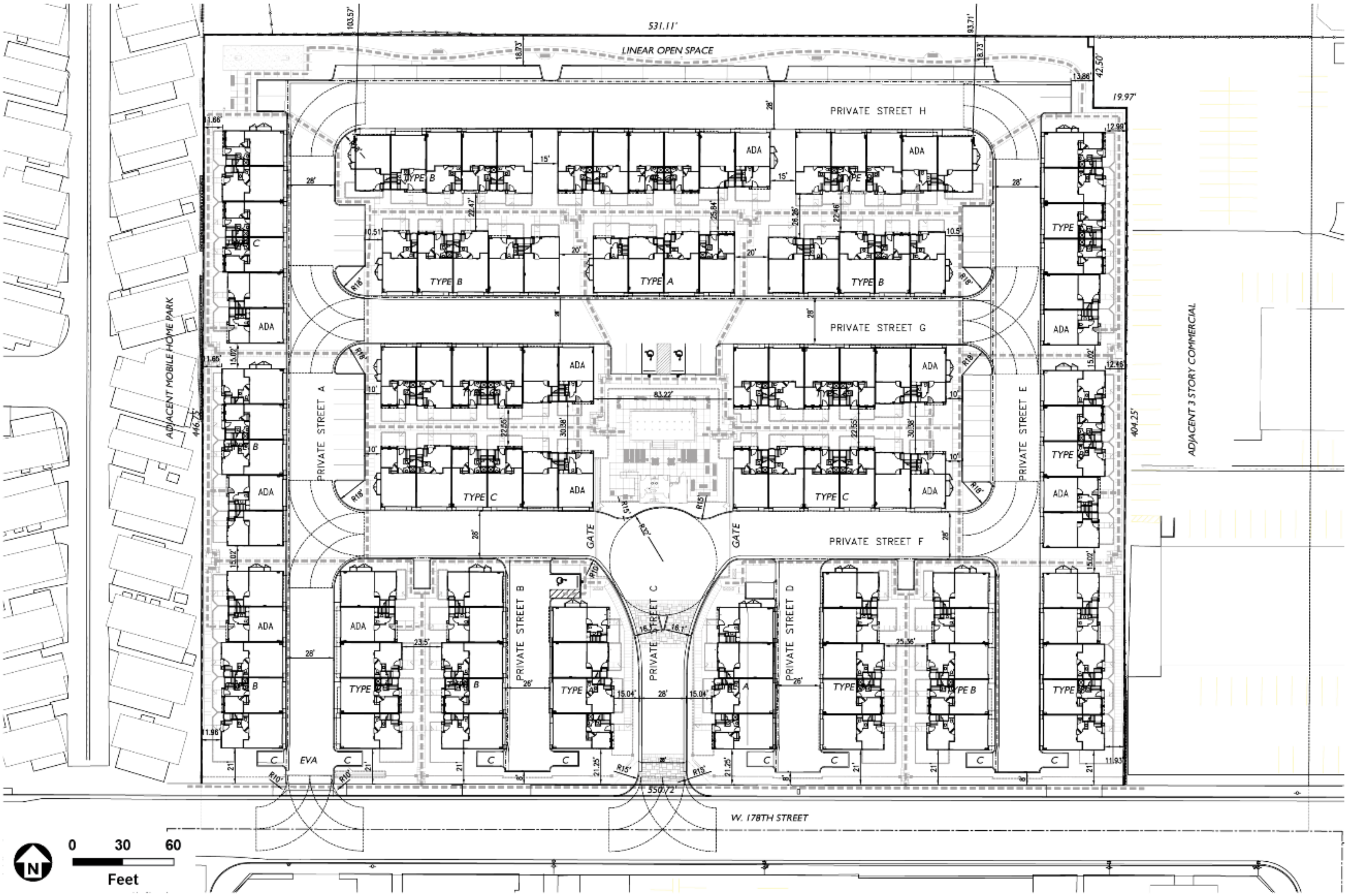


Source: Google Maps

Exhibit 2: Site Vicinity

Source: Near Maps

Exhibit 3: Site Plan



2 ACOUSTIC FUNDAMENTALS

2.1 SOUND AND ENVIRONMENTAL NOISE

Acoustics is the science of sound. Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a medium (e.g., air) to human (or animal) ear. If the pressure variations occur frequently enough (at least 20 times per second), they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound and is expressed as cycles per second, or hertz (Hz).

Noise is defined as loud, unexpected, or annoying sound. In acoustics, the fundamental model consists of a noise source, a receptor, and the propagation path between the two. The loudness of the noise source, obstructions, or atmospheric factors affecting the propagation path, determine the perceived sound level and noise characteristics at the receptor. Acoustics deal primarily with the propagation and control of sound. A typical noise environment consists of a base of steady background noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this background noise is the sound from individual local sources. These sources can vary from an occasional aircraft or train passing by to continuous noise from traffic on a major highway. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a large range of numbers. To avoid this, the decibel (dB) scale was devised. The dB scale uses the hearing threshold of 20 micropascals (µPa) as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The dB scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels correspond closely to human perception of relative loudness. Table 1: Typical Noise Levels, provides typical noise levels.

Table 1: Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	– 110 –	Rock Band
Jet fly-over at 1,000 feet		
	– 100 –	
Gas lawnmower at 3 feet		
	– 90 –	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	– 80 –	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawnmower, 100 feet	**– 70 –**	Vacuum cleaner at 10 feet
Commercial area		Normal Speech at 3 feet
Heavy traffic at 300 feet	**– 60 –**	
		Large business office
Quiet urban daytime	**– 50 –**	Dishwasher in next room
Quiet urban nighttime	**– 40 –**	Theater, large conference room (background)
Quiet suburban nighttime		
	– 30 –	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	– 20 –	
		Broadcast/recording studio
	– 10 –	
Lowest threshold of human hearing	**– 0 –**	Lowest threshold of human hearing

Source: California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013.

Noise Descriptors

The dB scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Several rating scales have been developed to analyze the adverse effect of community noise on people. Because environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise, as well as the time of day when the noise occurs. The equivalent noise level (L_{eq}) is the average noise level averaged over the measurement period, while the day-night noise level (L_{dn}) and Community Equivalent Noise Level (CNEL) are measures of energy average during a 24-hour period, with dB weighted sound levels from 7:00 p.m. to 7:00 a.m. Most commonly, environmental sounds are described in terms of an average level (L_{eq}) that has the same acoustical energy as the summation of all the time-varying events. Each is applicable to this analysis and defined in Table 2: Definitions of Acoustical Terms.

Table 2: Definitions of Acoustical Terms

Term	Definitions
Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in µPa (or 20 micronewtons per square meter), where 1 pascals is the pressure resulting from a force of 1 newton exerted over an area of 1 square meter. The sound pressure level is expressed in dB as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 µPa). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level (dBA)	The sound pressure level in dB as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level (L_{eq})	The average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
Maximum Noise Level (L_{max}) Minimum Noise Level (L_{min})	The maximum and minimum dBA during the measurement period.
Exceeded Noise Levels (L_{01}, L_{10}, L_{50}, L_{90})	The dBA values that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day-Night Noise Level (L_{dn})	A 24-hour average L_{eq} with a 10-dBA weighting added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity at nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.4 dBA L_{dn}.
Community Noise Equivalent Level (CNEL)	A 24-hour average L_{eq} with a 5-dBA weighting during the hours of 7:00 a.m. to 10:00 a.m. and a 10-dBA weighting added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.7 dBA CNEL.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends on its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

The A-weighted decibel (dBA) sound level scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends on the distance between the receptor and the noise source.

A-Weighted Decibels

The perceived loudness of sounds is dependent on many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable and can be approximated by dBA values. There is a strong correlation between dBA and the way the human ear perceives sound. For this reason, the dBA has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of dBA, but are expressed as dB, unless otherwise noted.

Addition of Decibels

The dB scale is logarithmic, not linear, and therefore sound levels cannot be added or subtracted through ordinary arithmetic. Two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic dB is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound and twice as loud as a 60-dBA sound. When two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dBA higher than one source under the same conditions. Under the dB scale, three sources of equal loudness together would produce an increase of 5 dBA.

Sound Propagation and Attenuation

Sound spreads (propagates) uniformly outward in a spherical pattern, and the sound level decreases (attenuates) at a rate of approximately 6 dB for each doubling of distance from a stationary or point source. Sound from a line source, such as a highway, propagates outward in a cylindrical pattern. Sound levels attenuate at a rate of approximately 3 dB for each doubling of distance from a line source, such as a roadway, depending on ground surface characteristics. No excess attenuation is assumed for hard surfaces like a parking lot or a body of water. Soft surfaces, such as soft dirt or grass, can absorb sound, so an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed. For line sources, an overall attenuation rate of 3 dB per doubling of distance is assumed.

Noise levels may also be reduced by intervening structures; generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm reduces noise levels by 5 to 10 dBA. The way older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows. The exterior-to-interior reduction of newer residential units is generally 30 dBA or more.

Human Response to Noise

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels.

Noise environments and consequences of human activities are usually well represented by median noise levels during the day or night or over a 24-hour period. Environmental noise levels are generally considered low when the CNEL is below 60 dBA, moderate in the 60 to 70 dBA range, and high above 70 dBA. Examples of low daytime levels are isolated, natural settings with noise levels as low as 20 dBA and quiet, suburban, residential streets with noise levels around 40 dBA. Noise levels above 45 dBA at night can disrupt sleep. Examples of moderate-level noise environments are urban residential or semi-commercial areas (typically 55 to 60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with noisier urban residential or residential-commercial areas (60 to 75 dBA) or dense urban or industrial areas (65 to 80 dBA). Regarding increases in dBA, the following relationships should be noted:

- Except in carefully controlled laboratory experiments, a 1-dBA change cannot be perceived by humans.
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference.
- A minimum 5-dBA change is required before any noticeable change in community response would be expected. A 5-dBA increase is typically considered substantial.
- A 10-dBA change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

Effects of Noise on People

Hearing Loss

While physical damage to the ear from an intense noise impulse is rare, a degradation of auditory acuity can occur even within a community noise environment. Hearing loss occurs mainly due to chronic exposure to excessive noise but may be due to a single event such as an explosion. Natural hearing loss associated with aging may also be accelerated from chronic exposure to loud noise. The Occupational Safety and Health Administration has a noise exposure standard that is set at the noise threshold where hearing loss may occur from long-term exposures. The maximum allowable level is 90 dBA averaged over 8 hours. If the noise is above 90 dBA, the allowable exposure time is correspondingly shorter.

Annoyance

Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn} as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. A noise level of about 55 dBA L_{dn} is the threshold at which a substantial percentage of people begin to report annoyance.[3]

2.2 GROUNDBORNE VIBRATION

Sources of groundborne vibrations include natural phenomena (earthquakes, volcanic eruptions, sea waves, landslides, etc.) or man-made causes (explosions, machinery, traffic, trains, construction equipment, etc.). Vibration sources may be continuous (e.g., factory machinery) or transient (e.g., explosions). Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One is the peak particle velocity (PPV); another is the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. The RMS velocity is defined as the average of the squared amplitude of the signal. The PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration.

Table 3: Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibrations, displays the reactions of people and the effects on buildings produced by continuous vibration levels. The annoyance levels shown in the table should be interpreted with care since vibration may be found to be annoying at much lower levels than those listed, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high noise environments, which are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

Table 3: Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibrations

Peak Particle Velocity (inches/second)	Approximate Vibration Velocity Level (VdB)	Human Reaction	Effect on Buildings
0.006-0.019	64-74	Range of threshold of perception	Vibrations unlikely to cause damage of any type
0.08	87	Vibrations readily perceptible	Recommended upper level to which ruins and ancient monuments should be subjected
0.1	92	Level at which continuous vibrations may begin to annoy people, particularly those involved in vibration sensitive activities	Virtually no risk of architectural damage to normal buildings
0.2	94	Vibrations may begin to annoy people in buildings	Threshold at which there is a risk of architectural damage to normal dwellings
0.4-0.6	98-104	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Architectural damage and possibly minor structural damage

Source: California Department of Transportation, *Transportation and Construction-Induced Vibration Guidance Manual*, 2004.

[3] Federal Interagency Committee on Noise, *Federal Agency Review of Selected Airport Noise Analysis Issues*, August 1992.

Ground vibration can be a concern in instances where buildings shake, and substantial rumblings occur. However, it is unusual for vibration from typical urban sources such as buses and heavy trucks to be perceptible. Common sources for groundborne vibration are planes, trains, and construction activities such as earth-moving which requires the use of heavy-duty earth moving equipment. For the purposes of this analysis, a PPV descriptor with units of inches per second (in/sec) is used to evaluate construction-generated vibration for building damage and human complaints.

3 REGULATORY SETTING

To limit population exposure to physically or psychologically damaging as well as intrusive noise levels, the Federal government, the State of California, various county governments, and most municipalities in the state have established standards and ordinances to control noise.

3.1 STATE OF CALIFORNIA

California Government Code

California Government Code Section 65302(f) mandates that the legislative body of each county and city adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines established by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of "normally acceptable", "conditionally acceptable", "normally unacceptable", and "clearly unacceptable" noise levels for various land use types. Single-family homes are "normally acceptable" in exterior noise environments up to 60 CNEL and "conditionally acceptable" up to 70 CNEL. Multiple-family residential uses are "normally acceptable" up to 65 CNEL and "conditionally acceptable" up to 70 CNEL. Schools, libraries, and churches are "normally acceptable" up to 70 CNEL, as are office buildings and business, commercial, and professional uses.

Title 24 – Building Code

The State's noise insulation standards are codified in the California Code of Regulations, Title 24: Part 1, Building Standards Administrative Code, and Part 2, California Building Code. These noise standards are applied to new construction in California for interior noise compatibility from exterior noise sources. The regulations specify that acoustical studies must be prepared when noise-sensitive structures, such as residential buildings, schools, or hospitals, are located near major transportation noise sources, and where such noise sources create an exterior noise level of 65 dBA CNEL or higher. Acoustical studies that accompany building plans must demonstrate that the structure has been designed to limit interior noise in habitable rooms to acceptable noise levels. For new multi-family residential buildings, the acceptable interior noise limit for new construction is 45 dBA CNEL.

3.2 LOCAL

City of Gardena General Plan

The City of Gardena General Plan (General Plan) establishes goals, policies, and programs to protect residents from excessive noise. The General Plan identifies transportation, such as arterials and train movements, as the most significant noise-producing sources, as well as fixed sources[4]. Land uses near these significant noise-producers can incorporate buffers and noise control techniques including setbacks, landscaping, building transitions, site design, and building construction techniques to reduce the impact of excessive noise. Selection of the appropriate noise control technique would vary depending on the level of noise that needs to be reduced as well as the location and intended land use. The General Plan includes acceptable noise levels associated with specific land uses; refer to <u>Table 4: Gardena Noise and Land Use Compatibility</u>.

[4] City of Gardena, *General Plan Community Safety Element Noise Plan,* 2006.

Table 4: Gardena Noise and Land Use Compatibility

Land Use Category	CNEL, dBA[1]						
	<	55	60	65	70	75	80
Residential – Single family, multifamily, duplex	A	A	B	C	C	NA	NA
Residential – Mobile homes	A	A	B	C	C	NA	NA
Transient Lodging – Motels, hotels	A	A	B	B	C	C	NA
Schools, Libraries, Churches, Hospitals, Nursing Homes	A	A	B	C	C	NA	NA
Auditoriums, concert Halls, Amphitheaters, Meeting Halls	B	B	C	C	NA	NA	NA
Sports Arenas, Outdoor Spectator Sports, Amusement Parks	A	A	A	B	B	NA	NA
Playgrounds, Neighborhood Parks	A	A	A	B	C	NA	NA
Golf Courses, Riding Stables, Cemeteries	A	A	A	A	B	C	C
Office and Professional Buildings	A	A	A	B	B	C	NA
Commercial Retail, Banks, Restaurants, Theaters	A	A	A	A	B	B	C
Industrial, Manufacturing Utilities, Wholesale, Service Stations	A	A	A	A	B	B	B
Agriculture	A	A	A	A	A	A	A

NOTE:
1. CNEL = Community Equivalent Noise Level; dBA = Decibel

LEGEND:
A – Normally Acceptable – Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
B – Conditionally Acceptable – New construction or development should be undertaken only after a detailed analysis of the noise requirements is made and needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
C – Normally Unacceptable – New construction or development should generally be discouraged. If it does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
D – Clearly Unacceptable – New construction or development should generally not be undertaken.
NA – Not Applicable

Source: City of Gardena, *General Plan Community Safety Element Noise Plan*, 2006.

The City has designated several streets/street segments as truck routes. General Plan Figure CI-3 illustrates the locations of designated truck routes within Gardena and indicates those nearest the Project site are Normandie Avenue to the east and Western Avenue to the west.[5]

City of Gardena Municipal Code

City of Gardena Municipal Code (GMC) Sections 8.36.040 and 8.36.050 state the exterior and interior noise standards for the City in terms of $L_{eq}(15)$ and L_{max}. The allowable noise levels at land uses receiving noise are summarized in Table 5: Allowable Exterior and Interior Noise Levels. GMC Section 8.36.050(C) states that if the ambient noise level exceeds the noise standard, then the ambient noise level shall become the noise standard. GMC Section 8.36.080(G) states that noise associated with construction, repair, remodeling, grading, or demolition between the hours of 7:00 a.m. and 6:00 p.m. on weekdays and between the hours of 9:00 a.m. and 6:00 p.m. on Saturday are exempt from these noise standards. GMC

[5] City of Gardena. (2006, Updated February 2013). *Gardena General Plan 2006. Figure CI-3: Designated Truck Routes*. Gardena, CA: City of Gardena.

Section 8.36.070 prohibits the operation of a device that generates vibration which is above the perception threshold of an individual at or beyond the property line if the source is on private property.

Table 5: Allowable Exterior and Interior Noise Levels

Type of Land Use	15-Minute Average Noise Level (L_{eq} (15))		Maximum Noise Level (L_{max})	
	7 am – 10 pm	10 pm – 7am	7 am – 10 pm	10 pm – 7 am
Exterior Noise Levels				
Residential	55 dB(A)	50 dB(A)	75 dB(A)	70 dB(A)
Residential portions of mixed-use	60 dB(A)	50 dB(A)	80 dB(A)	70 dB(A)
Commercial	65 dB(A)	60 dB(A)	85 dB(A)	80 dB(A)
Industrial of manufacturing	70 dB(A)	70 dB(A)	90 dB(A)	90 dB(A)
Interior Noise Levels				
Residential	45 dB(A)	40 dB(A)	65 dB(A)	60 dB(A)
Residential portions of mixed-use	45 dB(A)	40 dB(A)	70 dB(A)	60 dB(A)

Source: City of Gardena, *Municipal Code*, Sections 8.36.040 and 8.36.050, 2018.

4 EXISTING CONDITIONS

4.1 EXISTING NOISE SOURCES

Gardena is impacted by various noise sources, including mobile and stationary. Mobile noise sources , especially cars, trucks, and trains are the most common and significant sources of noise. Other noise sources are the various land uses (i.e., residential, commercial, institutional, and recreational and park activities) throughout the City that generate stationary-source noise.

As previously noted, the Project site is fully developed as an industrial use with a trucking warehouse, associated surface parking lot, and outdoor trailer storage. The warehouse is used for maintenance and storage of trucks and trailers.

Mobile Sources

Land uses surrounding the Project site include: an equestrian use (i.e., horse stables) and a vacant lot within a power line easement to the north, industrial uses (generally between Normandie Avenue and Denker Avenue) to the south, single-family residential (west of Denker Avenue) to the southwest, a mobile home park to the west, and light industrial to the east. The existing mobile noise sources in the Project area are generated by motor vehicles traveling along West 178th Street, including the truck traffic associated with the existing onsite trucking warehouse. The General Plan has identified arterials and train movements as the City's most significant noise sources. The Circulation Element classifies 178th Street as a Collector roadway, not an Arterial.[6]

Stationary Sources

The primary stationary noise sources in the Project vicinity are those associated with operations of the onsite trucking warehouse and the industrial uses to the south and east. The stationary noise sources associated with the existing trucking warehouse include a surface parking lot, outdoor trailer storage, loading/unloading activities, and mechanical equipment (e.g., heating ventilation and air conditioning [HVAC] equipment)). The noise associated with these sources and other nearby sources may represent a single-event noise occurrence or short-term noise.

4.2 NOISE MEASUREMENTS

The Project site currently consists of a trucking warehouse with associated surface parking lot and outdoor trailer storage. To quantify existing ambient noise levels in the Project area, Kimley-Horn conducted two short-term noise measurements on March 26, 2019; see Appendix A: Existing Ambient Noise Measurements. The noise measurement sites were representative of typical existing noise exposure within and immediately adjacent to the Project site. The 10-minute measurements were taken between 11:00 a.m. and 12:00 p.m. Short-term L_{eq} measurements are considered representative of the noise levels throughout the day. The average noise levels and sources of noise measured at each location are listed in Table 6: Existing Noise Measurements and shown on Exhibit 4: Noise Measurement Locations.

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[6] City of Gardena. (2006, Updated February 2013). *Gardena General Plan 2006. Figure CI-1: Roadway Network*. Gardena, CA: City of Gardena.

Table 6: Existing Noise Measurements					
Site #	**Location**	**L_{eq} (dBA)**	**L_{min} (dBA)**	**L_{max} (dBA)**	**Time**
1	Southeast corner of 178th Street and Denker Avenue	67.8	46.5	86.0	11:19 a.m.
2	Southeast corner of Project site, along 178th Street	63.4	43.7	80.4	11:34 a.m.
Source: Noise measurements taken by Kimley-Horn, March 26, 2019. See Appendix A for noise measurement results.					

Exhibit 4: Noise Measurement Locations

Source: Near Maps

4.3 SENSITIVE RECEPTORS

Noise exposure standards and guidelines for various types of land uses reflect the varying noise sensitivities associated with each of these uses. Residences, hospitals, schools, guest lodging, libraries, and churches are treated as the most sensitive to noise intrusion and therefore have more stringent noise exposure targets than do other uses, such as manufacturing or agricultural uses that are not subject to impacts such as sleep disturbance. Sensitive receptors near the Project site consist mostly of single-family residences/mobile homes, religious institutions, educational institutions, and recreational facilities. Table 7: Sensitive Receptors, lists the distances and locations of sensitive receptors within the Project vicinity.

Table 7: Sensitive Receptors

Receptor Type/Description	Distance and Direction from the Project Site
RESIDENTIAL	
Mobile Home Park Residential Neighborhood	Adjacent to the west
Single-Family Residential Neighborhood	120 feet to the southwest
Single-Family Residential Neighborhood	475 feet to the south
Multi-Family Residential Dwelling	350 feet to the southeast
RELIGIOUS INSTITUTIONS	
Gardena Torrance Southern Baptist	580 feet to the southeast
Gardena Valley Assembly of God	1,150 feet to the south
Gospel Venture International Church	1,386 feet to the west
First Missionary Baptist Church	1,390 feet to the southeast
The Church of Jesus Christ of Latter-day Saints	2,680 feet to the northwest
St Francis Korean Catholic Church	3,000 feet to the west
EDUCATIONAL INSTITUTIONS	
Pacific Lutheran Jr./Sr. High School	1,150 feet to the south
Gardena High School	1,210 feet to the east
Riley High School Gardena	2,078 feet to the south
Arlington Elementary School	3,340 feet to the west
RECREATIONAL FACILITIES	
City of Torrance Guenser Park	2,300 feet to the west
Arthur Lee Johnson Memorial Park	2,670 feet to the northeast

5 SIGNIFICANCE CRITERIA AND METHODOLOGY

5.1 CEQA THRESHOLDS

Based upon the criteria derived from State California Environmental Quality Act (CEQA) Guidelines Appendix G, a project normally would have a significant effect on the environment if it would:

- Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Generate excessive groundborne vibration or groundborne noise levels;
- For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, the project exposes people residing or working in the project area to excessive noise levels.

5.2 METHODOLOGY

Construction noise estimates are based upon noise levels from the FHWA and Federal Transit Administration (FTA) data as well as the distance to nearby receptors. Reference noise levels are used to estimate noise levels at nearby sensitive receptors based on a standard noise attenuation rate of 6 dB per doubling of distance (line-of-sight method of sound attenuation for point sources of noise). Construction noise level estimates do not account for the presence of intervening structures or topography, which may reduce noise levels at receptor locations. Therefore, the noise levels presented herein represent a conservative, reasonable worst-case estimate of actual temporary construction noise.

This analysis of the existing and future noise environments is based on noise prediction modeling and empirical observations. Predicted construction noise levels were based on typical noise levels generated by construction equipment. Groundborne vibration levels associated with construction-related activities for the Project were evaluated utilizing typical groundborne vibration levels associated with construction equipment, obtained from FTA published data for construction equipment. Potential groundborne vibration impacts related to structural damage and human annoyance were evaluated, considering the distance from construction activities to nearby land uses and typically applied criteria for structural damage and human annoyance.

6 POTENTIAL IMPACTS AND MITIGATION

6.1 ACOUSTICAL IMPACTS

Threshold 6.1 Would the Project generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Construction Noise

Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g., land clearing, grading, excavation, paving). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. During construction, exterior noise levels could affect the residential neighborhoods surrounding the construction site. Project construction would occur adjacent to existing mobile homes residences to the west and existing single-family residences to the south. However, it is acknowledged that construction activities would occur throughout the Project site and would not be concentrated at a single point near sensitive receptors.

Construction activities would include site preparation, grading, building construction, paving, and architectural coating. Such activities would require graders, scrapers, and tractors during site preparation; graders, dozers, and tractors during grading; cranes, forklifts, generators, tractors, and welders during building construction; pavers, rollers, mixers, tractors, and paving equipment during paving; and air compressors during architectural coating. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full power operation followed by 3 to 4 minutes at lower power settings. Other primary sources of acoustical disturbance would be random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. Typical noise levels associated with individual construction equipment are listed in Table 8: Typical Construction Noise Levels.

The sensitive receptors nearest the Project site are residential uses: the mobile home park adjacent to the west; and the single-family residential neighborhood approximately 120 feet to the southwest. As shown in Table 8, exterior noise levels could affect the nearest existing noise-sensitive receptors. These sensitive receptors may be exposed to elevated noise levels during Project construction. However, construction noise would be acoustically dispersed throughout the Project site and not concentrated in one area near surrounding sensitive uses. The GMC does not establish quantitative construction noise standards. Instead, the City has established limited hours of construction activities. GMC Section 8.36.080 exempts noise associated with new construction activity, remodeling, rehabilitation, or grading of any property from the GMC noise limitations, provided construction activities take place between the hours of 7:00 a.m. and 6:00 p.m. on weekdays, between the hours of 9:00 a.m. and 6:00 p.m. on Saturdays, with no construction activities taking place at any time on Sundays or federal holidays. All motorized equipment used in such activity shall be equipped with functioning mufflers as mandated by the state.

Table 8: Typical Construction Noise Levels		
Equipment	**Typical Noise Level (dBA) at 50 feet from Source**	**Typical Noise Level (dBA) at 100 feet from Source[1]**
Air Compressor	80	74
Backhoe	80	74
Compactor	82	76
Concrete Mixer	85	77
Concrete Pump	82	76
Concrete Vibrator	76	79
Crane, Derrick	88	76
Crane, Mobile	83	70
Dozer	85	82
Generator	82	77
Grader	85	79
Impact Wrench	85	76
Jack Hammer	88	79
Loader	80	79
Paver	85	82
Pile-driver (Impact)	101	74
Pile-driver (Sonic)	95	79
Pneumatic Tool	85	95
Pump	77	89
Roller	85	79
Saw	76	71
Scraper	85	84
Shovel	82	89
Truck	84	79
Note: 1. Calculated using the inverse square law formula for sound attenuation: $dBA_2 = dBA_1+20Log(d_1/d_2)$ Where: dBA_2 = estimated noise level at receptor; dBA_1 = reference noise level; d_1 = reference distance; d_2 = receptor location distance		
Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.		

Construction activities may also cause increased noise along access routes to and from the Project site due to movement of equipment, materials, and workers. A maximum of approximately 7,600 CY of soil import is anticipated, which would be transported along local roadways, including 178th Street and the truck routes nearest the Project site (i.e., Normandie Avenue to the east and Western Avenue to the west). Compliance with GMC would minimize impacts from construction noise, as construction would be limited to daytime hours on weekdays and Saturdays. Thus, following compliance with GMC standards, Project construction activities would result in a less than significant noise impact.

Operational Noise

The Project proposes to replace the existing trucking warehouse with residential townhomes. Thus, the operational noise (stationary and traffic) associated with the existing trucking warehouse would cease and would be replaced with operational noise typical of residential uses. The major noise sources associated with the Project that would potentially impact existing and future nearby residences include stationary noise sources and off-site traffic noise.

Stationary Noise Sources. With Project implementation, the stationary noise sources (i.e., surface parking lot, outdoor trailer storage, loading/unloading activities, and HVAC equipment) associated with the existing trucking warehouse would be removed and replaced with stationary noise typical of residential uses. Noise typical of residential uses includes group conversations, pet noise, and general maintenance activities. Generally, noise levels from stationary sources are anticipated to decrease with implementation of the proposed residential uses, as compared to the existing industrial use, given the existing surface parking lot and outdoor trailer storage would be removed and loading/unloading activities would cease. Further, noise from residential stationary sources would primarily occur during the "daytime" activity hours of 7:00 a.m. to 10:00 p.m. Additionally, the residences would be required to comply with the General Plan and GMC noise standards.

The Project is surrounded primarily by residential and industrial uses. The nearest sensitive receptors to the Project site are the mobile home residences located adjacent to the west and single-family residences to the south across West 178th Street. Potential stationary noise sources related to long-term Project operations would include mechanical equipment. Mechanical equipment (e.g., heating ventilation and air conditioning [HVAC] equipment) typically generates noise levels of approximately 50 dBA at 50 feet. The HVAC units associated with the proposed buildings would be located approximately 25 feet from the closest sensitive receptors. At 25 feet, HVAC noise levels would be 56 dBA. Ground-mounted HVAC equipment is anticipated to be installed in the rear of proposed homes and attenuated by a solid property wall that would reduce noise levels to 48 dBA. As noise levels would be below the City's 55 dBA standard, noise impacts associated with HVAC equipment would be less than significant.

Nominal parking noise would occur within the onsite shared driveway and visitor parking stalls. Each of the proposed DU would include a two-car garage, which would attenuate parking noise. It is also noted that parking noise occurs at the adjacent properties under existing conditions. Parking and driveway noise would be consistent with the existing noise in the vicinity and would be partially masked by background traffic noise from motor vehicles traveling along West 178th Street. Actual noise levels over time resulting from parking activities are anticipated to be far below the City's noise standards. Therefore, noise impacts associated with parking would be less than significant.

Off-Site Traffic Noise. Project implementation would generate traffic volumes along West 178th Street and Project area roadways. The Project would result in 620 average daily vehicle trips (ADT).[7] This trip generation estimate is conservative given trip credits for the existing land uses that would be displaced have not been applied. When trip credits for the existing trucking warehouse are applied to the Project's trip generation estimates, the Project's net new trips would be offset, with proportionate offsets in traffic noise. Notwithstanding, for a conservative approach, this analysis assumes a traffic increase of 620 ADT. The Project's traffic would result in noise on Project area roadways. In general, a 3-dBA increase in traffic noise is barely perceptible to people, while a 5-dBA increase is readily noticeable. Traffic volumes on Project area roadways would have to approximately double for the resulting traffic noise levels to generate a 3-dBA increase.[8] The Circulation Element classifies 178th Street (the nearest roadway) as a Collector roadway, and therefore does not have calculated average daily traffic. These roadways carry an average of less than 15,000 vehicles per day.[9] Therefore, because the proposed Project would not generate sufficient traffic to result in a permanent 3-dBA increase in ambient noise levels, noise impacts associated with Project traffic would be less than significant.
Mitigation Measures: No mitigation is required.

[7] Kimley-Horn & Associates, *Melia 178th Street Townhomes Project – Trip Generation Analysis*, May 2019.
[8] According to the California Department of Transportation, *Technical Noise Supplement to Traffic Noise Analysis Protocol* (September 2013), it takes a doubling of traffic to create a noticeable (i.e., 3 dBA) noise increase.
[9] City of Gardena, *City of Gardena General Plan Draft Environmental Impact Report, pages 38-39*, January 2006.

Level of Significance: Less than significant impact.

Threshold 6.2 Would the Project generate excessive groundborne vibration or ground borne noise levels?

Construction

Increases in groundborne vibration levels attributable to the Project would be primarily associated with short-term construction-related activities. Project construction could result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and the operations involved.

The Federal Transit Administration (FTA) has published standard vibration velocities for construction equipment operations. In general, the FTA architectural damage criterion for continuous vibrations (i.e., 0.2 in/sec) appears to be conservative. The types of construction vibration impacts include human annoyance and building damage. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. Building damage can be cosmetic or structural. Ordinary buildings that are not particularly fragile would not experience any cosmetic damage (e.g., plaster cracks) at distances beyond 30 feet. This distance can vary substantially depending on the soil composition and underground geological layer between vibration source and receiver. In addition, not all buildings respond similarly to vibration generated by construction equipment. For example, for a building that is constructed with reinforced concrete with no plaster, the FTA guidelines show that a vibration level of up to 0.20 in/sec is considered safe and would not result in any construction vibration damage.

Table 9: Typical Construction Equipment Vibration Levels, lists vibration levels at 25 feet for typical construction equipment. Groundborne vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. As indicated in Table 9, based on FTA data, vibration velocities from typical heavy construction equipment operations that would be used during Project construction range from 0.003 to 0.089 in/sec PPV at 25 feet from the source of activity.

Table 9: Typical Construction Equipment Vibration Levels

Equipment	Peak Particle Velocity at 25 Feet (in/sec)
Large Bulldozer	0.089
Caisson Drilling	0.089
Loaded Trucks	0.076
Rock Breaker	0.059
Jackhammer	0.035
Small Bulldozer/Tractors	0.003

Notes:
[1] Calculated using the following formula: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$, where: PPV_{equip} = the peak particle velocity in in/sec of the equipment adjusted for the distance; PPV_{ref} = the reference vibration level in in/sec from Table 12-2 of the Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, 2018; D = the distance from the equipment to the receiver.

Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, 2018.

The nearest sensitive receptors to the Project site are the residential uses approximately 25 feet to the west from the proposed active construction zone. As shown in Table 8, at 25 feet, construction equipment vibration velocities would not exceed 0.089 in/sec PPV, which is below the FTA's 0.20 PPV threshold. It is also acknowledged that construction activities would occur throughout the Project site and would not be concentrated at the point closest to the nearest residential structure. Therefore, vibration impacts associated with the proposed Project would be less than significant.

Operations

The Project proposes a residential development that would not involve railroads or substantial heavy truck operations. Rather, the Project would remove the existing trucking warehouse, removing the groundborne vibration associated with the existing truck operations. Thus, the Project would not generate groundborne vibration that could be felt at surrounding uses. As a result, impacts from vibration associated with Project operations would be less than significant.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

Threshold 6.3 Would the Project be located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the project area to excessive noise levels?

The closest airports to the Project site are the Compton/Woodley Airport, located approximately 3.4 miles to the northeast, and the Hawthorne Municipal Airport, located approximately 4.0 miles to the north. The Project would not be located within 2.0 miles of a public airport or within an airport land use plan. Additionally, there are no private airstrips located within the Project vicinity. Therefore, the Project would not expose people residing or working in the Project area to excessive airport- or airstrip-related noise levels and no mitigation is required.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

6.2 CUMULATIVE NOISE IMPACTS

The Project's construction activities would not result in a substantial temporary increase in ambient noise levels. As discussed in Threshold 6.1, the City permits construction activities between 7:00 a.m. and 6:00 p.m. on weekdays, between 9:00 a.m. and 6:00 p.m. on Saturdays, and prohibits construction activities on Sundays and federal holidays. There would be periodic, temporary, noise impacts that would cease upon completion of construction activities. The Project would contribute to other proximate construction project noise impacts if construction activities were conducted concurrently. However, based on the noise analysis above, the Project's construction-related noise impacts would be less than significant following compliance with the GMC. Given that noise dissipates as it travels away from its source, operational noise impacts from on-site activities and other stationary sources would be limited to the Project site and vicinity. Thus, cumulative operational noise impacts from related projects, in conjunction with Project specific noise impacts, would not be cumulatively significant.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

7 REFERENCES

1. California Department of Transportation, *California Vehicle Noise Emission Levels*, 1987.
2. California Department of Transportation, *Traffic Noise Analysis Protocol*, May 2011.
3. California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013.
4. California Department of Transportation, *Transportation Related Earthborne Vibrations*, 2002.
5. California Department of Transportation, *Transportation and Construction-Induced Vibration Guidance Manual*, 2004.
6. City of Gardena, *General Plan 2006*.
7. City of Gardena, *Municipal Code*, 2018.
8. Federal Highway Administration, *Roadway Construction Noise Model*, 2006.
9. Federal Highway Administration, *Roadway Construction Noise Model User's Guide Final Report*, 2006.
10. Federal Interagency Committee on Noise, *Federal Agency Review of Selected Airport Noise Analysis Issues*, August 1992.
11. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Impact Assessment Manual*, September 2016.
12. Kimley-Horn & Associates, *Melia 178th Street Townhomes Project – Trip Generation Analysis,* May 2019.
13. Summa Architecture, *Site Plan*, November 2018.
14. United States Environmental Protection Agency, *Protective Noise Levels (EPA 550/9-79-100)*, November 1979.

Appendix A

Existing Ambient Noise Measurements

Noise Measurement Field Data

Project:	Melia 178th Street Gardena	**Job Number:**	194091003
Site No.:	1	**Date:**	3/26/2019
Analyst:	Josh Cortez	**Time:**	11:19 AM
Location:	Southeast corner of 178th Street and Denker Avenue		
Noise Sources:	Cars passing, idling delivery truck, bicycle, second delivery		
Comments:			

Results (dBA):

	Leq:	Lmin:	Lmax:	Peak:
Measurement 1:	67.8	46.5	86.0	105.9

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	66°
Wind (mph):	< 5
Sky:	Clear
Bar. Pressure:	30.03"
Humidity:	50%

Photo:

Kimley»Horn

Summary

File Name on Meter	MEL.001
File Name on PC	SLM_0005586_MEL_001.00.ldbin
Serial Number	0005586
Model	SoundExpert® LxT
Firmware Version	2.302
User	Josh Cortez
Location	Melia 178th Street Gardena
Job Description	
Note	

Measurement

Description	
Start	2019-03-26 11:19:52
Stop	2019-03-26 11:29:52
Duration	00:10:00.0
Run Time	00:10:00.0
Pause	00:00:00.0
Pre Calibration	2019-03-19 13:06:53
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting	
Peak Weight	Z Weighting	
Detector	Slow	
Preamp	PRMLxT1L	
Microphone Correction	Off	
Integration Method	Linear	
OBA Range	Normal	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	At LMax	
Overload	122.3 dB	
	A	**C**
Under Range Peak	78.5	75.5
Under Range Limit	**27.5**	26.1
Noise Floor	17.0	17.0

Results

LA_{eq}	67.8 dB	
LAE	95.5 dB	
EA	398.375 µPa²h	
$LZ_{peak\ (max)}$	2019-03-26 11:22:55	105.9
LAS_{max}	2019-03-26 11:22:55	86.0
LAS_{min}	2019-03-26 11:19:53	46.5

SEA	-99.9 dB	
LAS > 85.0 dB (Exceedance Counts / Duration)	1	1.1
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0
LZpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0
LZpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0
LZpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0
Community Noise	**Ldn**	**LDay 07:00-22:00**
	67.8	67.8

LCeq	76.7 dB
LAeq	67.8 dB
LCeq - LAeq	8.9 dB
LAIeq	72.0 dB
LAeq	67.8 dB
LAIeq - LAeq	4.3 dB

	A	
	dB	**Time Stamp**
Leq	67.8	
LS(max)	86.0	2019/03/26 11:22:55
LS(min)	46.5	2019/03/26 11:19:53
LPeak(max)		

# Overloads	0
Overload Duration	0.0 s
# OBA Overloads	0
OBA Overload Duration	0.0 s

Statistics

LAS5.00	70.5 dB
LAS10.00	68.6 dB
LAS33.30	67.5 dB
LAS50.00	67.3 dB
LAS66.60	67.0 dB
LAS90.00	51.6 dB

Calibration History

Preamp	Date	dB re. 1V/Pa
PRMLxT1L	2019-03-19 13:06:48	-28.5
PRMLxT1L	2019-02-19 10:14:47	-28.3
PRMLxT1L	2018-12-03 16:15:39	-28.4
PRMLxT1L	2018-12-03 10:57:25	-28.2
PRMLxT1L	2018-12-03 10:54:28	-28.2
PRMLxT1L	2018-11-28 12:17:47	-28.1
PRMLxT1L	2018-11-28 12:17:28	-28.2
PRMLxT1L	2018-11-28 07:59:06	-28.3
PRMLxT1L	2018-11-21 08:32:58	-28.3

Noise Measurement Field Data

Project:	Melia 178th Street Gardena	**Job Number:**	194091003
Site No.:	2	**Date:**	3/26/2019
Analyst:	Josh Cortez	**Time:**	11:34 AM
Location:	On sidewalk of southeast corner of project site, on 178th Street		
Noise Sources:	Cars passing, delivery truck		
Comments:			

Results (dBA):

	Leq:	Lmin:	Lmax:	Peak:
Measurement 1:	63.4	43.7	80.4	98.5

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	68°
Wind (mph):	< 5
Sky:	Clear
Bar. Pressure:	30.02"
Humidity:	47%

Photo:

Kimley»Horn

Summary		
File Name on Meter	MEL.002	
File Name on PC	SLM_0005586_MEL_002.00.ldbin	
Serial Number	0005586	
Model	SoundExpert® LxT	
Firmware Version	2.302	
User	Josh Cortez	
Location	Melia 178th Street Gardena	
Job Description		
Note		

Measurement		
Description		
Start	2019-03-26 11:34:12	
Stop	2019-03-26 11:44:12	
Duration	00:10:00.0	
Run Time	00:10:00.0	
Pause	00:00:00.0	
Pre Calibration	2019-03-19 13:06:48	
Post Calibration	None	
Calibration Deviation	---	

Overall Settings		
RMS Weight	A Weighting	
Peak Weight	Z Weighting	
Detector	Slow	
Preamp	PRMLxT1L	
Microphone Correction	Off	
Integration Method	Linear	
OBA Range	Normal	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	At LMax	
Overload	122.3 dB	
	A	**C**
Under Range Peak	78.5	75.5
Under Range Limit	**27.5**	26.1
Noise Floor	17.0	17.0

Results		
LAeq	63.4 dB	
LAE	91.2 dB	
EA	145.609 µPa²h	
LZpeak (max)	2019-03-26 11:35:36	98.5
LASmax	2019-03-26 11:40:33	80.4
LASmin	2019-03-26 11:41:08	43.7

SEA	-99.9 dB	
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0
LZpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0
LZpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0
LZpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0

Community Noise	**Ldn**	**LDay 07:00-22:00**
	63.4	63.4

LCeq	68.8 dB
LAeq	63.4 dB
LCeq - LAeq	5.4 dB
LAIeq	65.0 dB
LAeq	63.4 dB
LAIeq - LAeq	1.6 dB

	A	
	dB	**Time Stamp**
Leq	63.4	
LS(max)	80.4	2019/03/26 11:40:33
LS(min)	43.7	2019/03/26 11:41:08
LPeak(max)		

# Overloads	0
Overload Duration	0.0 s
# OBA Overloads	0
OBA Overload Duration	0.0 s

Statistics

LAS5.00	69.0 dB
LAS10.00	64.9 dB
LAS33.30	53.9 dB
LAS50.00	50.3 dB
LAS66.60	48.2 dB
LAS90.00	46.4 dB

Calibration History

Preamp	**Date**	**dB re. 1V/Pa**
PRMLxT1L	2019-03-19 13:06:48	-28.5
PRMLxT1L	2019-02-19 10:14:47	-28.3
PRMLxT1L	2018-12-03 16:15:39	-28.4
PRMLxT1L	2018-12-03 10:57:25	-28.2
PRMLxT1L	2018-12-03 10:54:28	-28.2
PRMLxT1L	2018-11-28 12:17:47	-28.1
PRMLxT1L	2018-11-28 12:17:28	-28.2
PRMLxT1L	2018-11-28 07:59:06	-28.3
PRMLxT1L	2018-11-21 08:32:58	-28.3