APPENDIX I – NOISE AND VIBRATION IMPACT ANALYSIS

NOISE AND VIBRATION IMPACT ANALYSIS

JOHN S. GIBSON TRAILER LOT PROJECT

PORT OF LOS ANGELES, CALIFORNIA

LSA

August 2024

NOISE AND VIBRATION IMPACT ANALYSIS

JOHN S. GIBSON TRAILER LOT PROJECT

PORT OF LOS ANGELES, CALIFORNIA

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LIST OF ABBREVIATIONS AND ACRONYMS

CalEEMod	California Emissions Estimator Model
CEQA	California Environmental Quality Act
City	City of Los Angeles
CNEL	Community Noise Equivalent Level
dB	decibel(s)
dBA	A-weighted decibel(s)
FHWA	Federal Highway Administration
ft	foot/feet
FTA	Federal Transit Administration
FTA Manual	Federal Transit Administration's *Transit Noise and Vibration Impact Assessment Manual*
I-110	Interstate 110
in/sec	inches per second
L_{dn}	day-night average noise level
L_{eq}	equivalent continuous sound level
L_{max}	maximum instantaneous sound level
PCE	passenger car equivalent
PPV	peak particle velocity
project	John S. Gibson Trailer Lot Project
RMS	root-mean-square
sq ft	square foot/feet
VdB	vibration velocity decibels

INTRODUCTION

This noise and vibration impact analysis has been prepared to evaluate the potential noise and vibration impacts and reduction measures associated with the John S. Gibson Trailer Lot Project (project) in Los Angeles, California. This report is intended to satisfy the City of Los Angeles's (City) requirement for a project-specific noise impact analysis by examining the impacts of the project site and evaluating noise reduction measures that the project may require.

PROJECT LOCATION AND DESCRIPTION

The 18.635-acre project site is located at 1599 John S. Gibson Boulevard in the community of San Pedro in the southwestern portion of Los Angeles within the Port of Los Angeles Master Plan planning community in Los Angeles County. The project site is currently undeveloped and consists of Assessor's Parcel Numbers 7440-016-001, 7440-016-002, 7440-016-003, and 7412-024-007. The project site is bounded by Interstate 110 (I-110) to the north and west, John S. Gibson Boulevard to the east, and existing container terminals to the south. A portion of the project site is in the western portion of the Port of Los Angeles Master Plan Planning Area 2, which encompasses the West Basin and Wilmington areas. See Figure 1, Regional Project Location, and Figure 2, Site Plan, below.

The proposed project would construct a short-term trailer parking facility and related site improvements. The project would include paving of the site and striping of 393 trailer stalls. The 393 trailer stalls would be 11 feet (ft) by 40 ft and would occupy approximately 405,602 square feet (sq ft). In addition, the proposed project would include installation of a prefabricated guard booth and restroom for use by truck drivers and project employees.

Truck trailer parking operations were conservatively assumed to occur year-round, 24 hours a day, 7 days a week. Typical operational characteristics include truck trailer parking activities and a maximum of two employees providing security and operating onsite machinery.

The project would result in approximately 1,794 one-way truck trips per day, approximately 4 one-way delivery/vendor trips per day, and approximately 10 passenger vehicle trips per day. The parking lot is intended to support ship offloading and loading activities occurring at Port of Los Angeles container yards.

EXISTING LAND USES IN THE PROJECT AREA

The project site is surrounded primarily by office and industrial uses. The areas adjacent to the project site include the following uses:

- **North:** I-110 followed by industrial warehouses.
- **South and Southeast:** John S. Gibson Boulevard followed by container storage and terminal storage.
- **West and Southwest:** Harbor Community Police Station and Ports of America Office Building.

LSA

FIGURE 1

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MILE
SOURCE: EPD

John S. Gibson Trailer Lot POLA Project
Regional Project Location

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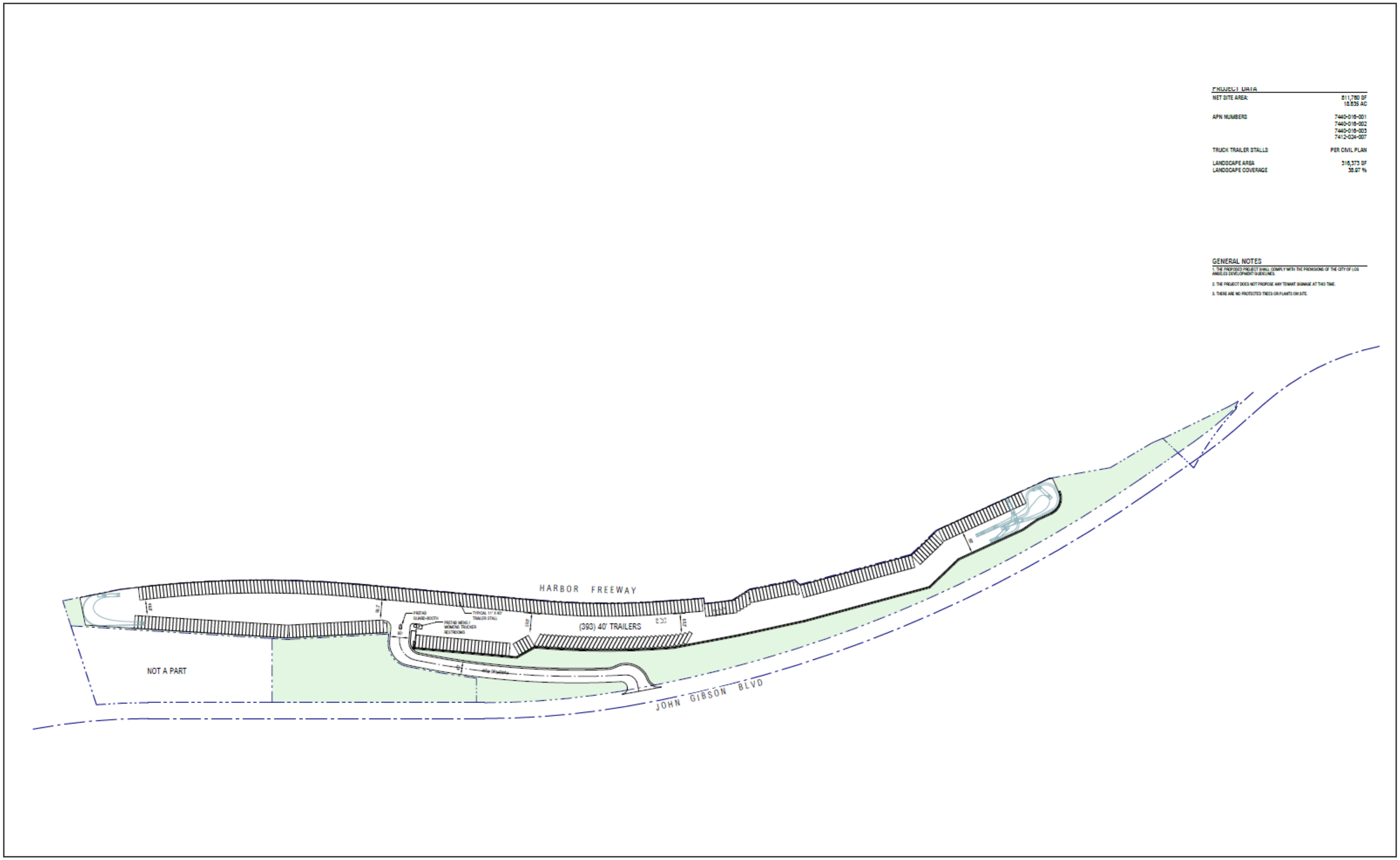

FIGURE 2

NO SCALE

SOURCE: RGA – Office of Architectural Design

John S. Gibson Trailer Lot POLA Project

Site Plan

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There are no nearby sensitive receptors within a 1,000 ft radius of the project site. The closest sensitive receptors to the project site are single-family homes located west of the project site at 1,366 ft from the western project site boundary line to the residences. The closest worker receptor to the project site is the Ports of America insurance company located immediately southwest at 25 ft from the project boundary.

NOISE AND VIBRATION FUNDAMENTALS

CHARACTERISTICS OF SOUND

Noise is usually defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, and sleep.

To the human ear, sound has two significant characteristics: pitch and loudness. Pitch is generally an annoyance, while loudness can affect the ability to hear. Pitch is the number of complete vibrations, or cycles per second, of a sound wave, which results in the tone's range from high to low. Loudness is the strength of a sound, and it describes a noisy or quiet environment; it is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound waves combined with the reception characteristics of the human ear. Sound intensity is the average rate of sound energy transmitted through a unit of area perpendicular to the direction in which the sound waves are traveling. This characteristic of sound can be precisely measured with instruments. The analysis of a project defines the noise environment of the project area in terms of sound intensity and its effect on adjacent sensitive land uses.

MEASUREMENT OF SOUND

Sound intensity is measured with the A-weighted decibel (dBA) scale to correct for the relative frequency response of the human ear. That is, an A-weighted noise level de-emphasizes low and very high frequencies of sound, similar to the human ear's de-emphasis of these frequencies. Decibels (dB), unlike the linear scale (e.g., inches or pounds), are measured on a logarithmic scale representing points on a sharply rising curve.

For example, 10 dB is 10 times more intense than 0 dB, 20 dB is 100 times more intense than 0 dB, and 30 dB is 1,000 times more intense than 0 dB. Thirty decibels (30 dB) represents 1,000 times as much acoustic energy as 0 dB. The decibel scale increases as the square of the change, representing the sound pressure energy. A sound as soft as human breathing is about 10 times greater than 0 dB. The decibel system of measuring sound gives a rough connection between the physical intensity of sound and its perceived loudness to the human ear. A 10 dB increase in sound level is perceived by the human ear as only a doubling of the sound's loudness. Ambient sounds generally range from 30 dB (very quiet) to 100 dB (very loud).

Sound levels are generated from a source, and their decibel level decreases as the distance from that source increases. Sound levels dissipate exponentially with distance from their noise sources. For a single point source, sound levels decrease approximately 6 dB for each doubling of distance from the source. This drop-off rate is appropriate for noise generated by stationary equipment. If noise is produced by a line source (e.g., highway traffic or railroad operations), the sound decreases 3 dB for each doubling of distance in a hard site environment. Line source sound levels decrease 4.5 dB for each doubling of distance in a relatively flat environment with absorptive vegetation.

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. The equivalent continuous sound level (L_{eq}) is the total sound energy of time-varying noise over a sample period. However, the predominant rating scales for human communities in the State of California are the L_{eq} and Community Noise Equivalent Level (CNEL) or the day-night average noise level (L_{dn}) based on A-weighted decibels. CNEL is the time-weighted average noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and a 10 dBA weighting factor applied to noises occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale but without the adjustment for events occurring during the relaxation. CNEL and L_{dn} are within 1 dBA of each other and are normally interchangeable. The City of Los Angeles uses the CNEL noise scale for long-term traffic noise impact assessment.

Other noise rating scales of importance when assessing the annoyance factor include the maximum instantaneous noise level (L_{max}), which is the highest sound level that occurs during a stated time period. The noise environments discussed in this analysis for short-term noise impacts are specified in terms of maximum levels denoted by L_{max}, which reflects peak operating conditions and addresses the annoying aspects of intermittent noise. It is often used together with another noise scale, or noise standards in terms of percentile noise levels, in noise ordinances for enforcement purposes. For example, the L_{10} noise level represents the noise level exceeded 10 percent of the time during a stated period. The L_{50} noise level represents the median noise level. Half the time the noise level exceeds this level, and half the time it is less than this level. The L_{90} noise level represents the noise level exceeded 90 percent of the time and is considered the background noise level during a monitoring period. For a relatively constant noise source, the L_{eq} and L_{50} are approximately the same.

Noise impacts can be described in three categories. The first category includes audible impacts, which are increases in noise levels noticeable to humans. Audible increases in noise levels generally refer to a change of 3 dB or greater because this level has been found to be barely perceptible in exterior environments. The second category, potentially audible, refers to a change in the noise level between 1 dB and 3 dB. This range of noise levels has been found to be noticeable only in laboratory environments. The last category includes changes in noise levels of less than 1 dB, which are inaudible to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant.

Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure to sound levels higher than 85 dBA. Exposure to high sound levels affects the entire system, with prolonged sound exposure in excess of 75 dBA increasing body tensions, thereby affecting blood pressure and functions of the heart and the nervous system. In comparison, extended periods of sound exposure above 90 dBA would result in permanent cell damage. When the sound level reaches 120 dBA, a tickling sensation occurs in the human ear, even with short-term exposure. This level of sound is called the threshold of feeling. As the sound reaches 140 dBA, the tickling sensation is replaced by a feeling of pain in the ear (i.e., the threshold of pain). A sound level of 160–165 dBA will result in dizziness or a loss of equilibrium. The ambient or background noise problem is widespread and generally more concentrated in urban areas than in outlying, less developed areas.

Table A lists definitions of acoustical terms, and Table B shows common sound levels and their sources.

Table A: Definitions of Acoustical Terms

Term	Definitions
Decibel, dB	A unit of sound measurement that denotes the ratio between two quantities that are proportional to power; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
Frequency, Hz	Of a function periodic in time, the number of times that the quantity repeats itself in 1 second (i.e., the number of cycles per second).
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. 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. (All sound levels in this report are A-weighted unless reported otherwise.)
L_{01}, L_{10}, L_{50}, L_{90}	The fast A-weighted noise levels that are equaled or exceeded by a fluctuating sound level 1%, 10%, 50%, and 90% of a stated time period, respectively.
Equivalent Continuous Noise Level, L_{eq}	The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time-varying sound.
Community Noise Equivalent Level, CNEL	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 5 dBA to sound levels occurring in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 dBA to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
Day/Night Noise Level, L_{dn}	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 dBA to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
L_{max}, L_{min}	The maximum and minimum A-weighted sound levels measured on a sound level meter, during a designated time interval, using fast time averaging.
Ambient Noise Level	The all-encompassing noise associated with a given environment at a specified time. Usually a composite of sound from many sources from many directions, near and far; no particular sound is dominant.

Source 1: *Technical Noise Supplement* (Caltrans 2013)
Source 2: *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).
Caltrans = California Department of Transportation
FTA = Federal Transit Administration

Table B: Common Sound Levels and Their Noise Sources

Noise Source	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Evaluations
Near Jet Engine	140	Deafening	128 times as loud
Civil Defense Siren	130	Threshold of Pain	64 times as loud
Hard Rock Band	120	Threshold of Feeling	32 times as loud
Accelerating Motorcycle at a Few Feet Away	110	Very Loud	16 times as loud
Pile Driver; Noisy Urban Street/ Heavy City Traffic	100	Very Loud	8 times as loud
Ambulance Siren; Food Blender	95	Very Loud	—
Garbage Disposal	90	Very Loud	4 times as loud
Freight Cars; Living Room Music	85	Loud	—
Pneumatic Drill; Vacuum Cleaner	80	Loud	2 times as loud
Busy Restaurant	75	Moderately Loud	—
Near Freeway Auto Traffic	70	Moderately Loud	Reference level
Average Office	60	Quiet	One-half as loud
Suburban Street	55	Quiet	—
Light Traffic; Soft Radio Music in Apartment	50	Quiet	One-quarter as loud
Large Transformer	45	Quiet	—
Average Residence without Stereo Playing	40	Faint	One-eighth as loud
Soft Whisper	30	Faint	—
Rustling Leaves	20	Very Faint	—
Human Breathing	10	Very Faint	Threshold of Hearing
—	0	Very Faint	—

Source: Compiled by LSA (2022).

FUNDAMENTALS OF VIBRATION

Vibration refers to ground-borne noise and perceptible motion. Ground-borne vibration is almost exclusively a concern inside buildings and is rarely perceived as a problem outdoors, where the motion may not be discernible, but without the effects associated with the shaking of a building there is less adverse reaction. Vibration energy propagates from a source through intervening soil and rock layers to the foundations of nearby buildings. The vibration then propagates from the foundation throughout the remainder of the structure. Building vibration may be perceived by occupants as the motion of building surfaces, the rattling of items sitting on shelves or hanging on walls, or a low-frequency rumbling noise. The rumbling noise is caused by the vibration of walls, floors, and ceilings that radiate sound waves. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by 10 dB or less. This is an order of magnitude below the damage threshold for normal buildings.

Typical sources of ground-borne vibration are construction activities (e.g., blasting, pile-driving, and operating heavy-duty earthmoving equipment), steel-wheeled trains, and occasional traffic on rough roads. Problems with both ground-borne vibration and noise from these sources are usually localized to areas within approximately 100 ft from the vibration source, although there are examples of ground-borne vibration causing interference out to distances greater than 200 ft (FTA 2018). When roadways are smooth, vibration from traffic, even heavy trucks, is rarely perceptible. It is assumed for most projects that the roadway surface will be smooth enough that ground-borne vibration from street traffic will not exceed the impact criteria; however, construction of the project could result in ground-borne vibration that may be perceptible and annoying.

Ground-borne noise is not likely to be a problem because noise arriving via the normal airborne path will usually be greater than ground-borne noise.

Ground-borne vibration has the potential to disturb people and damage buildings. Although it is very rare for train-induced ground-borne vibration to cause even cosmetic building damage, it is not uncommon for construction processes such as blasting and pile-driving to cause vibration of sufficient amplitudes to damage nearby buildings (FTA 2018). Ground-borne vibration is usually measured in terms of vibration velocity, either the root-mean-square (RMS) velocity or peak particle velocity (PPV). The RMS is best for characterizing human response to building vibration, and PPV is used to characterize the potential for damage. Decibel notation acts to compress the range of numbers required to describe vibration. Vibration velocity level in decibels is defined as:

$$L_v = 20 \log_{10} [V/V_{ref}]$$

where "L_v" is the vibration velocity in decibels (VdB), "V" is the RMS velocity amplitude, and "V_{ref}" is the reference velocity amplitude, or 1 x 10^{-6} inches/second (in/sec) used in the United States.

REGULATORY SETTING

APPLICABLE NOISE STANDARDS

The applicable noise standards governing the project site include the criteria in the City's Noise Element of the General Plan (Noise Element), the City's Municipal Code, and the *L.A. CEQA Thresholds Guide* (2006). The *L.A. CEQA Thresholds Guide* generally pulls information from both the Noise Element and the City's Municipal Code which are further described below.

City of Los Angeles

Noise Element of the General Plan

In California, cities and counties are required to adopt noise elements as part of their general plans. The purpose of a noise element is to establish a land use pattern that minimizes the exposure of residents of the community to excessive noise. The City of Los Angeles General Plan noise element provides planning guidance related to noise. It identifies goals, objectives, and an implementation program to ensure that Los Angeles residents will be protected from noise that may be detrimental to their physical and mental health and general welfare. In the noise element, the City has established an acceptable limit of noise exposure for various land use categories. The purpose of these criteria is to provide a guideline for the City to locate appropriate land uses within acceptable noise environments. Table C shows the City's land use compatibility standards for noise. Noise levels of 50 and 55 dBA CNEL are identified as being "normally acceptable" for single-family and multi-family residential land uses, respectively. Noise levels of 65 dBA CNEL are identified as being "normally acceptable" for office uses.

Municipal Code

Chapter XI of the Los Angeles Municipal Code establishes noise standards to limit noise affecting various land uses in the city. These standards apply to noise generated by "any machinery equipment, pump, fan, air-conditioning apparatus, or similar mechanical device." Table D summarizes the presumed ambient noise levels for various land use types as specified in Municipal Code Section 111.03.

Where the ambient noise level is less than the presumed ambient noise level designated, the presumed ambient noise level shall be deemed to be the minimum ambient noise level. At the boundary line between two zones, the presumed ambient noise level of the quieter zone shall be used. In accordance with the Noise Regulation, a noise level increase of 5 dBA over the existing average ambient noise level at an adjacent property line represents a noise violation.

Table C: City of Los Angeles Noise and Land Use Compatibility Guidelines

Land Use Category	Day-Night Average Exterior Sound Level (CNEL dB) 50	55	60	65	70	75	80
Residential Single Family, Duplex, Mobile Home	A	C	C	C	N	U	U
Residential Multi-Family	A	A	C	C	N	U	U
Transient Lodging, Motel, Hotel	A	A	C	C	N	U	U
School, Library, Church, Hospital, Nursing Home	A	A	C	C	N	N	U
Auditorium, Concert Hall, Ampitheater	C	C	C	C/N	U	U	U
Sports Arena, Outdoor Spectator Sports	C	C	C	C	C/U	U	U
Playground, Neighborhood Park	A	A	A	A/N	N	N/U	U
Golf Course, Riding Stable, Water Recreation, Cemetery	A	A	A	A	N	A/N	U
Office Building, Business, Commercial, Professional	A	A	A	A/C	C	C/N	N
Agriculture, Industrial, Manufacturing, Utilities	A	A	A	A	A/C	C/N	N

A = Normally acceptable. Specified land use is satisfactory, based upon assumption buildings involved are conventional construction, without any special noise insulation.

C = Conditionally acceptable. New construction or development only after a detailed analysis of noise mitigation is made and needed noise insulation features are included in project design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning normally will suffice.

N = Normally unacceptable. New construction or development generally should be discouraged. A detailed analysis of noise reduction requirements must be made and noise insulation features included in the design of a project.

U = Clearly unacceptable. New construction or development generally should not be undertaken.

Source: City of Los Angeles General Plan Noise Element (February 1999).
CNEL dB = Community Noise Equivalent Level in decibels

Table D: Exterior Presumed Ambient Noise Levels

Zone	Presumed Ambient Noise Level (dBA) Day	Night
A1, A2, RA, RE, RS, RD, RW1, RW2, R1, R2, R3, R4, and R5	50	40
P, PB, CR, C1, C1.5, C2, C4, C5, and CM	60	55
M1, MR1, and MR2	60	55
M2 and M3	65	65

Source: City of Los Angeles (2023).
dBA = A-weighted decibels

Chapter XI, Article 2, Section 112.05, Maximum Noise Level of Powered Equipment or Powered Hand Tools, requires that between the hours of 7:00 a.m. and 10:00 p.m., in any residential zone of the City or within 500 ft thereof, no person shall operate or cause to be operated any powered equipment or powered hand tool that produces a maximum noise level exceeding the following noise limits at a distance of 50 ft therefrom:

> (a) 75 dB(A) for construction, industrial, and agricultural machinery including crawler-tractors, dozers, rotary drills and augers, loaders, power shovels, cranes, derricks, motor graders, paving machines, off-highway trucks, ditchers, trenchers, compactors, scrapers, wagons, pavement breakers, compressors and pneumatic or other powered equipment;
>
> (b) 75 dB(A) for powered equipment of 20 HP or less intended for infrequent use in residential areas, including chain saws, log chippers and powered hand tools;
>
> (c) 65 dB(A) for powered equipment intended for repetitive use in residential areas, including lawn mowers, backpack blowers, small lawn and garden tools and riding tractors;

The noise limits for particular equipment listed above in (a), (b), and (c) shall be deemed to be superseded and replaced by noise limits for such equipment from and after their establishment by final regulations adopted by the United States Environmental Protection Agency (EPA) and published in the Federal Register.

However, the noise limitations above would not apply where compliance is deemed to be technically infeasible, which means that said noise limitations cannot be complied with despite the use of mufflers, shields, sound barriers, and/or other noise reduction device or techniques during the operation of the equipment. The aforementioned limitations apply only to uses in residential zones or within 500 ft thereof.

Chapter IV, Article 1, Section 41.40. Noise Due To Construction, Excavation Work – When Prohibited, states:

> (a) No person shall, between the hours of 9:00 p.m. and 7:00 a.m. of the following day, perform any construction or repair work of any kind upon, or any excavating for, any building or structure, where any of the foregoing entails the use of any power driven drill, riveting machine excavator or any other machine, tool, device or equipment which makes loud noises to the disturbance of persons occupying sleeping quarters in any dwelling hotel or apartment or other place of residence. In addition, the operation, repair or servicing of construction equipment and the job-site delivering of construction materials in such areas shall be prohibited during the hours herein specified. Any person who knowingly and willfully violates the foregoing provision shall be deemed guilty of a misdemeanor punishable as elsewhere provided in this Code.

(b) The provisions of Subsection (a) shall not apply to any person who performs the construction, repair or excavation work involved pursuant to the express written permission of the Board of Police Commissioners through its Executive Director. The Executive Director, on behalf of the Board, may grant this permission, upon application in writing, where the work proposed to be done is in the public interest, or where hardship or injustice, or unreasonable delay would result from its interruption during the hours mentioned above, or where the building or structure involved is devoted or intended to be devoted to a use immediately related to public defense. The provisions of this section shall not in any event apply to construction, repair, or excavation work done within any district zoned for manufacturing or industrial uses under the provisions of Chapter I of this Code, nor to emergency work necessitated by any flood, fire or other catastrophe.

(c) No person, other than an individual homeowner engaged in the repair or construction of his single-family dwelling shall perform any construction or repair work of any kind upon, or any earth grading for, any building or structure located on land developed with residential buildings under the provisions of Chapter I of this Code, or perform such work within 500 ft of land so occupied, before 8:00 a.m. or after 6:00 p.m. on any Saturday or national holiday nor at any time on any Sunday. In addition, the operation, repair or servicing of construction equipment and the job-site delivering of construction materials in such areas shall be prohibited on Saturdays and on Sundays during the hours herein specified. The provisions of this subsection shall not apply to persons engaged in the emergency repair of:

1. Any building or structure.
2. Earth supporting or endangering any building or structure.
3. Any public utility.
4. Any public way or adjacent earth

APPLICABLE VIBRATION STANDARDS

Federal Transit Administration

Because the City does not have vibration standards within their Noise Element, Municipal Code or the CEQA Thresholds Guide, vibration standards included in the FTA Manual are used in this analysis for ground-borne vibration impacts on human annoyance. The criteria for environmental impact from ground-borne vibration and noise are based on the maximum levels for a single event. Table E provides the criteria for assessing the potential for interference or annoyance from vibration levels in a building.

Table E: Interpretation of Vibration Criteria for Detailed Analysis

Land Use	Max L_v (VdB)[1]	Description of Use
Workshop	90	Vibration that is distinctly felt. Appropriate for workshops and similar areas not as sensitive to vibration.
Office	84	Vibration that can be felt. Appropriate for offices and similar areas not as sensitive to vibration.
Residential Day	78	Vibration that is barely felt. Adequate for computer equipment and low-power optical microscopes (up to 20×).
Residential Night and Operating Rooms	72	Vibration is not felt, but ground-borne noise may be audible inside quiet rooms. Suitable for medium-power microscopes (100×) and other equipment of low sensitivity.

Source: *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).
[1] As measured in 1/3-octave bands of frequency over the frequency range 8 to 80 hertz.
FTA = Federal Transit Administration
Max = maximum
L_V = velocity in decibels
VdB = vibration velocity decibels

Table F lists the potential vibration building damage criteria associated with construction activities, as suggested in the FTA Manual and adopted by the City's Noise Element. FTA guidelines show that a vibration level of up to 0.5 in/sec in PPV is considered safe for buildings consisting of reinforced concrete, steel, or timber (no plaster), and would not result in any construction vibration damage. For non-engineered timber and masonry buildings, the construction building vibration damage criterion is 0.2 in/sec in PPV.

Table F: Construction Vibration Damage Criteria

Building Category	PPV (in/sec)
Reinforced concrete, steel, or timber (no plaster)	0.50
Engineered concrete and masonry (no plaster)	0.30
Non-engineered timber and masonry buildings	0.20
Buildings extremely susceptible to vibration damage	0.12

Source: *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).
FTA = Federal Transit Administration
PPV = peak particle velocity
in/sec = inch/inches per second

OVERVIEW OF THE EXISTING NOISE ENVIRONMENT

The primary existing noise sources in the project area are traffic on I-110 and John S. Gibson Boulevard.

AMBIENT NOISE MEASUREMENTS

Long-Term Noise Measurements

To assess existing noise levels, LSA conducted two long-term noise measurements in the vicinity of the project site. The long-term (24-hour) noise level measurements were conducted on May 2 through May 3, 2023, using two Larson Davis Spark 706RC Dosimeters. Table G provides a summary of the measured hourly and maximum noise levels from the long-term noise level measurements. As shown in Table G, the calculated hourly noise levels are as low as 53.0 dBA L_{eq} during nighttime hours and 57.8 dBA L_{eq} during daytime hours. Noise measurement sheets are provided in Appendix A. Figure 3 shows the long-term monitoring locations.

Table G: Long-Term 24-Hour Ambient Noise Monitoring Results

Location		Daytime Noise Levels[1] (dBA L_{eq})	Evening Noise Levels[2] (dBA L_{eq})	Nighttime Noise Levels[3] (dBA L_{eq})	Average Daily Noise Levels (dBA CNEL)
LT-1	Northeast property line of 2001 John S. Gibson Blvd #1, San Pedro, CA 90731 on a fence bordering the project site.	57.8–61.3	56.4 – 58.7	53.0–60.2	63.9
LT-2	Northeast of John S. Gibson Boulevard and Harry Bridges Boulevard at a park near a tree.	67.1–71.2	65.9 – 67.9	63.0–67.7	72.4

Source: Compiled by LSA (2023).
Note: Noise measurements were conducted from May 2 to May 3, 2023, starting at 10:00 a.m.
[1] Daytime Noise Levels = noise levels during the hours of 7:00 a.m. to 7:00 p.m.
[2] Evening Noise Levels = noise levels during the hours of 7:00 p.m. to 10:00 p.m.
[3] Nighttime Noise Levels = noise levels during the hours of 10:00 p.m. to 7:00 a.m.
CNEL = Community Noise Equivalent Level
L_{eq} = equivalent continuous sound level
dBA = A-weighted decibels

EXISTING AIRCRAFT NOISE

Aircraft flyovers may be audible on the project site due to aircraft activity in the vicinity. The Torrance Municipal Airport is located approximately 3.8 miles northwest of the project site, and the Long Beach Airport is located approximately 7.6 miles northeast of the project site. The Los Angeles County Airport Land Use Plan (ALUC 2004) shows that the project site is outside the 65 dBA CNEL noise contour for the airports. While aircraft operations may contribute to the noise in the project area from these airports, the project site is not expected to experience airport-related noise levels in excess of the City's exterior standards. Impacts are considered less than significant, and no mitigation is required.

LSA

LEGEND

- Project Site Boundary
- Long-term Noise Monitoring Location

FIGURE 3

0 500 1000
FEET

SOURCE: Google Earth, 2023

John S. Gibson Trailer Lot

Noise Monitoring Locations

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PROJECT IMPACTS

SHORT-TERM CONSTRUCTION NOISE IMPACTS

Two types of short-term noise impacts could occur during the construction of the proposed project. First, construction crew commutes and the transport of construction equipment and materials to the site for the proposed project would incrementally increase noise levels on access roads leading to the site. Although there would be a relatively high single-event noise-exposure potential causing intermittent noise nuisance (passing trucks at 50 ft would generate up to 84 dBA L_{max}), the effect on longer-term ambient noise levels would be small when compared to existing daily traffic volumes on John S. Gibson Boulevard. The results of the California Emissions Estimator Model (CalEEMod) for the proposed project indicate that during the demolition phase, an additional 291 vehicles in passenger car equivalent (PCE) volume, consisting of worker and hauling trips, would be added to the roadway adjacent to the project site. Because the existing traffic volume on John S. Gibson Boulevard is approximately 18,425 (Los Angeles Department of Transportation 2017), construction-related vehicle trips would generate an approximate 0.1 dBA CNEL noise increase. A noise level increase of less than 3 dBA would not be perceptible to the human ear in an outdoor environment. Therefore, short-term, construction-related impacts associated with worker commute and equipment transport to the project site would be less than significant.

The second type of short-term noise impact is related to noise generated during construction, which includes site preparation, grading, paving, and architectural coating on the project site. Construction is completed in discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on the site and, therefore, the noise levels surrounding the site as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Table H lists typical construction equipment noise levels recommended for noise impact assessments, based on a distance of 50 ft between the equipment and a noise receptor, taken from the Federal Highway Administration's (FHWA) *FHWA Roadway Construction Noise Model* (2006).

In addition to the reference maximum noise level, the usage factor provided in Table H is used to calculate the hourly noise level impact for each piece of equipment based on the following equation:

$$L_{eq}(equip) = E.L. + 10\log(U.F.) - 20\log\left(\frac{D}{50}\right)$$

where: $L_{eq}(equip)$ = L_{eq} at a receiver resulting from the operation of a single piece of equipment over a specified time period.

E.L. = noise emission level of the particular piece of equipment at a reference distance of 50 ft.

U.F. = usage factor that accounts for the fraction of time that the equipment is in use over the specified period of time.

D = distance from the receiver to the piece of equipment.

Table H: Typical Construction Equipment Noise Levels

Equipment Description	Acoustical Usage Factor (%)[1]	Maximum Noise Level (L_{max}) at 50 ft[2]
Backhoes	40	80
Compressor	40	80
Dozers	40	85
Excavators	40	85
Flat Bed Trucks	40	84
Front-end Loaders	40	80
Graders	40	85
Paver	50	77
Pneumatic Tools	50	85
Pumps	50	77
Rollers	20	85
Scrapers	40	85
Tractors	40	84

Source: *FHWA Roadway Construction Noise Model* User's Guide, Table 1 (FHWA 2006).
Note: Noise levels reported in this table are rounded to the nearest whole number.
1 Usage factor is the percentage of time during a construction noise operation that a piece of construction equipment is operating at full power.
2 Maximum noise levels were developed based on Specification 721.560 from the Central Artery/Tunnel program to be consistent with the City of Boston's Noise Code for the "Big Dig" project.
FHWA = Federal Highway Administration
ft = foot/feet
L_{max} = maximum instantaneous sound level

Each piece of construction equipment operates as an individual point source. Using the following equation, a composite noise level can be calculated when multiple sources of noise operate simultaneously:

$$Leq\ (composite) = 10 * \log_{10}\left(\sum_{1}^{n} 10^{\frac{Ln}{10}}\right)$$

Using the equations from the methodology above, the reference information in Table H, and the construction equipment list provided, the composite noise level of each construction phase was calculated. The project construction composite noise levels at a distance of 50 ft would range from 74 dBA L_{eq} to 88 dBA L_{eq}, with the highest noise levels occurring during the site preparation and grading phases.

Once composite noise levels are calculated, reference noise levels can then be adjusted for distance using the following equation:

$$Leq\ (at\ distance\ X) = Leq\ (at\ 50\ feet) - 20 * \log_{10}\left(\frac{X}{50}\right)$$

In general, this equation shows that doubling the distance would decrease noise levels by 6 dBA while halving the distance would increase noise levels by 6 dBA.

Table I shows the nearest sensitive residential uses, to the project site, their distance from the construction activities, and composite noise levels expected during construction. These noise level projections do not consider intervening topography or barriers. Construction equipment calculations are provided in Appendix B.

Table I: Potential Construction Noise Impacts at Nearest Receptor

Receptor (Location)	Composite Noise Level at 50 ft[1] (dBA L_{eq})	Distance from Center of Construction Activities (ft)	Composite Noise Level (dBA L_{eq})
Residences (West)	88	1,366	60

Source: Compiled by LSA (2023).

1 The composite construction noise level represents the site preparation and grading phases which are expected to result in the greatest noise level as compared to other phases.

dBA L_{eq} = average A-weighted hourly noise level

ft = foot/feet

While construction noise will vary, it is expected that composite noise levels during construction at the nearest sensitive uses to the west would reach 60 dBA L_{eq} during daytime hours. These predicted noise levels would only occur when all construction equipment is operating simultaneously and, therefore, are assumed to be rather conservative in nature. While construction-related short-term noise levels have the potential to be higher than existing ambient noise levels in the project area under existing conditions, the noise impacts would no longer occur once project construction is completed.

As stated above, the City's Noise Ordinance regulates noise impacts associated with construction activities. The proposed project would comply with the construction hours specified in the City's Noise Ordinance, which states that construction activities are not allowed between the hours of 9 p.m. and 7 a.m. on any given day. The code also prohibits noise from construction equipment within 500 ft of a residential zone before 8 a.m. or after 6 p.m. on any Saturday or national holiday nor at any time on any Sunday.

As it relates to off-site uses, construction-related noise impacts would remain well below the 75 dBA construction noise level criteria for daytime construction noise level criteria as established by the City for residential uses in Chapter XI, Article 2, Section 112.05 of the Municipal Code; therefore, the impact would be considered less than significant.

SHORT-TERM CONSTRUCTION VIBRATION IMPACTS

This construction vibration impact analysis discusses the level of human annoyance using vibration levels in RMS (VdB) and assesses the potential for building damages using vibration levels in PPV (in/sec). This is because vibration levels calculated in RMS are best for characterizing human response to building vibration, while vibration levels calculated in PPV are best for characterizing potential for damage.

Table J shows the PPV and VdB values at 25 ft from the construction vibration source. As shown in Table J, bulldozers and other heavy-tracked construction equipment (expected to be used for this project) generate approximately 0.089 PPV in/sec or 87 VdB of ground-borne vibration when measured at 25 ft, based on the FTA Manual. The distance to the nearest buildings for vibration impact analysis is measured between the nearest off-site buildings and the project construction boundary (assuming the construction equipment would be used at or near the project setback line).

Table J: Vibration Source Amplitudes for Construction Equipment

Equipment	Reference PPV/L_V at 25 ft	
	PPV (in/sec)	L_V (VdB)[1]
Large Bulldozer	**0.089**	**87**
Loaded Trucks	**0.076**	**86**

Source: *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).
[1] RMS vibration velocity in decibels (VdB) is 1 µin/sec.
µin/sec = microinches per second
ft = foot/feet
FTA = Federal Transit Administration
in/sec = inch/inches per second
L_V = velocity in decibels
PPV = peak particle velocity
RMS = root-mean-square
VdB = vibration velocity decibels

The formulae for vibration transmission are provided below, and Tables K and L, below, provide a summary of off-site construction vibration levels.

$$L_v dB\ (D) = L_v dB\ (25\ ft) - 30\ Log\ (D/25)$$

$$PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$$

Table K: Potential Construction Vibration Annoyance Impacts at Nearest Receptor

Receptor (Location)	Reference Vibration Level (VdB) at 25 ft[1]	Distance (ft)[2]	Vibration Level (VdB)[3]
Industrial (North)	87	200	53
Industrial (South and Southeast)		275	49
Office (Southwest)		25	80
Residences (West)		1,366	28

Source: Compiled by LSA (2023).
[1] The reference vibration level is associated with a large bulldozer, which is expected to be representative of the heavy equipment used during construction.
[2] The reference distance is associated with the average condition, identified by the distance from the edge of construction activities to surrounding uses.
[3] Includes a conservative 7 dB coupling loss for 1-2 story heavy structures.
ft = foot/feet
VdB = vibration velocity decibels

Table L: Potential Construction Vibration Damage Impacts at Nearest Receptor

Receptor (Location)	Reference Vibration Level (PPV) at 25 ft[1]	Distance (ft)[2]	Vibration Level (PPV)
Industrial (North)	0.089	200	0.004
Industrial (South and Southeast)		275	0.002
Office (Southwest)		25	0.089
Residences (West)		1,366	<0.001

Source: Compiled by LSA (2023).

[1] The reference vibration level is associated with a large bulldozer, which is expected to be representative of the heavy equipment used during construction.

[2] The reference distance is associated with the peak condition, identified by the distance from the perimeter of construction activities to surrounding structures.

ft = foot/feet

PPV = peak particle velocity in inches per second

As shown in Table E, above, the threshold at which vibration levels would result in annoyance would be 78 VdB for daytime residential uses and 84 VdB for office uses. As also shown in Table F, the FTA guidelines indicate that for a non-engineered timber and masonry building, the construction vibration damage criterion is 0.2 in/sec in PPV.

Based on the information provided in Table K, vibration levels are expected to approach 80 VdB at the closest office use to the southwest and 28 VdB at the closest residence to the west and would not exceed the annoyance thresholds.

Based on the information provided in Table L, vibration levels are expected to approach 0.089 PPV in/sec at the nearest surrounding structures and would be below the 0.2 PPV in/sec damage threshold. Other building structures surrounding the project site are farther away and would experience further reduced vibration. The impact would be considered less than significant, and no construction vibration impacts would occur. No vibration reduction measures are required.

Because construction activities are regulated by the City's Municipal Code, which states that construction activities are not allowed between the hours of 9 p.m. and 7 a.m. on any given day, vibration impacts would not occur during the more sensitive nighttime hours.

LONG-TERM OFF-SITE TRAFFIC NOISE IMPACTS

The guidelines included in the FHWA Highway Traffic Noise Prediction Model (FHWA-RD-77 108) were used to evaluate highway traffic-related noise conditions along roadway segments in the project vicinity. This model requires various parameters, including traffic volumes, vehicle mix, vehicle speed, and roadway geometry, to compute typical equivalent noise levels during daytime, evening, and nighttime hours. The resultant noise levels are weighted and summed over 24-hour periods to determine the CNEL values. Table N provides the traffic noise levels for the opening year (2025) with and without project scenarios, and horizon year (2040) with and without project scenarios. These noise levels represent the worst-case scenario, which assumes no shielding is provided between the traffic and the location where the noise contours are drawn.

The without and with project scenario traffic volumes were obtained from the *Traffic Impact Analysis for Port of Los Angeles John Gibson Container Parking Lot Project* (EPD Solutions Inc. 2023). Appendix C provides the specific assumptions used in developing these noise levels and model printouts. Table M shows that the increase in project-related traffic noise would be no greater than 1.3 dBA. Noise level increases of 3.0 dBA are considered barely perceptible to the human ear. Therefore, traffic noise impacts from project-related traffic on off-site sensitive receptors would be less than significant and no mitigation measures are required.

LONG-TERM TRAFFIC-RELATED VIBRATION IMPACTS

The proposed project would potentially generate vibration levels related to on-site operations. Vibration levels generated from project-related traffic on the adjacent roadways are unusual for on-road vehicles because the rubber tires and suspension systems of on-road vehicles provide vibration isolation. Based on a reference vibration level of 0.076 in/sec PPV for a loaded truck, as shown in Table K, structures greater than 20 ft from the project site boundary or roadways that contain project trips would experience vibration levels below the most conservative standard of 0.12 in/sec PPV; therefore, vibration levels generated from project-related traffic on the adjacent roadways and to surrounding buildings would be less than significant, and no mitigation measures are required.

LONG-TERM OFF-SITE STATIONARY NOISE IMPACTS

Parking Lot Truck Activities

Adjacent off-site land uses would be potentially exposed to stationary-source noise impacts from the proposed parking lot activities. The potential noise impacts to off-site sensitive land uses from the proposed operational activities are discussed below.

Noise levels generated by delivery trucks would be similar to noise readings from trucks during the parking process, which generate a noise level of 76.3 dBA L_8 at 20 ft based on measurements taken by LSA (*Operational Noise Impact Analysis for Richmond Wholesale Meat Distribution Center* [LSA 2016]). During this process, noise levels are associated with the truck engine noise, air brakes, and back-up alarms while the truck is backing into the parking space. These noise levels would occur for a shorter period of time (less than 5 minutes). To present a conservative assessment, it is assumed that truck arrivals and departure activities could occur at 20 spaces in a given hour.

Noise levels generated by 20 trucks would equate to 89.3 dBA L_{eq}. While it is possible that one truck event could occur at a closer distance to surrounding uses, because the 20 truck movements are assumed to be spread over the project site in an average or typical condition, the center of the site is considered an appropriate average distance from which to assess potential impacts. At an average distance of 3,500 ft to the nearest sensitive uses to the west, noise levels would approach 39.4 dBA L_{eq}, which would not exceed the City's daytime and nighttime standards of 50 dBA L_{eq} and 40 dBA L_{eq}, respectively. Similarly, at an average distance of 1,475 ft to the nearest office use to the southwest, noise levels would approach 52 dBA L_{eq}, which would not exceed the City's daytime and nighttime standards of 60 dBA L_{eq} and 55 dBA L_{eq}, respectively. Therefore, noise levels generated by truck activities would meet the City's noise standards for stationary sources, and no mitigation would be required.

Table M: Traffic Noise Levels Without and With Proposed Project

Roadway Segment	Opening Year 2025 – Without Project		Opening Year 2025 – With Project			Horizon Year 2040 – Without Project		Horizon Year 2040 – With Project		
	ADT	CNEL (dBA) 50 ft from Centerline of Nearest Lane	ADT	CNEL (dBA) 50 ft from Centerline of Nearest Lane	Increase from Existing Conditions (dBA)	ADT	CNEL (dBA) 50 ft from Centerline of Nearest Lane	ADT	CNEL (dBA) 50 ft from Centerline of Nearest Lane	Increase from Existing Conditions (dBA)
John S. Gibson Boulevard	11,510	65.0	14,422	66.0	1.0	14,570	66.1	19,966	67.4	1.3

Source: Compiled by LSA (October 2023).
ADT = average daily traffic
CNEL= Community Noise Equivalent Level
dBA = A-weighted decibels
ft = foot/feet

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APPENDIX A

NOISE MONITORING DATA

Noise Measurement Survey – 24 HR

Project Number: ESL2201.63
Test Personnel: Kevin Nguyendo
Project Name: Port of LA truck Lot
Equipment: Spark 706RC (SN:908)

Site Number: LT-1 Date: 5/2/23
Time: From 10:00 a.m. To 10:00 a.m.

Site Location: Northeast of the Yang Ming shipping company on 2001 John S Gibson Blvd #1, San Pedro, CA 90731 on a fence bordering the project site.

Primary Noise Sources: Vehicle traffic noise on John S Gibson Boulevard and the I-110 Freeway. Port activity noise such as cranes and distant truck loading sounds.

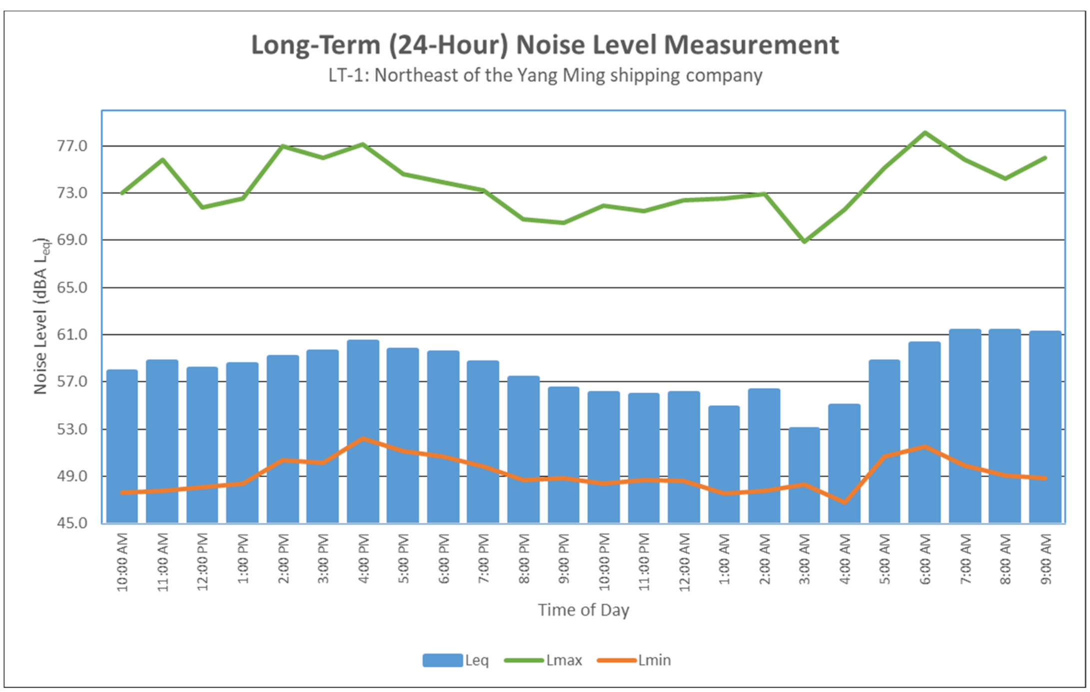
Comments:

Photo:

Long-Term (24-Hour) Noise Level Measurement Results at LT-1

Start Time	Date	Noise Level (dBA)		
		L_{eq}	L_{max}	L_{min}
10:00 AM	5/2/23	57.8	73.0	47.6
11:00 AM	5/2/23	58.7	75.8	47.8
12:00 PM	5/2/23	58.1	71.8	48.1
1:00 PM	5/2/23	58.5	72.5	48.4
2:00 PM	5/2/23	59.1	77.0	50.4
3:00 PM	5/2/23	59.5	76.0	50.1
4:00 PM	5/2/23	60.4	77.1	52.2
5:00 PM	5/2/23	59.7	74.6	51.1
6:00 PM	5/2/23	59.5	73.9	50.7
7:00 PM	5/2/23	58.7	73.2	49.8
8:00 PM	5/2/23	57.3	70.8	48.7
9:00 PM	5/2/23	56.4	70.5	48.8
10:00 PM	5/2/23	56.1	71.9	48.4
11:00 PM	5/2/23	55.8	71.5	48.7
12:00 AM	5/3/23	56.0	72.4	48.6
1:00 AM	5/3/23	54.8	72.5	47.5
2:00 AM	5/3/23	56.3	72.9	47.8
3:00 AM	5/3/23	53.0	68.9	48.3
4:00 AM	5/3/23	55.0	71.6	46.8
5:00 AM	5/3/23	58.7	75.1	50.7
6:00 AM	5/3/23	60.2	78.1	51.5
7:00 AM	5/3/23	61.3	75.8	49.9
8:00 AM	5/3/23	61.3	74.2	49.1
9:00 AM	5/3/23	61.2	76.0	48.8

Source: Compiled by LSA Associates, Inc. (2023).
dBA = A-weighted decibel
L_{eq} = equivalent continuous sound level
L_{max} = maximum instantaneous noise level
L_{min} = minimum measured sound level



Noise Measurement Survey – 24 HR

Project Number: ESL2201.63
Project Name: Port of LA Truck Lot

Test Personnel: Kevin Nguyendo
Equipment: Spark 706RC (SN:119)

Site Number: LT-2 Date: 5/2/23

Time: From 10:00 a.m. To 10:00 a.m.

Site Location: Northeast of John S Gibson Boulevard and Harry Bridges Boulevard at a park Near a tree.

Primary Noise Sources: Vehicle traffic noise on at the intersection of John S Gibson Boulevard and Harry Bridges Boulevard.

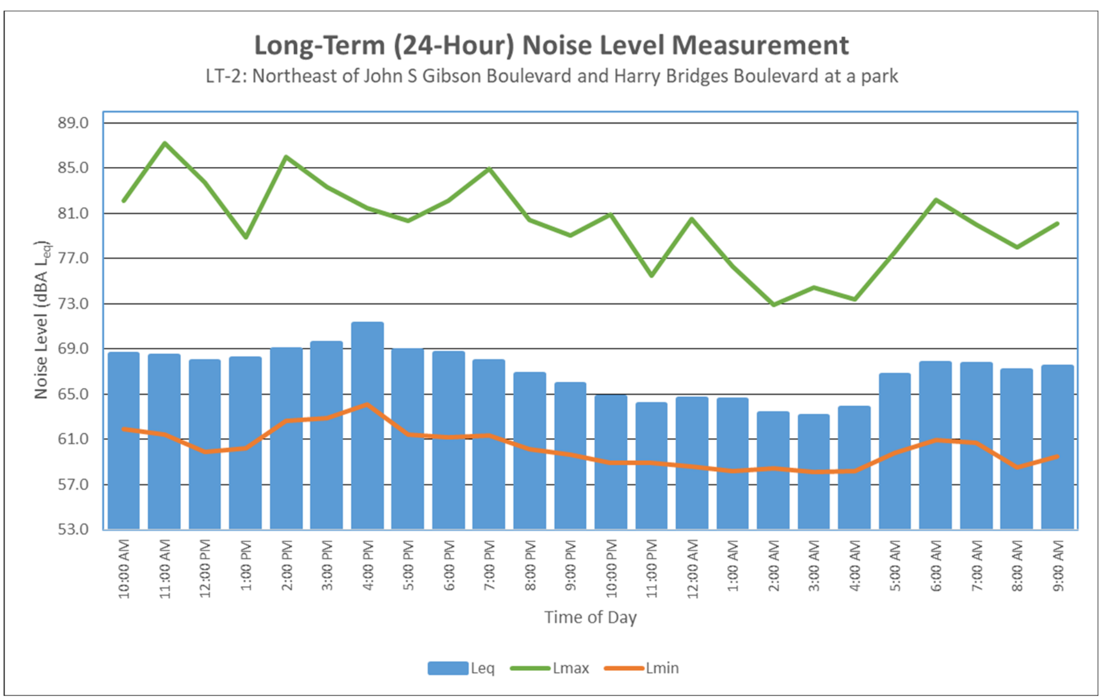
Comments:

Photo:

Long-Term (24-Hour) Noise Level Measurement Results at LT-2

Start Time	Date	Noise Level (dBA)		
		L_{eq}	L_{max}	L_{min}
10:00 AM	5/2/23	68.6	82.1	61.9
11:00 AM	5/2/23	68.4	87.2	61.4
12:00 PM	5/2/23	67.9	83.7	59.9
1:00 PM	5/2/23	68.1	78.9	60.2
2:00 PM	5/2/23	68.9	86.0	62.6
3:00 PM	5/2/23	69.5	83.3	62.9
4:00 PM	5/2/23	71.2	81.5	64.1
5:00 PM	5/2/23	68.9	80.3	61.4
6:00 PM	5/2/23	68.6	82.1	61.2
7:00 PM	5/2/23	67.9	84.9	61.3
8:00 PM	5/2/23	66.7	80.4	60.1
9:00 PM	5/2/23	65.9	79.0	59.6
10:00 PM	5/2/23	64.7	80.9	58.9
11:00 PM	5/2/23	64.1	75.5	58.9
12:00 AM	5/3/23	64.5	80.5	58.6
1:00 AM	5/3/23	64.5	76.3	58.2
2:00 AM	5/3/23	63.3	72.9	58.4
3:00 AM	5/3/23	63.0	74.4	58.1
4:00 AM	5/3/23	63.8	73.4	58.2
5:00 AM	5/3/23	66.7	77.6	59.8
6:00 AM	5/3/23	67.7	82.2	60.9
7:00 AM	5/3/23	67.7	80.0	60.7
8:00 AM	5/3/23	67.1	78.0	58.5
9:00 AM	5/3/23	67.4	80.1	59.5

Source: Compiled by LSA Associates, Inc. (2023).
dBA = A-weighted decibel
L_{eq} = equivalent continuous sound level
L_{max} = maximum instantaneous noise level
L_{min} = minimum measured sound level



APPENDIX B

CONSTRUCTION NOISE LEVEL CALCULATIONS

Construction Calculations

Phase: Site Preparation

Equipment	Quantity	Reference (dBA) 50 ft Lmax	Usage Factor[1]	Distance to Receptor (ft)	Ground Effects	Noise Level (dBA)	
						Lmax	Leq
Tractor	4	84	40	50	0.5	84	86
Dozer	3	82	40	50	0.5	82	83
					Combined at 50 feet	**86**	**88**
					Combined at Receptor 1366 feet	**57**	**59**

Phase: Grading

Equipment	Quantity	Reference (dBA) 50 ft Lmax	Usage Factor[1]	Distance to Receptor (ft)	Ground Effects	Noise Level (dBA)	
						Lmax	Leq
Grader	1	85	40	50	0.5	85	81
Scraper	2	84	40	50	0.5	84	83
Dozer	1	82	40	50	0.5	82	78
Tractor	2	84	40	50	0.5	84	83
Excavator	2	81	40	50	0.5	81	80
					Combined at 50 feet	**90**	**88**
					Combined at Receptor 1366 feet	**62**	**60**

Phase:Paving

Equipment	Quantity	Reference (dBA) 50 ft Lmax	Usage Factor[1]	Distance to Receptor (ft)	Ground Effects	Noise Level (dBA)	
						Lmax	Leq
Paver	2	77	50	50	0.5	77	77
All Other Equipment > 5 HP	2	85	50	50	0.5	85	85
Roller	2	80	20	50	0.5	80	76
					Combined at 50 feet	**87**	**86**
					Combined at Receptor 1366 feet	**58**	**57**

Phase:Architectural Coating

Equipment	Quantity	Reference (dBA) 50 ft Lmax	Usage Factor[1]	Distance to Receptor (ft)	Ground Effects	Noise Level (dBA)	
						Lmax	Leq
Compressor (air)	1	78	40	50	0.5	78	74
					Combined at 50 feet	**78**	**74**
					Combined at Receptor 1366 feet	**49**	**45**

Sources: RCNM

[1]- Percentage of time that a piece of equipment is operating at full power.
dBA – A-weighted Decibels
Lmax- Maximum Level
Leq- Equivalent Level

APPENDIX C

FHWA TRAFFIC NOISE MODEL PRINTOUTS

TABLE Opening Year 2025 - Without Project-01

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/18/2023
ROADWAY SEGMENT: John S. Gibson Boulevard
NOTES: John S. Gibson Trailer Lot Project - Opening Year 2025 - Without Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11510   SPEED (MPH): 40   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 35   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.04

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	85.6	249.6	782.1

TABLE Opening Year 2025 - With Project-01

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/18/2023
ROADWAY SEGMENT: John S. Gibson Boulevard
NOTES: John S. Gibson Trailer Lot Project - Opening Year 2025 - With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 14422   SPEED (MPH): 40   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 35   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.02

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	104.0	311.6	979.6

TABLE Horizon Year 2040 - Without Project - 01

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/18/2023
ROADWAY SEGMENT: John S. Gibson Boulevard
NOTES: John S. Gibson Trailer Lot Project - Horizon Year 2040 - Without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 14570   SPEED (MPH): 40   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 35   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.06

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	104.9	314.7	989.7

TABLE Horizon Year 2040 - With Project -01

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/18/2023
ROADWAY SEGMENT: John S. Gibson Boulevard
NOTES: John S. Gibson Trailer Lot Project - Horizon Year 2040 - With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 19966 SPEED (MPH): 40 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 35 SITE CHARACTERISTICS: HARD

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.43

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	140.0	430.0	1355.8
