3.8 NOISE

This section describes the existing noise conditions of the Globemaster Corridor Specific Plan (GCSP; Proposed Project) site and vicinity, identifies associated regulatory requirements, and evaluates potential noise impacts related to implementation of the Proposed Project. The following discussion focuses on the existing noise setting in the City of Long Beach (City) and more specifically, the Plan Area.

The Initial Study (IS) and Notice of Preparation (NOP) are contained in Appendix A-1, Initial Study; and Appendix A-2, Notice of Preparation, respectively. No comments pertaining to noise were received in response to the NOP (see Appendix A-3, Notice of Preparation Comment Letters).

The IS found that the Proposed Project would have a potentially significant impact as it relates to noise (Appendix A-1). As such, all impacts will be addressed further in this Draft Program Environmental Impact Report (PEIR)/Draft Program Environmental Impact Statement (PEIS).

3.8.1 Existing Conditions

Noise Characteristics

Sound may be described in terms of level or amplitude (measured in decibels [dB]), frequency or pitch (measured in hertz [Hz] or cycles per second), and duration (measured in seconds or minutes). The standard unit of measurement of the amplitude of sound is the decibel. Because the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale is used to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against low and very high frequencies in a manner approximating the sensitivity of the human ear. Table 3.8-1, Typical Sound Levels in the Environment and Industry, provides examples of A-weighted noise levels from common sounds.

Table 3.8-1
Typical Sound Levels in the Environment and Industry

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
—	110	Rock band
Jet flyover at 300 meters (1,000 feet)	100	—
Gas lawn mower at 1 meter (3 feet)	90	—
Diesel truck at 15 meters (50 feet), at 80 kph (50 mph)	80	Food blender at 1 meter (3 feet) Garbage disposal at 1 meter (3 feet)
Noisy urban area, daytime gas lawn mower at 30 meters (100 feet)	70	Vacuum cleaner at 3 meters (10 feet)
Commercial area Heavy traffic at 90 meters (300 feet)	60	Normal speech at 1 meter (3 feet)

Table 3.8-1
Typical Sound Levels in the Environment and Industry

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Quiet urban daytime	50	Large business office Dishwasher, next room
Quiet urban nighttime	40	Theater, large conference room (background)
Quiet suburban nighttime	30	Library
Quiet rural night time	20	Bedroom at night, concert hall (background)
—	10	Broadcast/recording studio
Lowest threshold of human hearing	0	Lowest threshold of human hearing

Source: Caltrans 2013a.
kph = kilometers per hour; mph = miles per hour

Noise is defined as unwanted sound, and is known to have several adverse effects on people, including hearing loss, speech interference, sleep interference, physiological responses, and annoyance. Based on these known adverse effects of noise, the federal government, the State of California, and local agencies have established criteria to protect public health and safety, to prevent disruption of certain human activities, and to minimize annoyance.

Several descriptors of noise (noise metrics) exist to help predict average community reactions to the adverse effects of environmental noise, including traffic-generated noise, on a community. These descriptors include the equivalent noise level over a given period (L_{eq}), the day–night average noise level (L_{dn}), and the community noise equivalent level (CNEL). Each of these descriptors uses units of dBA.

L_{eq} is a sound energy level averaged over a specified time period (usually 1 hour). L_{eq} is a single numerical value that represents the amount of variable sound energy received by a receptor during a time interval. For example, a 1-hour L_{eq} measurement would represent the average amount of energy contained in all the noise that occurred in that 1 hour. L_{eq} is an effective noise descriptor because of its ability to assess the total time-varying effects of noise on sensitive receptors. L_{max} is the greatest sound level measured during a designated time interval or event.

Unlike the L_{eq} metric, L_{dn} and CNEL metrics always represent 24-hour periods, usually on an annualized basis. L_{dn} and CNEL also differ from L_{eq} because they apply a time-weighted factor designed to emphasize noise events that occur during the evening and nighttime hours (when speech and sleep disturbance is of more concern). “Time weighted” refers to the fact that L_{dn} and CNEL penalize noise that occurs during certain sensitive periods. In the case of CNEL, noise occurring during the daytime (7:00 a.m.–7:00 p.m.) receives no penalty. Noise during the evening (7:00 p.m.–10:00 p.m.) is penalized by adding 5 dBA, and nighttime (10:00 p.m.–7:00 a.m.) noise is penalized by adding 10 dBA. L_{dn} differs from CNEL in that the daytime period is defined as 7:00 a.m.–10:00 p.m., thus eliminating the evening period. L_{dn} and CNEL are the predominant criteria used to measure roadway noise affecting residential receptors. These two metrics generally differ from one another by no more than 0.5 to 1 dBA.

Vibration Characteristics

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration can be a serious concern, causing buildings to shake and rumbling sounds to be heard. In contrast to noise, vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of vibration are trains, buses on rough roads, and construction activities, such as blasting, pile driving, and heavy earth-moving equipment.

Several different methods are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings and is usually measured in inches per second. The root mean square amplitude is most frequently used to describe the effect of vibration on the human body and is defined as the average of the squared amplitude of the signal. Decibel notation (VdB) is commonly used to measure root mean square. The decibel notation acts to compress the range of numbers required to describe vibration (Caltrans 2013b).

High levels of vibration may cause physical personal injury or damage to buildings. However, vibration levels rarely affect human health. Instead, most people consider vibration to be an annoyance that can affect concentration or disturb sleep. In addition, high levels of vibration can damage fragile buildings or interfere with equipment that is highly sensitive to vibration (e.g., electron microscopes). Most perceptible indoor vibration is caused by sources within buildings, such as operation of mechanical equipment, movement of people, or slamming of doors. Typical outdoor sources of perceptible vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If the roadway is smooth, the vibration from traffic is rarely perceptible (Caltrans 2013b).

Sensitive Receptors

Noise- and vibration-sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would be considered noise- and vibration-sensitive land uses (NSLU) and may warrant unique measures for protection from intruding noise and vibration.

The GCSP boundary is adjacent to residential neighborhoods that are generally west of Cherry Avenue and north of East 32nd Street. These represent the nearest noise-sensitive residential land uses with the potential to be impacted by future projects under the GCSP. The southwestern portion of the City of Lakewood is also near the northern boundary of the Plan Area, with apparent medium/high-density residential uses proximate to Deeboyar Avenue and north of Carson Street, and low-density residential uses north of Greenmeadow Road in the same vicinity. Additional

noise-sensitive receptors considered in this noise impact assessment include the following educational and healthcare facilities:

- Burroughs Elementary School (on East 33rd Street in Signal Hill, between Orange Avenue and Gundry Avenue)
- Westerly School of Long Beach (East 29th Street)
- DeVry University (Kilroy Airport Way)
- Keller Graduate School of Management – Long Beach Center (Kilroy Airport Way)
- HealthCare Partners Urgent Care (2600 Redondo Avenue)
- Pediatric Medical Center (2921 Redondo Avenue, within the Plan Area)

Nearly one-half-mile south of the Plan Area, the Long Beach neighborhood of Sunrise has residential land uses immediately south of Willow Street that are unlikely to be affected by any new stationary noise sources associated with future projects under the GCSP; however, the community may be exposed to increases in project-attributed traffic noise, and as such, this community is included in this impact assessment on that basis.

Additionally, James Madison Elementary School (Paramount Boulevard and Bomberry Street in the City of Lakewood) is approximately 1,800 feet northeast of the northern extent of the Proposed Project, and is thus, also unlikely to experience significant impact from stationary noise sources associated with the Proposed Project. With respect to potential traffic noise impact, this area of Lakewood is north of Carson Street, which is studied in this assessment.

Existing Noise Conditions

The Plan Area is located in an urbanized environment and is subject to typical urban noises, such as noise generated by traffic, stationary noise sources and day-to-day outdoor activities. The predominant noise sources include transportation routes and major stationary sources associated with commercial and industrial land uses. “Transportation noise” typically refers to noise from automobile use, trucking, aircraft, and rail operations. “Stationary noise” typically refers to noise from sources such as heating, ventilation, and air conditioning (HVAC) systems, compressors, power generators, landscape maintenance equipment, and on-site construction activities or machinery associated with local industrial or commercial activities. To quantify the existing outdoor ambient sound environment that encompasses all these sources and to help characterize dominant acoustical contributors, a field survey of sound pressure levels (SPL) was performed and is summarized in the following section.

Ambient Noise Measurements

Noise level measurements were performed near the Plan Area at a total of nine representative locations on November 13, 2018 and December 11, 2018 to quantify the existing outdoor sound environment. Figure 3.8-1, Outdoor Ambient Sound Level Survey Locations, presents these measurement locations with respect to the Plan Area. Table 3.8-2 provides the geographic location (or address), date, and time the SPL measurements were taken. The noise level measurements were made using a Piccolo Sound Level Meter (Serial Numbers [SN] 130625008 and 140317004), which are integrating sound level meters equipped with a 0.5-inch pre-polarized condenser microphone with a pre-amplifier. This type of sound level meter (SLM) meets the current American National Standards Institute (ANSI) standard for a Type 2 (general purpose) SLM. Each SLM had its calibration status checked in the field before and after the measurements, and the measurements were conducted with the microphone positioned approximately five feet above the ground.

During the field survey, observations of the physical settings, environmental conditions, and predominant (audible and/or witnessed) noise sources were noted. Counts of observed vehicles, differentiated by type, were also made at each location as shown in Table 3.8-2. The major noise source at all surveyed representative locations was from traffic noise along local roadways. Other secondary noise sounds commonly included distant traffic noise, rustling leaves, birds, barking dogs, distant aircraft, distant conversations, and other community noises (e.g., sounds from gardening and landscaping activities).

Additionally, the City of Long Beach Existing Conditions Report (ECR) for the General Plan Noise Element Update (City of Long Beach 2018) presents SPL measurements of the outdoor sound environment, performed as recently as May 2017, at a variety of locations that include 256 East Vernon Street in the vicinity of the Sunrise neighborhood (approximately 3,800 feet from the Plan Area). According to these outdoor ambient noise level measurements presented in the City of Long Beach ECR, the measured daytime SPL at this representative community location ranged from 57 to 65 dBA L_{eq} over a two-day period, with an average CNEL of 62 dBA (City of Long Beach 2018).

Establishing Baseline Traffic Noise

The City of Long Beach ECR includes estimates of roadway traffic noise throughout the municipality, based on predictive modeling that used 2017 traffic data available from the Southern California Association of Governments (SCAG). At roadway segments nearest to the measurement locations shown in Table 3.8-2 and Figure 3.8-1, Figure 3 (Area 10) from the City of Long Beach ECR shows that estimated day-night sound level (L_{dn}) values range from 65 to 75 dBA, depending on distance to the roadway centerline (City of Long Beach 2018). This L_{dn} range is generally consistent with the measured L_{eq} value range appearing in Table 3.8-2, assuming the measured

daytime sample L_{eq} values approximate L_{dn} values per Federal Transit Administration (FTA) guidance (FTA 2006), and helps support (along with field observation during the survey) the assertion that roadway traffic noise is the dominant source of measured outdoor ambient sound. Hence, for purposes of this analysis, the measured L_{eq} presented in Table 3.8-2, Measured Outdoor Ambient Noise Levels and Counted Vehicles by Type, or as otherwise referenced herein represents the traffic noise baseline level with respect to roadway segments near the Proposed Project and upon which future conditions will be assessed.

Table 3.8-2
Measured Outdoor Ambient Noise Levels and Counted Vehicles by Type

Survey Tag (ST)	Location/Address	Date	Time	L_{eq}[1] (dBA)	Cars	MT[2]	HT[3]	Bus	MC[4]
1	North of 1802 E Carson St Long Beach, CA 90807	November 13, 2018	09:04 AM to 09:19 AM	75.5	311	6	0	1	2
2	East of 3731 Cherry Ave Long Beach, CA 90807	November 13, 2018	10:12 AM to 10:27 AM	71.8	577	17	15	2	4
3	North of 1840 E 36th St Long Beach, CA 90807	November 13, 2018	11:00 Am to 11:30 AM	62.7	46	0	0	0	0
4	South of 3402 Gaviota Ave Long Beach, CA 90807	November 13, 2018	11:46 AM to 12:01 PM	71.2	156	1	1	1	2
5	South of 3301 Falcon Ave Signal Hill, CA 90755	November 13, 2018	12:18 PM to 12:48 PM	62.5	47	1	0	0	0
6	East of 3323 Walnut Ave Signal Hill, CA 90755	November 13, 2018	12:59 PM to 01:19 PM	66.7	98	2	2	0	0
7	Southwest boundary of Boeing facility	November 13, 2018	01:37 PM to 02:07 PM	60.6	41	1	2	0	0
8	West of 3888 Cherry Ave Long Beach, CA 90807	November 13, 2018	09:39 AM to 09:54 AM	77.1	514	20	6	2	5
9	East Spring Street, approx. 250' east of intersection with California Avenue	December 11, 2018	11:37 AM to 11:52 AM	76.6	343	9	12	0	0

Source: Dudek 2018
1 Equivalent continuous sound level (time-average sound level) in A-weighted decibels
2 Medium Truck
3 Heavy Truck
4 Motorcycle

3.8.2 Regulatory Setting

Federal

Consistent with Section 2 of the City of Long Beach Draft ECR for the General Plan Noise Element Update (City of Long Beach 2018), there are no federal regulations related to noise that would apply to this Proposed Project. However, the FTA offers guidance on assessment of noise and vibration in its *Transit Noise and Vibration Impact Assessment* manual (FTA 2006). The FTA vibration impact criteria, expressed as vibration velocity decibels (VdB) are used in this analysis to assess ground-borne vibration impacts with respect to human annoyance. For instance, for residences and other buildings where people typically sleep (hospitals or lodging), 80 VdB would be considered the threshold for "infrequent" vibration events, defined as fewer than seventy (70) events per day.

State

Government Code Section 65302(g)

California Government Code Section 65302(g) requires the preparation of a Noise Element in a General Plan, which shall identify and appraise the noise problems in the community. The Noise Element shall recognize the guidelines adopted by the Office of Noise Control in the State Department of Health Services and shall quantify, to the extent practicable, current and projected noise levels for the following sources:

- Highways and freeways
- Primary arterials and major local streets
- Passenger and freight on-line railroad operations and ground rapid transit systems
- Aviation and airport-related operations
- Local industrial plants
- Other ground stationary noise sources contributing to the community noise environment.

California General Plan Guidelines

The California General Plan Guidelines, published by the Governor's Office of Planning and Research (OPR), provides guidance for the acceptability of specific land use types within areas of specific noise exposure. Table 3.8-3, Land Use Compatibility for Community Noise Environments, presents guidelines for determining acceptable and unacceptable community noise exposure limits for various land use categories. The guidelines also present adjustment factors that may be used to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of

the relative importance of noise pollution. OPR guidelines are advisory in nature. Local jurisdictions, including the City of Long Beach, have the responsibility to set specific noise standards based on local conditions.

Table 3.8-3
Land Use Compatibility for Community Noise Environments

	Community Noise Exposure (dBA CNEL)			
	Normally Acceptable[1]	*Conditionally Acceptable*[2]	*Normally Unacceptable*[3]	*Clearly Unacceptable*[4]
Residential-low density, single-family, duplex, mobile homes	50–60	55–70	70–75	75–85
Residential – multiple-family	50–65	60–70	70–75	75–85
Transit lodging – motel, hotels	50–65	60–70	70–80	80–85
Schools, libraries, churches, hospitals, nursing homes	50–70	60–70	70–80	80–85
Auditoriums, concert halls, amphitheatres	NA	50–70	NA	65–85
Sports arenas, outdoor spectator sports	NA	50–75	NA	70–85
Playgrounds, neighborhood parks	50–70	NA	67.5–77.5	72.5–85
Golf courses, riding stables, water recreation, cemeteries	50–70	NA	70–80	80–85
Office buildings, business commercial and professional	50–70	67.5–77.5	75–85	NA
Industrial, manufacturing, utilities, agriculture	50–75	70–80	75–85	NA

Source: OPR 2017.
CNEL = community noise equivalent level; NA = not applicable
1 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.
2 Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features have been included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.
3 Normally Unacceptable: New construction or development should be discouraged. If new construction of development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise-insulation features must be included in the design.
4 Clearly Unacceptable: New construction or development should generally not be undertaken.

California Airport Land Use Requirements

The Los Angeles County Airport Land Use Commission (ALUC) has adopted an Airport Environs Land Use Plan (AELUP) for Los Angeles County airports including Long Beach Airport. The AELUP criteria for sensitive land uses is 65 dB CNEL for outdoor areas and 45 dB CNEL for indoor areas of residential land uses.

For newly-developed nonresidential indoor occupied spaces falling within the airport 65 dBA CNEL aviation noise contour, the California Green Building Standards Code (a.k.a., “CalGreen”) require a 50 dBA hourly L_{eq} threshold on exterior-to-interior noise intrusion (CalGreen 2018).

Local

City of Lakewood General Plan Noise Element

The City of Lakewood Noise Element (1996) identifies noise sources and policies to reduce noise impacts that are a common source of complaints. Many of the goals and implementation programs address efforts to reduce noise impacts from adjacent roadways, railroad rights-of-way, and the Long Beach Airport. Special noise regulations concerning construction are included in the City's Municipal Code.

Goal 1: Maintain or reduce noise levels throughout the city.

> **Policy1.1:** Ensure that new and expanded commercial projects do no generate adverse noise impacts on adjacent residential areas.
>
> **Policy 1.3:** Integrate noise reduction techniques in building plan review process.

City of Lakewood Municipal Code

The City of Lakewood Municipal Code (LMC) includes Section 4240 of Part 4 (Conduct in General), which requires "No person shall make, cause or suffer, or permit to be made upon any premises owned, occupied or controlled by him any unnecessary noises or sounds which are physically annoying to persons of ordinary sensitiveness or which are so harsh or so prolonged or unnatural or unusual in their use, time, or place as to occasion physical discomfort to the inhabitants of any neighborhood." (City of Lakewood 2019).

LMC Section 9376.1 sets a limit of 65 dBA (i.e., up to 5 dB greater than 60 dBA) for noise due to operating machinery (e.g., pumps, fans, air-conditioning) at the property line of a residential use.

LMC Section 8019 limits hours of construction from 7:00 a.m. to 7:00 p.m. on Mondays through Saturdays, and 9:00 a.m. to 7:00 p.m. on Sundays., or as allowed by the Section 8020 of the City of Lakewood Municipal Code.

City of Long Beach General Plan Noise Element

The City of Long Beach Noise Element considers the impacts from producers of stationary noise with standards as shown in Table 3.8-4, City of Long Beach General Plan Recommended Criteria for Maximum Acceptable Noise Levels in A-Weighted Decibels (dBA) (as reproduced from Table 11 in the Noise Element [1975]).

Table 3.8-4
City of Long Beach General Plan Recommended Criteria for Maximum Acceptable Noise Levels[1] in A-Weighted Decibels (dBA)

Major Land Use Type	Stationary Source Land Use Noise Standards			
	Outdoor Maximum Single Hourly Peak	*Outdoor L_{10}* [2]	*Outdoor L_{50}* [3]	*Indoor L_{dn}* [4]
Residential[5] (7:00 AM to 10:00 PM)	70	55	45	45
Residential[5] (10:00 PM to 7:00 AM)	60	45	35	35
Commercial (anytime)	75	65	55	n/a[6]
Industrial (anytime)	85	70	60	n/a[6]

Source: City of Long Beach, General Plan Noise Element (1975), Table 11.

1 Based on existing ambient level ranges in Long Beach and recommended U.S. Environmental Protection Agency ratios and standards for interference and annoyance.

2 Noise level exceeded ten percent (10%) of the time.

3 Noise level exceeded fifty percent (50%) of the time.

4 Day-night average sound level. The 24-hour A-weighted equivalent sound level with a 10-decibel penalty applied to nighttime levels.

5 Includes all residential categories and all nose-sensitive land uses (e.g., hospitals and schools).

6 Since different types of commercial and industrial activities appear to be associated with different noise levels, identification of a maximum indoor level for activity interference is unfeasible.

With respect to construction noise, the City of Long Beach ECR refers to FTA Transit Noise and Vibration Impact Assessment (FTA 2006) general assessment guidance for applicable thresholds, which are a one-hour 90 dBA L_{eq} for residential land uses and 100 dBA hourly L_{eq} for commercial and industrial uses.

For consideration of transportation noise changes attributed to the Proposed Project and for the purposes of this noise assessment, the City of Long Beach ECR describes "audible impacts" as being increases in noise level that people can notice, and would be represented quantitatively by a change greater than 3 dB.

City of Long Beach Noise Regulations

The City of Long Beach has adopted a quantitative Noise Control Ordinance ("noise ordinance", LBMC Chapter 8.80), which sets forth all noise regulations controlling unnecessary, excessive, and annoying noise and vibration in Long Beach. As outlined in Section 8.80.150 of the LBMC, maximum exterior noise levels are based on land use districts. The Long Beach Noise Control Ordinance also governs the time of day that construction work can be conducted. Section 8.80.202 of the noise ordinance prohibits construction, drilling, repair, alteration, or demolition work between the hours of 7:00 p.m. and 7:00 a.m. on weekdays, between the hours of 7:00 p.m. on Friday and 9:00 a.m. on Saturday, and after 6:00 p.m. on Saturday, or at any time on Sundays or federal holidays unless allowed by the Long Beach Noise Control Officer (City of Long Beach 2020). Table 3.8-5, City of Long Beach Maximum Noise Criteria, summarizes the exterior sound level criteria from LBMC Section 8.80.160.

Table 3.8-5
City of Long Beach Exterior Noise Limits

Receiving Land Use District	Hourly Noise Criteria (dBA L_{eq})	
	Daytime (7:00 AM to 10:00 PM)	*Nighttime (10:00 PM to 7:00 AM)*
District One — Predominantly residential with other land use types also present	50	45
District Two — Predominantly commercial with other land use types also present	60	55
District Three — Predominantly industrial with other land use types also present [1]	65	65
District Four — Predominantly industrial with other land types use also present [1]	70	70
District Five — Airport, freeways, and waterways regulated by other agencies	Regulated by other agencies and laws	

Source: City of Long Beach 2020.
[1] Districts Three and Four limits are intended primarily for use at their boundaries rather than for noise control within those districts.

City of Signal Hill General Plan Noise Element

The City of Signal Hill Noise Element (City of Signal Hill 2009) provides guidance for the control of noise to protect residents, workers, and visitors from potentially adverse noise impacts. The City of Signal Hill has adopted local guidelines based on the community noise compatibility guidelines established by the California Department of Health Services for use in assessing the compatibility of various land use types with a range of noise levels (Refer to Table 3.8-3, Land Use Compatibility for Community Noise Environments). The City of Signal Hill established the standards identified in Table 3.8.6, City of Signal Hill Noise Compatibility Criteria by Land Use, as the primary tools to ensure compatibility between land uses and outdoor ambient noise.

Table 3.8-6
City of Signal Hill Noise Compatibility Criteria by Land Use

Land Use	Compatibility Criteria
Residential	
Exterior	Outdoor living areas must be mitigated to 65 dB CNEL or less.
Interior	Habitable rooms must be mitigated to 45 dB CNEL or less
Other Noise Sensitive Uses	
Exterior	Same as residential criterion.
Interior	Same as residential criterion
Commercial	
Exterior	A noise level of 70 dB CNEL or less, or one that does not interfere with normal business activity
Industrial	
Exterior	A noise level of 75 dB CNEL or less, or one that does not interfere with normal business activity.
	Public access areas should be 65 dB CNEL or less.

Source: Table 8, Noise Compatibility Criteria by Land Use, City of Signal Hill 2009.

The Signal Hill Noise Element includes the following policies that are applicable to potential noise impacts of projects:

Goal 1: Protect the health, safety, and welfare of people living and working within the city from adverse noise impacts.

> **Policy 1.a:** The City will consider the severity of noise exposure in the community planning process to prevent or minimize noise impacts to existing and proposed land uses.
>
> **Policy 1.d:** The City will inform those living and working within the city of the effects of noise pollution and will cooperate with all levels of government to reduce or minimize impacts.
>
> **Policy 1.e:** Require noise mitigation to ensure that noise-sensitive land uses are not exposed to noise levels of greater than 45 dB in habitable rooms and 65 dB in outdoor living areas.

The City of Signal Hill Noise Ordinance from Chapter 9.16 of the Signal Hill Municipal Code (SHMC) establishes noise limit standards on a variety of activities and sources that include building construction, vehicular, and industrial noise. The City of Signal Hill Noise Element also acknowledges that the City of Long Beach has implemented an Airport Noise Compatibility Ordinance (Chapter 16.43, Long Beach Municipal Code) that limits noise for neighborhoods in both Signal Hill and Long Beach. In summary, the Airport Noise Compatibility Ordinance includes: establishment of a Single Event Noise Exposure Level (SENEL) standard (for non-governmental aircraft operating at the Long Beach Airport), with standards varying per runway location and time of day. Lower SENEL values are expected during evening and nighttime hours.

City of Signal Hill Noise Regulation

SHMC Section 9.16.060 sets a stationary source noise limit of no more than 5 dB over the existing outdoor ambient noise level. Where not measured, SHMC Section 9.16.020 presumes the outdoor ambient base noise level is a fixed value that varies with zone as shown in Table 3.8-7, City of Signal Hill Presumed Ambient Base Noise Level.

Table 3.8-7
City of Signal Hill Presumed Ambient Base Noise Level

Zone	Ambient Base Noise Level (dBA)	
	Daytime (7:00 AM to 10:00 PM)	*Nighttime (10:00 PM to 7:00 AM)*
Residential	60	50
Commercial	65	60
Industrial	70	70

Source: City of Signal Hill 2018.

Thus, and by way of example, the threshold for stationary operating noise sources such as HVAC equipment as received by a residential zone would be 55 dBA L_{eq} at night, or as modified by the following decibel adjustments per SHMC 9.16.060.A:

- Noise persists for more than five minutes out of any one hour – no adjustment
- Noise persists for more than one minute but not more than five minutes out of any one hour – subtract 5 dB
- Noise persists for one minute or less out of any one hour – subtract 10 dB
- Add one and only one of the following corrections for unusual character:
  - Noise has no unusual character – no adjustment
  - Noise contains a piercing pure tone – add 5 dB
  - Noise is impulsive or rattling in nature – add 5 dB
  - Noise carries speech, music, or other information content – add 5 dB

Per SHM 9.16.050, construction activities are permitted in Signal Hill on weekdays between 7:00 a.m. and 6:00 p.m., or as allowed by the City of Signal Hill building official.

Vibration Standards

The California Environmental Quality Act (CEQA) states that the potential for any excessive ground-borne noise and vibration levels must be analyzed; however, it does not define the term "excessive" vibration. Numerous public and private organizations and governing bodies have provided guidelines to assist in the analysis of ground-borne noise and vibration. The City of Long Beach ECR references the FTA vibration velocity thresholds for building damage risk impacts due to ground-borne vibration. Per Section 8.80.200 of the LBMC, device operation vibration is limited to a human perception threshold of 0.001 g of acceleration from 0-30 Hertz (Hz) and 0.003 g between 30 and 100 Hz. These vibration acceleration values translate into 0.002 inches/second and 0.008 inches/second for vibration at 30 Hz.

3.8.3 Thresholds of Significance

The following significance criteria, included in Appendix G of the State CEQA Guidelines (14 CCR 15000 et seq.), will determine the significance of a noise impact. Impacts related to noise would be significant if the Proposed Project would:

A. Generate of 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.

B. Generate of excessive groundborne vibration or groundborne noise levels.

C. 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, expose people residing or working in the project area to excessive noise levels.

The IS found that the Proposed Project would have a potentially significant impact as it relates to noise (Appendix A-1). As such, all impacts will be addressed further in this Draft Program Environmental Impact Report (PEIR)/Draft Program Environmental Impact Statement (PEIS).

For each of the three above-listed criteria, the Initial Study estimated that impacts would be potentially significant. Quantitative thresholds of significance have been established for the purposes of this analysis based on the local polices and regulations described in Section 3.8.2, Regulatory Setting. These thresholds are listed below.

- For residential noise-sensitive receptors located in the City of Long Beach, the noise limits for stationary sources of noise are 50 dBA L_{eq} during daytime hours (7 a.m. to 10 p.m.) and 45 dBA L_{eq} at night (7 a.m. to 10 p.m.).
- For residential noise-sensitive receptors located in the City of Signal Hill, the noise limit for stationary sources of noise is that they cause no more than a 5 dB increase above the existing ambient noise level, which is presumed to be (i.e., if not measured or otherwise quantified) 60 dBA during the daytime hours and 50 dBA at night per SHMC Section 9.16.020 as shown in Table 3.8-7.
- At the property lines of residential noise-sensitive receptors located in the City of Lakewood per LMC 9376.1, the noise limit for stationary sources of noise is 65 dBA.
- Consistent with the City of Long Beach ECR definition of an "audible impact", off-site noise impacts due to project-attributed traffic would be considered significant if the project-generated traffic causes an increase of 3 dB or more above existing traffic noise levels.
- Consistent with the City of Long Beach ECR, a daytime 90 dBA hourly L_{eq} (with 80 dBA at night) at residential NSLU and 100 dBA hourly L_{eq} (anytime) applies for construction noise.
- Per the City of Long Beach ECR, the range of vibration threshold perception ranges from 0.008 to 0.012 inches/second; however, with respect to the potential for building damage risk, the City of Long Beach ECR refers to Federal Transit Administration (FTA) guidance that suggests 0.2 inch per second as an impact threshold for "non-engineered timber and masonry," which could reasonably describe most residential uses in the vicinity of the Proposed Project.

3.8.4 Impacts Analysis

a) 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?

On-site noise-generating activities and sources associated with the Proposed Project would include successive (and sometimes concurrent) short-term construction projects, as well as long-term operations (due to introduction of new stationary noise-producing sources, such as HVAC systems, and changes to transportation). These potential effects are analyzed below.

Construction Noise (Short-Term Impacts)

Construction noise and vibration are temporary phenomena. Construction noise and vibration levels vary from hour to hour and day to day, depending on the equipment in use, the operations being performed, and the distance between the source and receptor.

The Proposed Project is expected to involve the creation of landscaped areas as part of street improvements on existing streets such as Cherry Avenue, and a variety of demolition and construction activities associated with individual projects in various planned zones across the GCSP. The future implementation pattern and timing of land use development projects which could be allowed under the Proposed Project remain speculative; hence, there is no reliable method of estimating which future developments might be under construction simultaneously. As such, the following general assessment is appropriate as a programmatic level of review for this type of project.

Equipment that would be in operation during construction would include excavators, backhoes, scrapers, forklifts, compressors, paving equipment, and haul trucks. According to FTA guidance, the typical maximum noise levels for various pieces of construction equipment at a distance of 50 feet range from 76 to 88 dBA L_{max}. Typically, construction equipment operates in alternating cycles of full power and low power, producing time-averaged noise levels less than these presented maximum noise levels. Nonetheless, impacts were conservatively evaluated assuming the highest value (88 dBA) of this maximum noise level range.

Consistent with the FTA-based general assessment technique that assumes the two loudest pieces of construction equipment on site are operating at full power (and thus individually generating noise at L_{max} values), the logarithmic sum of 91 dBA at 50 feet would represent expected construction noise. With sound attenuating from a point source at approximately 6 dB per doubling of distance, and conservatively neglecting additional attenuation due to

atmospheric absorption and porous ground cover, or the potential noise-reducing benefit of intervening structures, NSLU within 60 feet of a construction site could be affected by noise levels over 90 dBA. NSLU along the west side of Cherry Avenue could be located within this impacted distance. But for NSLU that are more distant from expected Proposed Project construction areas, such as the Westerly School of Long Beach (approximately 600 feet from the southern GCSP boundary, across the Interstate 405 highway), received construction noise would be much lower in magnitude and not anticipated to reach significantly impactful levels.

Although these nearby off-site residences would be exposed to elevated construction noise levels, the exposure would be short-term, and would cease upon completion of project construction. Further, the City of Long Beach, the City of Lakewood, and the City of Signal Hill generally limit construction activity to daytime hours. However, circumstances might create the opportunity (as allowed by the municipality proximate to the activity) for nighttime construction noise to occur outside of normally permitted hours. Under such conditions, and using the City of Long Beach as an example, the City of Long Beach ECR refers to an FTA-based general assessment guidance limit of 90 dBA hourly L_{eq} during daytime hours for construction noise. The same FTA guidance indicates that at night, the applicable threshold would be 80 dBA hourly L_{eq} (FTA 2006); hence, the impact distance during nighttime hours expands to 180 feet (i.e., from the acoustic emission point within the construction site representing the concurrently operating two pieces of equipment) and would potentially expose more NSLU to adverse noise effects.

On this basis, noise impacts from construction are considered potentially significant. Excessive noise occurrence in the overnight period results in the greatest potential impact to NSLU, via sleep disruption. Mitigation measure **MM-NOI-1**, which prohibits construction in the overnight period, addresses the single most important aspect of construction noise impact. Mitigation measure **MM-NOI-2** aims to reduce the maximum construction noise levels experienced at NSLU, bringing the noise levels more in alignment with the magnitude of traffic noise along major roadways in the community. Construction noise would consequently remain noticeable at nearby residences, but likely would not be a substantial irritant on the basis of it having a magnitude and character (e.g., operating fuel-burning engines) comparable to pre-existing roadway traffic.

CEQA Impact Determination

The suite of controls required as part of mitigation measures **MM-NOI-1** and **MM-NOI-2**, if implemented properly, is expected to result in a reduction of maximum construction noise levels in the range of 10-15 dBA (especially if a temporary sound barrier is installed and obscures line-of-sight between the construction activity noise source(s) and the

sensitive receptor of concern). Therefore, temporary construction-related noise impacts would be a **less than significant impact with mitigation incorporated** under CEQA.

NEPA Impact Determination

The suite of controls required as part of mitigation measures **MM-NOI-1** and **MM-NOI-2**, if implemented properly, is expected to result in a reduction of maximum construction noise levels in the range of 10-15 dBA (especially if a temporary sound barrier is installed and obscures line-of-sight between the construction activity noise source(s) and the sensitive receptor of concern). Therefore, temporary construction-related noise would result in **no adverse effect** under NEPA.

Operational Noise (Long-Term Impacts)

The primary off-site noise-related effect that future development under the Proposed Project could have is an increase in proximate roadway traffic, which is the main source of noise in most areas. As such, the following analysis discusses off-site roadway noise effects.

Future developments under the Proposed Project would generate traffic along various arterial roadways. For the purposes of this analysis, increases in traffic noise would be considered significant when they cause an increase of 3 dB or more compared to existing noise levels at the nearest NSLU to the studied roadway segment, which are listed below:

- Carson Street (west of Cherry Avenue) – residences south of Carson St.;
- Carson Street (east of Shopping Center) – residences in Lakewood north of Carson St.;
- Cherry Avenue (north of Cover Street) – residences west of Cherry Ave.;
- Cherry Avenue (south of Bixby Road) – residences west of Cherry Ave.;
- 36th Street (west of Cherry Avenue) – residences west of Cherry Ave.;
- East Wardlow Road (west of Cherry Avenue) – residences north of E. Wardlow Rd.;
- Spring Street (east of California Avenue) – planned new community open space south of Spring St.;
- Kilroy Airport Way (south of Spring Street) – school buildings (DeVry University and Keller School of Management) east of Kilroy Airport Way;
- Orange Avenue (north of 32nd Street) – nearby school (Burroughs Elementary); and,
- Willow Street (west of California Avenue) – residences south of Willow St.

Assuming the proportion of vehicle types on a roadway segment, and the vehicle speeds, remain comparable between an existing and a future scenario, traffic noise varies logarithmically with traffic volume. For example, traffic noise would be expected to rise by 3 dB if the traffic volume doubled under these conditions. Using both existing and future projections of peak hour traffic volumes from the Traffic Impact Analysis (TIA, LLG 2020) for representative roadway segments nearest to the NSLU where existing outdoor noise levels were measured, Table 3.8-8, Predicted Increases in Traffic Noise (over Existing) Attributed to the Proposed Project, presents anticipated increases in existing traffic noise levels due to addition of traffic volumes from the Proposed Project.

Table 3.8-8
Predicted Increases in Traffic Noise (over Existing) Attributed to the Proposed Project

Roadway Segment	Existing Daytime L_{eq} (dBA)[1]	Existing Morning Peak Hour Traffic Volume (vehicles)	Existing Afternoon Peak Hour Traffic Volume (vehicles)	Existing + Proposed Project Morning Peak Hour Traffic Volume (vehicles)	Existing + Proposed Project Afternoon Peak Hour Traffic Volume (vehicles)	Estimated Increase in Morning Outdoor Ambient Sound Level (dB)	Estimated Increase in Afternoon Outdoor Ambient Sound Level (dB)
Carson Street (west of Cherry Avenue)	75	1686	2119	1680	2107	-0.02	-0.02
Carson Street (east of Shopping Center)	75	2265	2727	2262	2718	-0.01	-0.01
Cherry Avenue (north of Cover Street)	77	2665	2868	3581	3942	1.28	1.38
Cherry Avenue (south of Bixby Road)	72	3185	3570	4101	4644	1.10	1.14
36th Street (west of Cherry Avenue)	63	126	235	126	235	0.00	0.00
East Wardlow Road (west of Cherry Avenue)	71	865	1074	1324	1582	1.85	1.68
Spring Street (east of California Avenue)	77	1674	2054	1722	2118	0.12	0.13
Kilroy Airport Way (south of Spring Street)	n/a	771	773	771	773	0.00	0.00
Orange Avenue (north of 32nd Street)	62	1313	1434	1364	1533	0.17	0.29
Willow Street (west of California Avenue)	62	2577	2849	2696	3002	0.20	0.23

Source: LLG 2020, Dudek 2018.

[1] Representative, from measured sound pressure level (see Table 3.8-2) nearest to indicated roadway segment in proximity to NSLU.

Table 3.8-9, Predicted Increases in Traffic Noise (over Year 2040) Attributed to the Proposed Project, provides a similar traffic noise increase analysis, but with respect to the anticipated 2040 Year traffic volumes and the expected change due to the Proposed Project.

Table 3.8-9
Predicted Increases in Traffic Noise (over Year 2040) Attributed to the Proposed Project

Roadway Segment	Year 2040 Morning Peak Hour Traffic Volume (vehicles)	Year 2040 Afternoon Peak Hour Traffic Volume (vehicles)	Year 2040 + Proposed Project Morning Peak Hour Traffic Volume (vehicles)	Year 2040 + Proposed Project Afternoon Peak Hour Traffic Volume (vehicles)	Estimated Increase in Morning Outdoor Ambient Sound Level (dB)	Estimated Increase in Afternoon Outdoor Ambient Sound Level (dB)
Carson Street (west of Cherry Avenue)	1774	2231	1768	2219	-0.01	-0.02
Carson Street (east of Shopping Center)	2409	2897	2406	2888	-0.01	-0.01
Cherry Avenue (north of Cover Street)	2830	3043	3746	4117	1.22	1.31
Cherry Avenue (south of Bixby Road)	3387	3793	4303	4867	1.04	1.08
36th Street (west of Cherry Avenue)	126	235	126	235	0.00	0.00
East Wardlow Road (west of Cherry Avenue)	865	1074	1324	1582	1.85	1.68
Spring Street (east of California Avenue)	1759	2156	1807	2220	0.12	0.13
Kilroy Airport Way (south of Spring Street)	771	773	771	773	0.00	0.00
Orange Avenue (north of 32nd Street)	1383	1508	1434	1607	0.16	0.28
Willow Street (west of California Avenue)	2729	3017	2848	3170	0.19	0.21

Source: LLG 2020.
[1] Representative, from measured sound pressure level (see Table 3.8-2) nearest to indicated roadway segment in proximity to NSLU.

As shown in Tables 3.8-8 and 3.8-9, future project-attributed changes to traffic volumes at the studied roadway segments near NSLU would result in traffic noise level increase of less than 2 dB, and therefore, below the significance threshold of 3 dB. Further, the Proposed Project would comply with all jurisdictions along public right-of-way areas. Therefore, traffic related to future development and street improvements under the Proposed Project would not substantially increase the existing noise levels in the vicinity,

and there would be **no impact** from operational traffic-related noise. **No mitigation is required** for off-site traffic noise.

Warehousing is already included as an expected industrial land use as part of the TIA, and thus, the future roadway segment volumes presented in Tables 3.8-8 and 3.8-9 already include its predicted contributions. Were specific projects implemented as part of the Proposed Project to include distribution centers, and if such installations were to create greater localized increases in roadway traffic, the presented traffic noise increases shown in Tables 3.8-8 and 3.8-9 suggest that such hypothetical increases (under the right conditions) could be accommodated and still result in an anticipated less than significant impact. This is because, due to acoustical principles, increases in traffic volumes (assuming same vehicle speeds, which would be anticipated due to existing roadway posted limits) would need to be more than a doubling of existing (or future, as appropriate) traffic volumes in order to effect greater than a 3 dB change. The only studied roadway segment that even approaches this possibility is East Wardlow Road, which as shown, is currently not expected to experience more than a 2 dB increase in noise level.

On-site Stationary Noise Sources

Future development under the Proposed Project could create new stationary noise sources, such as HVAC systems, power generators, refrigeration compressors, pumps, and other electromechanical or fluid handling equipment. Sound emissions from these operating equipment would need to comply with the municipal noise ordinances of Long Beach, Lakewood, and Signal Hill. With respect to the former, Table 3.8-4 presents the applicable thresholds for residential NSLU and would consequently require noise-producing machinery (or other stationary noise source) from a newly-developed project to not exceed a median sound level (i.e., L_{50}) of 45 dBA during the daytime and 35 dBA L_{50} at night.

To meet these thresholds, and by way of example, a typical 3-ton (of refrigeration performance) packaged air handling unit exhibits a sound pressure level of 71 dBA at one meter (York 2018). Were such machinery operating at night for a proposed new retail facility on the east side of Cherry Avenue across from existing NSLU on the west side of the street, it would need to be no closer than 210 feet away without some sort of noise-reducing project design feature. HVAC system components of this type and any larger, more powerful, and otherwise noisier equipment would similarly need to be located at sufficient distances from the NSLU as part of the design and implementation of future development. Amplified music from speakers installed at restaurants and other retail establishments would also need to be designed to emit sound levels that comply with the stationary source standards. Mitigation measure **MM-NOI-3** requires that future applicants for commercial and industrial developments within the Plan Area retain an acoustical

specialist to review development project construction-level plans. The acoustical specialist shall have the responsibility to ensure that the equipment specifications and plans for HVAC and other outdoor mechanical equipment incorporate measures, such as the specification of quieter equipment or provision of acoustical enclosures, that will avoid exceeding relevant noise standards. So long as these stationary sound emission sources are designed and implemented to comply with the noise ordinance limits at the exteriors of proximate NSLU, noise impacts would be considered less than significant with proper implementation of mitigation measure **MM-NOI-3**.

CEQA Impact Determination

In summary, mitigation measure **MM-NOI-3** requires involvement of an acoustical specialist with the responsibility to ensure that the equipment specifications and plans for HVAC and other outdoor mechanical equipment incorporate measures, such as the specification of quieter equipment or provision of acoustical enclosures or other sound abatement, are features of the project design. As a result, operational impacts would be **less than significant with mitigation incorporated** under CEQA.

NEPA Impact Determination

In summary, mitigation measure **MM-NOI-3** requires involvement of an acoustical specialist with the responsibility to ensure that the equipment specifications and plans for HVAC and other outdoor mechanical equipment incorporate measures, such as the specification of quieter equipment or provision of acoustical enclosures or other sound abatement, are features of the project design. As a result, during operations, there would be **no adverse effects** under NEPA.

b) Would the project generate excessive groundborne vibration or groundborne noise levels?

Construction activities that might expose persons to excessive ground-borne vibration or ground-borne noise could cause a potentially significant impact. Ground-borne vibration information related to construction activities has been collected by the California Department of Transportation (Caltrans 2013). Information from Caltrans indicates that continuous vibrations with a peak particle velocity (PPV) of approximately 0.1 inch/second begin to annoy people. Heavy pieces of construction equipment, such as large bulldozers and vibratory rollers, have reference PPV values of 0.089 inches/second and 0.210 inches/second respectively at a distance of 25 feet (DOT 2006). Because ground-borne vibration attenuates rapidly over short distances, at the closest distance between existing residential NSLU and the proposed construction areas (approximately 60 feet), expected vibration from a vibratory roller involved in street improvements would be 0.056 inches per second or less. While this predicted PPV is less than the Caltrans threshold for human

annoyance, it is higher than the 0.008 inches/second PPV as allowed by LBMC 8.80.200. Implementation of mitigation measure **MM-NOI-2** would ensure residences are notified of construction activities and provided contact information in the event they wish to report a noise- or vibration-related complaint. Advance notification eliminates the element of surprise, and establishes expectations to avoid fear regarding potential prolonged operations. The ability to contact a project representative if vibration is perceived to be excessive or damaging provides the opportunity for operations to be modified as necessary, or for compensation to be awarded in the event that accidental damage occurs.

The major concern with regard to construction vibration is related to building damage. Construction vibration as a result of developing future projects under the Proposed Project would not result in structural building damage, which typically occurs at vibration levels of 0.5 inches per second or greater for buildings of reinforced-concrete, steel, or timber construction. For non-reinforced timber and masonry structures, the threshold is less (0.2 inches per second) but still higher than the afore-stated estimate of 0.056 inches per second with respect to nearest vibratory roller operation during construction activities. Further, pile driving, blasting, or other special construction techniques are not anticipated to be needed for construction of developments allowed under the Proposed Project; therefore, excessive ground-borne vibration and ground-borne noise would not be generated.

CEQA Impact Determination

With respect to human annoyance, impacts related to ground-borne vibration from construction activities are considered to be a less than significant impact with mitigation measure **MM-NOI-2** incorporated. Impacts would be less than significant with mitigation incorporated under CEQA.

NEPA Impact Determination

With respect to human annoyance, effects related to ground-borne vibration from construction activities are considered to be not adverse with mitigation measure **MM-NOI-2** incorporated. As such, there would be **no adverse effect** under NEPA. Groundborne vibration from normally anticipated stationary operating equipment associated with development implemented under the Proposed Project would be expected to be minimal and at magnitudes either lower than or indistinguishable from typical ambient vibration that is largely the result of roadway traffic or current airport operations. HVAC systems and other electro-mechanical equipment (pumps, air compressors, generators, etc.) with rotating or reciprocating elements that might cause mechanical vibration are usually designed to exhibit very low levels of vibration, since the occurrence of undue vibration in such operating equipment indicates an imbalance or operation fault that could lead to

reduced operational life or failure of the equipment. Such systems are also typically vibration-isolated from structures by means of springs or pads, so that the vibration energy transmitted to ground prior to propagation out to the off-site communities would be dramatically reduced.

CEQA Impact Determination

With respect to human annoyance, impacts related to ground-borne vibration from operation of stationary sources (i.e., electro-mechanical equipment) installed as a result of site-specific development due to Proposed Project implementation are considered to be a **less than significant impact** and would thus not require mitigation under CEQA.

NEPA Impact Determination

With respect to human annoyance, effects related to ground-borne vibration from operation of stationary sources (i.e., electro-mechanical equipment) installed as a result of site-specific development due to Proposed Project implementation are considered to be **not adverse** and would thus not require mitigation under NEPA.

c) 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, would the project expose people residing or working in the project area to excessive noise levels??

Development of the Proposed Project, as currently contemplated under the GCSP, does not include the creation of any new residential land uses. Therefore, the GCSP would not expose new residents to excessive noise within the existing Long Beach Airport 65 dBA CNEL contours, as depicted in Figure 4 of the City of Long Beach ECR.

The Proposed Project does anticipate development of a Business Park (BP) district bounded by the Long Beach Airport to the north, south, and east. The portion of the BP expected to be located within the aforementioned 65 dBA CNEL contour is currently identified by the Proposed Project land use and mobility plan as being within the Community Commercial (CC) district planned north of the intersection between Hudson Avenue and Cover Street, and as such will create an opportunity for workers to be exposed to airport noise levels exceeding 65 dBA CNEL. At this location, anticipated noise impacts would be significant for development of exterior usage areas that might include restaurant patios, hotel balconies and outdoor recreation areas, and outdoor retail areas. Mitigation measure **MM-NOI-4** requires applicants for commercial and industrial developments within these areas within the Proposed Project Community Commercial (CC) district to retain an acoustical specialist to review development project construction-level plans. The

acoustical specialist shall have the responsibility to ensure that the design, location, and orientation (e.g., facing with respect to Long Beach Airport operations) of outdoor use areas will not expose facility occupant and visitors to airport operations noise levels greater than 65 dBA CNEL. Implementation of mitigation measure **MM-NOI-4** would help ensure that such developed outdoor occupied spaces feature noise reduction that keeps airport activity noise contribution to a level below 65 dBA CNEL. For the interior occupied spaces of these newly developed nonresidential land uses, Section 5.507.4.1 and 5.507.4.2 of the CalGreen building code would apply where the building locations are within the 65 dBA CNEL contour of the airport. The latter of these requirements, 5.507.4.2, establishes an interior background noise threshold of 50 dBA hourly Leq with respect to exterior-to-interior noise intrusion. Mitigation measure **MM-NOI-5** requires applicants for commercial and industrial developments within these areas within the Proposed Project Community Commercial (CC) district to retain an acoustical specialist to review development project construction-level plans. The acoustical specialist shall have the responsibility to ensure that the design and materials of sound insulating assemblies will be sufficient to yield interior background sound levels attributed to exterior-to-interior noise intrusion to no more than 50 dBA hourly Leq. Mitigation measure **MM-NOI-5** would be implemented to help ensure that such developed nonresidential indoor occupied spaces yield sufficient noise reduction for keeping airport activity noise intrusion to a level below 50 dBA hourly L_{eq}.

CEQA Impact Determination

Mitigation measures **MM-NOI-4** and **MM-NOI-5** would implement noise reduction features that ensure the potential airport activity noise contribution is below a level of significance. As such, this anticipated noise impact would be considered **less than significant with mitigation incorporated**.

NEPA Impact Determination

Mitigation measures **MM-NOI-4** and **MM-NOI-5** would implement noise reduction features that ensure the potential airport activity noise contribution is not adverse. As such, this anticipated noise is **not an adverse effect**.

3.8.5 Cumulative Impacts

Noise in Excess of Standards

The Proposed Project and related development projects within its area would all be subject to applicable noise standards (descriptions of the standards applicable within the municipalities of Long Beach and Signal Hill are described throughout this section). The Proposed Project would

incorporate mitigation measures, as described in Section 3.8.6, to ensure compliance with applicable noise standards. With the incorporation of the mitigation measures described in Section 3.8.6 below, the Proposed Project would not contribute to cumulative exceedances of noise standards, and its incremental effect is considered a **less than significant impact with mitigation incorporated**.

Temporary/Periodic Increases in Ambient Noise Levels

The Proposed Project would result in temporary noise increases during construction of future developments arising from its implementation, as discussed under item 3.8.4(a) above. The construction period of future developments under the Proposed Project has the potential to overlap with the construction of other projects in the sub-region. Due to the decrease in noise levels with distance and the presence of physical barriers, the related projects would not combine with future development under the propose project to produce a cumulative noise effect during construction. Additionally, all future development under the Proposed Project would be required to comply with limits on allowable construction hours per relevant portions of Long Beach, Lakewood, and Signal Hill noise ordinances. The implementation of the mitigation measures described in Section 3.8.6 below, along with the requirement to comply with applicable municipal regulations, would reduce future projects' incremental effect, ensuring that cumulative impacts are **less than significant**.

Vibration

Construction-related vibration from future development under the Proposed Project was addressed under item 3.8.4(b) above. Other foreseeable projects within the vicinity of the Plan Area would not be close enough to create a combined excessive generation of groundborne vibration. Therefore, with the implementation of mitigation measures described in Section 3.8.6 below, cumulative impacts associated with excessive groundborne vibration is considered **less than significant impact**.

Permanent Increase in Ambient Noise Levels

Stationary Sources. Long-term operational noise would result from operation of future development under the Proposed Project, such as permanent on-site noise sources (e.g., HVAC equipment), as addressed under item 3.8.4(a) above. A cumulative impact could result if noise produced resulting from implementation of the Proposed Project were to combine with noise produced from the operation of other related projects in the vicinity to create a cumulatively significant permanent increase in ambient noise levels. However, the operation of future projects under the Proposed Project, along with the operation of other related projects, would be subject to applicable requirements from the noise ordinances of the City of Long Beach, City of Lakewood, and the City of Signal Hill, which limit the exterior noise levels at residences and the allowable increase in outdoor ambient noise level, respectively. Implementation of mitigation measure **MM-**

NOI-3 would help ensure that future development under the Proposed Project complies with these noise standards. Similarly, other related projects would also be required to comply with the same noise standards, as applicable. Compliance with these municipal noise control ordinances would reduce the operational noise of future projects under the Proposed Project such that its incremental effect is not cumulatively considerable. As such, cumulative impacts to ambient noise levels is considered **less than significant impact with mitigation incorporated**.

Off-Site Traffic Noise. Future development under the Proposed Project along with other related projects would generate off-site traffic noise. When calculating future traffic impacts, the traffic study included traffic from related projects in the traffic model. Thus, future traffic results with and without the Proposed Project already account for the cumulative impacts from related projects contributing to traffic increases. Since the noise impacts are generated directly from the traffic analysis results, the Existing and Year 2040 traffic with and without Proposed Project predicted increases in traffic noise levels described herein already reflect cumulative impacts. As described herein, the noise level increases associated with both of these scenarios would generate a noise level increase of less than 3 dBA along the studied sample roadways in the vicinity of the Proposed Project. As such, anticipated increases would be below the significance threshold of 3 dBA for all three studied jurisdictions; hence, the incremental effect of the Proposed Project on off-site traffic noise is not cumulatively considerable. Cumulative off-site traffic noise impacts are thus considered **less than significant**.

3.8.6 Mitigation Measures

Noise mitigation measures for the Proposed Project are described below:

Construction

MM-NOI-1 Construction activities associated with the Proposed Project shall take place only during the permitted times and days per the City of Long Beach, City of Lakewood, and City of Signal Hill noise ordinances, respectively, for the NSLU under consideration.

MM-NOI-2 The City of Long Beach shall enforce adherence to the following measures for all future construction projects implemented under the Proposed Project, as a pre-requisite to approving necessary permits to proceed:

a. The project contractor shall, to the extent feasible, submit a construction noise management plan (CNMP) prepared or reviewed by a qualified acoustician (retained at the expense of the project applicant or construction contractor) that features the following:

i. A detailed construction schedule, at daily (or weekly, if activities during each day of the week are typical) resolution and correlating to areas or

zones of on-site project construction activity(ies) and the anticipated equipment types and quantities involved. Information will include expected hours of actual operation per day for each type of equipment per phase; and, indication of anticipated concurrent construction activities onsite.

ii. Suggested locations of a set of noise level monitors, attended by a qualified acoustician or another party under its supervision or direction, at which sample outdoor ambient noise levels will be measured and collected over a sufficient sample period and subsequently analyzed (i.e., compared with applicable time-dependent dBA thresholds) to ascertain compliance with the hourly FTA guidance-based limit of 90 dBA L_{eq}. Sampling shall be performed, at a minimum, on the first (or otherwise considered typical construction operations) day of each distinct construction phase.

iii. If sample collected noise level data indicates that the hourly noise threshold has or will be exceeded, construction work shall be suspended (for the activity or phase of concern) and the project applicant/owner or construction contractor shall implement one or more of the following measures as detailed or specified in the CNMP:

1) Administrative controls (e.g., reduce operating time of equipment and/or prohibit usage of equipment type[s] within certain distances).

2) Engineering controls (upgrade noise controls, such as install better engine exhaust mufflers).

3) Install noise abatement on the site boundary fencing (or within, as practical and appropriate) in the form of sound blankets or comparable temporary barriers to occlude construction noise emission between the site (or specific equipment operation as the situation may define) and the noise-sensitive receptor(s) of concern.

The implemented measure(s) will be reviewed or otherwise inspected and approved by the qualified acoustician (or another party under its supervision or direction) prior to resumption of the construction activity or process that caused the measured noise concern or need for noise mitigation. Noise levels shall be re-measured, after installation of said measures, to ascertain post-mitigation compliance with the noise threshold. As needed, this process shall be repeated and refined until noise level compliance is demonstrated and documented. A report of this implemented

mitigation and its documented success will be provided to the City Planner (or other authorized party, as directed by the City of Long Beach).

b. All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers. Enforcement shall be accomplished by random field inspections by applicant personnel during construction activities, to the satisfaction of the respective municipality building official or noise control officer.

c. Construction noise reduction methods such as shutting off idling equipment, construction of a temporary noise barrier, maximizing the distance between construction equipment staging areas and adjacent NSLU, and use of electric air compressors and similar power tools, in lieu of fossil-fueled equipment, shall be used where feasible.

d. During construction, stationary construction equipment shall be placed such that emitted noise is directed away from or shielded (i.e., introduce light-of-sight occluding barriers, such as storage trailers) from NSLU.

e. If equipment is being used that can cause hearing damage at adjacent noise receptor locations (distance attenuation shall be taken into account), portable noise barriers shall be installed that are demonstrated to be adequate to reduce noise levels at receptor locations below hearing damage thresholds (i.e., generally over 90 dBA, assuming this exposure for an 8-hour construction day). This may include erection of temporary berms or plywood barriers to create a break in the line-of-sight, or erection of a heavy fabric tent around the noise source.

f. Construction hours, allowable workdays, and the phone number of the job superintendent shall be clearly posted at all construction entrances to allow surrounding property owners to contact the job superintendent if necessary. In the event the municipality having jurisdiction receives a complaint, appropriate corrective actions shall be implemented and a report of the action provided to the reporting party. Appropriate corrective actions could include stricter enforcement of construction schedule, re-location of stationary equipment further from adjacent noise-sensitive receptors, reduction in the number of equipment working simultaneously in proximity to the sensitive receptor, erection of temporary noise barriers, or a combination of the above.

MM-NOI-3 Because heating, ventilation, and air conditioning (HVAC) equipment and other mechanical equipment can generate noise that could affect surrounding NSLU and because the details, specifications, and locations of this equipment is not yet known, the City of Long Beach shall require that future applicants for commercial and industrial developments within the Plan Area retain an acoustical specialist to review development project construction-level plans. The acoustical specialist shall have the responsibility to ensure that the equipment specifications and plans for HVAC and other outdoor mechanical equipment incorporate measures, such as the specification of quieter equipment or provision of acoustical enclosures, that will avoid exceeding relevant noise standards at nearby noise-sensitive land uses (e.g., residential). Prior to the commencement of construction for future commercial and industrial developments, the acoustical specialist shall certify in writing to the City of Long Beach that the equipment specifications and plans incorporate measures that will achieve the relevant noise limits.

MM-NOI-4 Because the details, specifications, and locations of commercial development potentially involving outdoor use areas within the Proposed Project Community Commercial (CC) district is not yet known, the City of Long Beach shall require that future applicants for commercial and industrial developments within these areas of the Proposed Project to retain an acoustical specialist to review development project construction-level plans. The acoustical specialist shall have the responsibility to ensure that the design, location, and orientation (e.g., facing with respect to Long Beach Airport operations) of outdoor use areas will not expose facility occupant and visitors to Long Beach Airport operations noise levels greater than 65 dBA CNEL. Prior to the approval of discretionary entitlements for future commercial and industrial developments, the acoustical specialist shall certify in writing to the City of Long Beach that the specifications and plans incorporate measures that will achieve this exterior noise limit for these outdoor use areas.

MM-NOI-5 Because the details, specifications, and locations of commercial development potentially involving nonresidential indoor occupied spaces within the Proposed Project Community Commercial (CC) district is not yet known, the City of Long Beach shall require that future applicants for commercial and industrial developments within these areas of the Proposed Project retain an acoustical specialist to review development project construction-level plans. The acoustical specialist shall have the responsibility to ensure that the design and materials of sound insulating assemblies (i.e., the composite of walls, doors, fenestration, etc.) will be sufficient to yield interior background sound levels attributed to exterior-to-interior noise intrusion to no more than 50 dBA hourly L_{eq}. Prior to the approval of discretionary entitlements for future commercial and industrial developments, the

acoustical specialist shall certify in writing to the City of Long Beach that the specifications and plans incorporate measures that will achieve this interior background noise limit for these occupied indoor use areas.

3.8.7 Significance After Mitigation

Upon implementation of mitigation measures **MM-NOI-1** through **MM-NOI-5**, the anticipated noise impacts of the Proposed Project would be considered **less than significant**.

3.8.8 References

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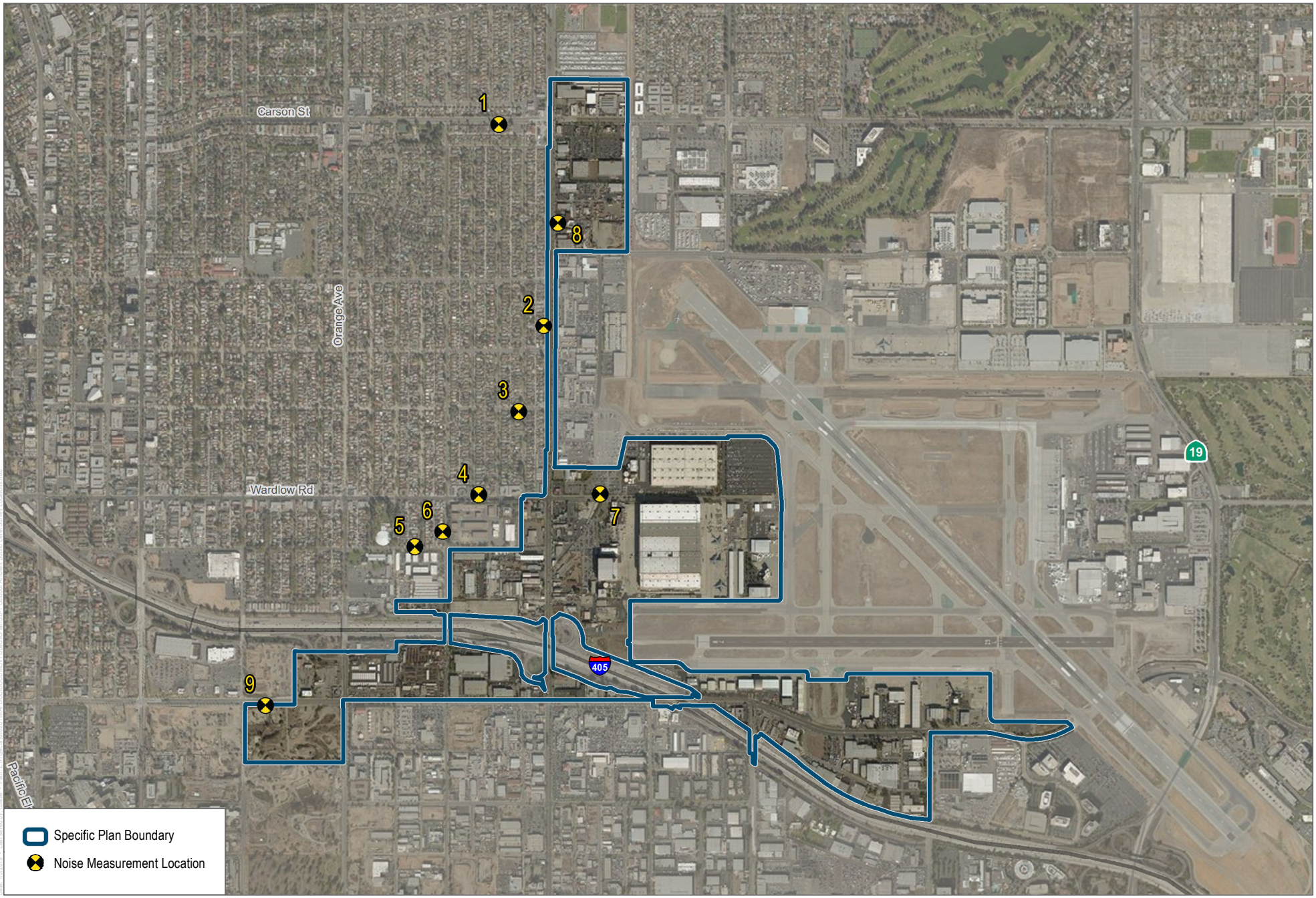

SOURCE: Bing 2018

DUDEK

0 1,000 2,000 Feet

FIGURE 3.8-1

Outdoor Ambient Sound Level Survey Locations

Globemaster Specific Plan

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