Environmental Noise Assessment

Global Carrier Truck Facility

San Joaquin County, California

August 7, 2020

Project # 200701

Prepared for:

Global Carrier, Inc.
1115 Hwy 120
Manteca, CA 95336

Prepared by:

Saxelby Acoustics LLC

Luke Saxelby, INCE Bd. Cert.
Principal Consultant
Board Certified, Institute of Noise Control Engineering (INCE)

(916) 760-8821
www.SaxNoise.com | Luke@SaxNoise.com
915 Highland Pointe Drive, Suite 250
Roseville, CA 95678

Table of Contents

Appendices

List of Figures

List of Tables

INTRODUCTION

The Global Carrier Trucking Facility project includes the construction of a parking facility for long haul truckers as well as a transfer loading dock, a brake shop, and a tire shop located in San Joaquin County, California. The project site covers 10 acres on the south side of Highway 120. The project is located east of Austin Road and west of Hart Lane. The project will provide 142 parking spaces for semi-trucks and 25 parking spaces for passenger vehicles. Surrounding land uses include industrial and agricultural uses. Existing single family residential uses are located to the east of the project site.

Figure 1 shows the project site plan. **Figure 2** shows an aerial photo of the project site.

ENVIRONMENTAL SETTING

BACKGROUND INFORMATION ON NOISE

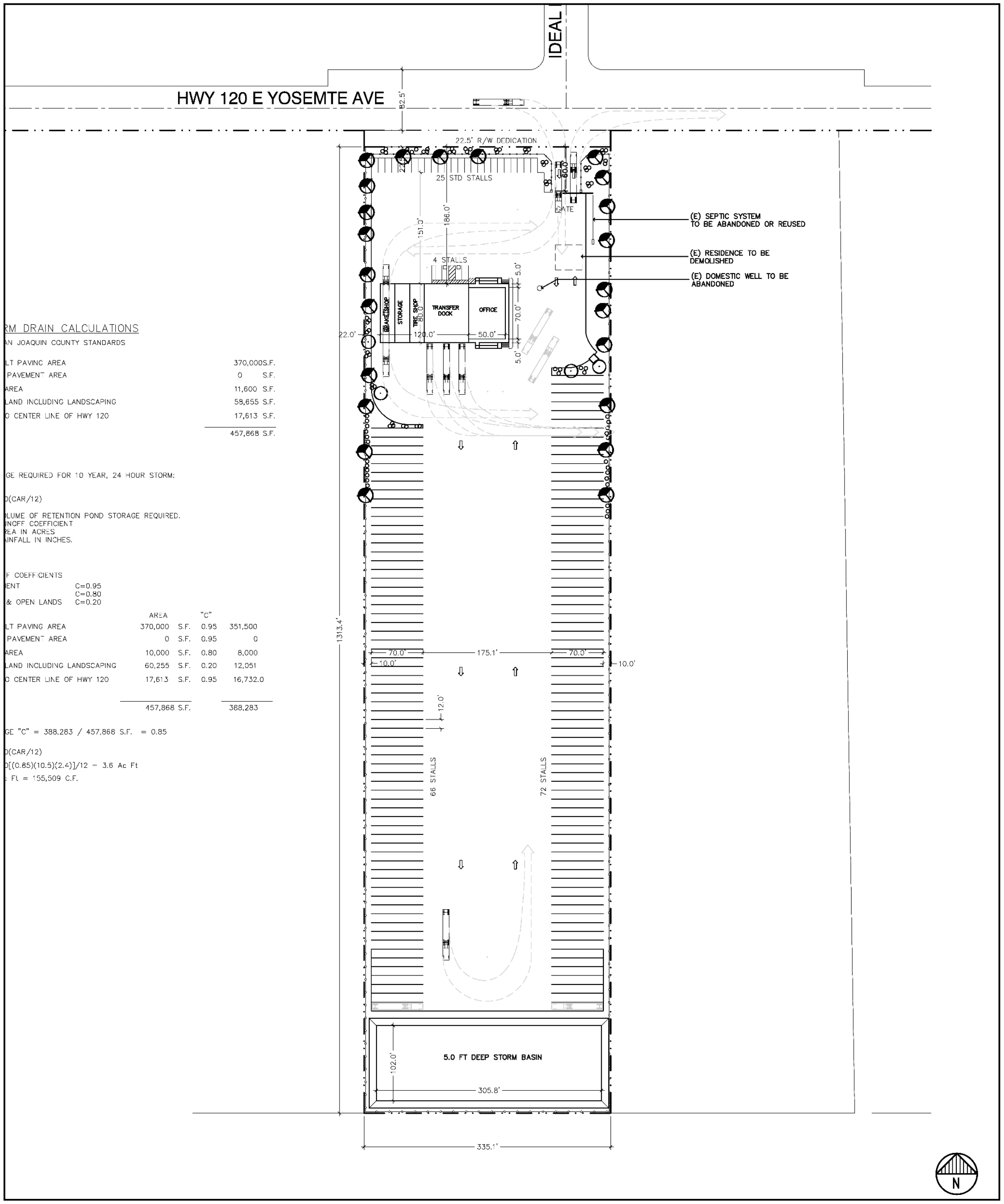
Fundamentals of Acoustics

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

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

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

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment.



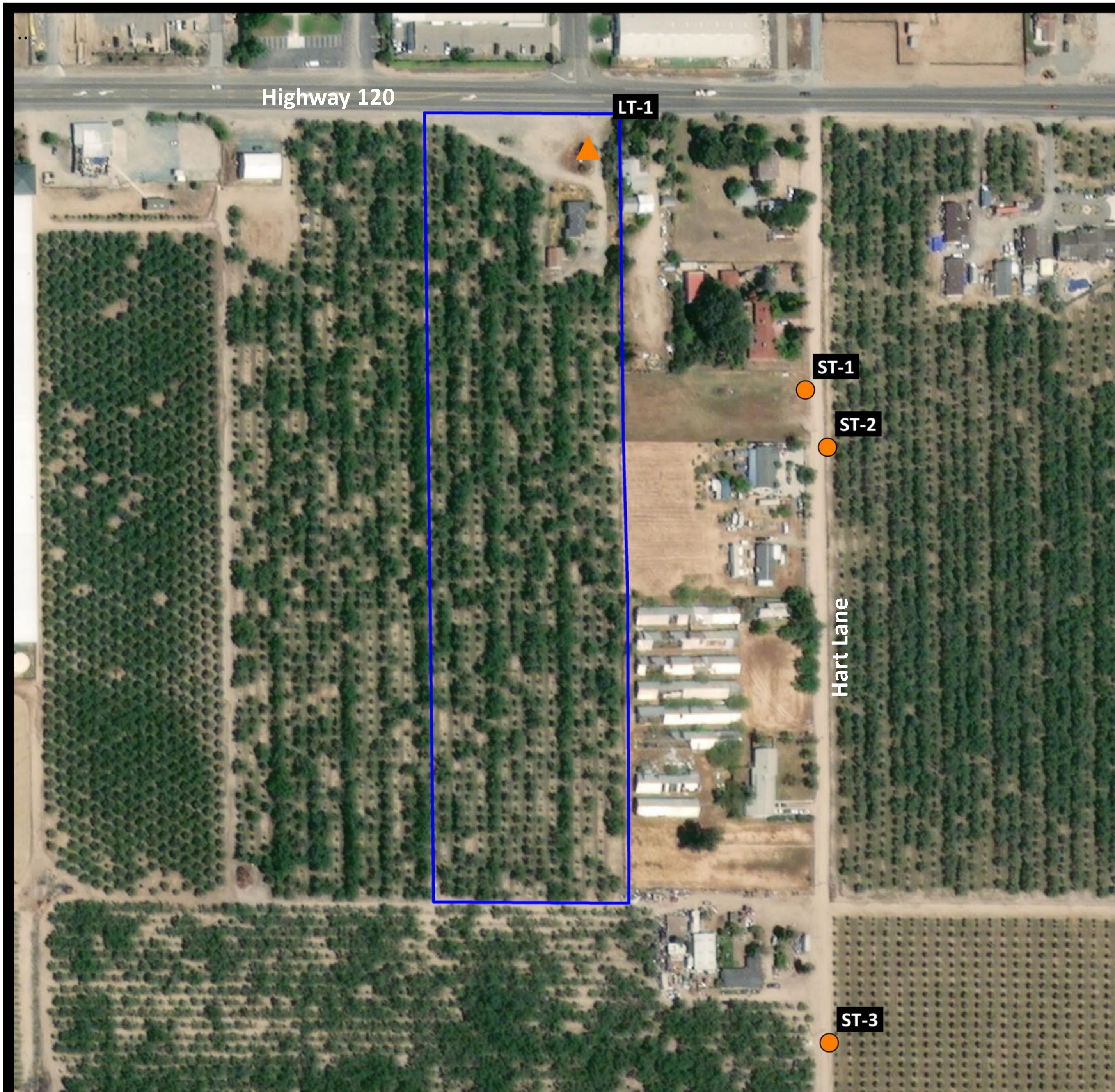
Global Carrier Truck Facility

San Joaquin County, California

Figure 1

Project Site Plan

SAXELBY ACOUSTICS
Acoustics • Noise • Vibration



Global Carrier Truck Facility

San Joaquin County, California

Figure 2

Noise Measurement Sites

Legend

- Project Site
- Noise Measurement - Long Term
- Noise Measurement - Short Term

100 ft 250 ft 400 ft

Projection: State Plane (California Zone 3) / NAD83 / meters
Rev. Date: 07/16/2020

SAXELBY ACOUSTICS
Acoustics · Noise · Vibration

The decibel scale is logarithmic, not linear. In other words, two sound levels 10-dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10-dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound, and twice as loud as a 60 dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool is the average, or equivalent, sound level (L_{eq}), which corresponds to a steady-state A weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptor, L_{dn}, and shows very good correlation with community response to noise.

The day/night average level (DNL or L_{dn}) is based upon the average noise level over a 24-hour day, with a +10-decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment.

Table 1 lists several examples of the noise levels associated with common situations. **Appendix A** provides a summary of acoustical terms used in this report.

TABLE 1: TYPICAL NOISE LEVELS

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft.)	--100--	
Gas Lawn Mower at 1 m (3 ft.)	--90--	
Diesel Truck at 15 m (50 ft.), at 80 km/hr. (50 mph)	--80--	Food Blender at 1 m (3 ft.) Garbage Disposal at 1 m (3 ft.)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft.)	--70--	Vacuum Cleaner at 3 m (10 ft.)
Commercial Area Heavy Traffic at 90 m (300 ft.)	--60--	Normal Speech at 1 m (3 ft.)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source: Caltrans, Technical Noise Supplement, Traffic Noise Analysis Protocol. September, 2013.

Effects of Noise on People

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction
- Interference with activities such as speech, sleep, and learning
- Physiological effects such as hearing loss or sudden startling

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1-dBA cannot be perceived;
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference;
- A change in level of at least 5-dBA is required before any noticeable change in human response would be expected; and
- A 10-dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6-dB per doubling of distance from the source, depending on environmental conditions (i.e. atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

EXISTING AND FUTURE NOISE AND VIBRATION ENVIRONMENTS

EXISTING NOISE RECEPTORS

Some land uses are considered more sensitive to noise than others. Land uses often associated with sensitive receptors generally include residences, schools, libraries, hospitals, and passive recreational areas. Sensitive noise receptors may also include threatened or endangered noise sensitive biological species, although many jurisdictions have not adopted noise standards for wildlife areas. Noise sensitive land uses are typically given special attention in order to achieve protection from excessive noise.

Sensitivity is a function of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities involved. In the vicinity of the project site, sensitive land uses include existing single-family residential uses located directly to the east of the project site.

EXISTING GENERAL AMBIENT NOISE LEVELS

The existing ambient noise environment in the project vicinity is primarily defined by traffic on Highway 120 and natural sounds such as birds and insects.

To quantify the existing ambient noise environment in the project vicinity, Saxelby Acoustics conducted continuous (24-hr.) noise level measurements at one location on the project site and short-term noise level measurements at three locations. Noise measurement locations are shown on **Figure 2**. A summary of the noise level measurement survey results is provided in **Table 2**. **Appendix B** contains the complete results of the noise monitoring.

The sound level meters were programmed to record the maximum, median, and average noise levels at each site during the survey. The maximum value, denoted L_{max}, represents the highest noise level measured. The average value, denoted L_{eq}, represents the energy average of all of the noise received by the sound level meter microphone during the monitoring period. The median value, denoted L_{50}, represents the sound level exceeded 50 percent of the time during the monitoring period.

Larson Davis Laboratories (LDL) model 820 and 831 precision integrating sound level meters were used for the ambient noise level measurement survey. The meters were calibrated before and after use with a B&K Model 4230 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4).

TABLE 2: SUMMARY OF EXISTING BACKGROUND NOISE MEASUREMENT DATA

Site	Date	Average Measured Hourly Noise Levels, dBA						
		CNEL/L_{dn}	Daytime (7:00 am - 10:00 pm)			Nighttime (10:00 pm – 7:00 am)		
			L_{eq}	L_{50}	L_{max}	L_{eq}	L_{50}	L_{max}
LT-1	7/16/20 – 7/17/20	71	68	65	84	63	53	79
ST-1	7/16/2020 – 9:37 a.m.	N/A	52	49	70	N/A	N/A	N/A
ST-2	7/16/2020 – 9:48 a.m.	N/A	49	48	57	N/A	N/A	N/A
ST-3	7/16/2020 – 9:19 a.m.	N/A	44	43	55	N/A	N/A	N/A

N/A Indicates that the CNEL/L_{dn} and nighttime levels are not applicable to short term noise measurements.
Source: Saxelby Acoustics – 2020

FUTURE TRAFFIC NOISE ENVIRONMENT AT OFF-SITE RECEPTORS

Off-Site Traffic Noise Impact Assessment Methodology

To assess noise impacts due to project-related traffic increases on the local roadway network, traffic noise levels are predicted at sensitive receptors for existing and future, project and no-project conditions.

Existing, Baseline, and Cumulative noise levels due to traffic are calculated using the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108). The model is based upon the Calveno reference noise factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site.

The FHWA model was developed to predict hourly L_{eq} values for free-flowing traffic conditions. To predict traffic noise levels in terms of L_{dn}, it is necessary to adjust the input volume to account for the day/night distribution of traffic.

Project trip generation volumes were provided by the project traffic engineer (KD Anderson & Associates 2020), truck usage and vehicle speeds on the local area roadways were estimated from field observations. The predicted increases in traffic noise levels on the local roadway network for Existing, Baseline, and Cumulative conditions which would result from the project are provided in terms of L_{dn}.

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each project-area roadway segment. In some locations sensitive receptors may not receive full shielding from noise barriers, or may be located at distances which vary from the assumed calculation distance.

Tables 3-5 summarize the modeled traffic noise levels at the nearest sensitive receptors along each roadway segment in the Project area. **Appendix C** provides the complete inputs and results of the FHWA traffic modeling.

TABLE 3: PREDICTED TRAFFIC NOISE LEVEL AND PROJECT-RELATED TRAFFIC NOISE LEVEL INCREASES

Roadway	Segment	Predicted Exterior Noise Level (dBA L_{dn}) at Closest Sensitive Receptors		
		Existing No Project	Existing + Project	Change
Button Avenue	North of Highway 120	59.2	59.4	0.2
Highway 120	East of Highway 99	67.7	67.9	0.2
Highway 99 Off Ramp	South of Highway 120	68.1	68.3	0.2
Austin Road	North of Highway 120	69.6	69.6	0.0
Highway 120	East of Austin Road	72.4	72.6	0.2
Highway 120	West of Austin Road	66.9	67.4	0.6
Austin Road	South of Highway 120	70.3	70.4	0.1
Highway 120	East of Project Entrance	65.5	66.0	0.6

TABLE 4: BASELINE TRAFFIC NOISE LEVEL AND PROJECT-RELATED TRAFFIC NOISE LEVEL INCREASES

Roadway	Segment	Predicted Exterior Noise Level (dBA L_{dn}) at Closest Sensitive Receptors		
		Existing No Project	Existing + Project	Change
Button Avenue	North of Highway 120	59.3	59.5	0.2
Highway 120	East of Highway 99	67.7	68.0	0.2
Highway 99 Off Ramp	South of Highway 120	68.1	68.3	0.2
Austin Road	North of Highway 120	69.7	69.7	0.0
Highway 120	East of Austin Road	72.4	72.6	0.2
Highway 120	West of Austin Road	66.9	67.4	0.6
Austin Road	South of Highway 120	70.4	70.4	0.1
Highway 120	East of Project Entrance	65.5	65.6	0.1

TABLE 5: CUMULATIVE TRAFFIC NOISE LEVEL AND PROJECT-RELATED TRAFFIC NOISE LEVEL INCREASES

Roadway	Segment	Predicted Exterior Noise Level (dBA L_{dn}) at Closest Sensitive Receptors		
		Existing No Project	Existing + Project	Change
Button Avenue	North of Highway 120	59.7	59.9	0.2
Highway 120	East of Highway 99	68.6	68.8	0.2
Highway 99 Off Ramp	South of Highway 120	68.3	68.5	0.2
Austin Road	North of Highway 120	71.0	71.0	0.0
Highway 120	East of Austin Road	73.6	73.8	0.2
Highway 120	West of Austin Road	66.3	66.8	0.5
Austin Road	South of Highway 120	71.7	71.8	0.1
Highway 120	East of Project Entrance	65.7	66.3	0.5

Based upon the data in **Tables 3-5**, the proposed project is predicted to result in an increase in a maximum traffic noise level increase of 0.6 dBA.

EVALUATION OF PROJECT OPERATIONAL NOISE AT RESIDENTIAL RECEPTORS

Loading Dock Noise Generation

To determine typical loading dock noise levels associated with the proposed loading docks, noise level measurement data from the Clearlake Wal-Mart store was used. The noise level measurements were conducted at a distance of 100 feet from the center of the two-bay loading dock and circulation area. Activities during the peak hour of loading dock activities included truck arrival/departures, truck idling, truck backing, air brake release, and operation of truck-mounted refrigeration units.

The results of the loading dock noise measurements indicate that a busy hour generated an average noise level of 61 dBA L_{eq} and 81 dBA L_{max} at a distance of 100 feet from the center of the loading dock truck maneuvering lanes. This analysis conservatively assumes that all proposed loading docks could operate at this level of activity in a busy hour.

Tire Shop and Brake Shop

To determine typical noise levels associated with the Tire Shop and Brake Shop on the project site, noise level measurement data from a Sacramento Unified School District bus repair facility was utilized. The noise level measurements were conducted at a distance of 120 feet from the repair shop entrance. Primary noise generation emanated from pneumatic tools.

The results of the bus repair shop noise measurements indicate that a busy hour generated an average noise level of 61 dBA L_{eq} and 76 dBA L_{max} at a distance of 120 feet from the bay of the bus repair shop. This analysis conservatively assumes that the Tire Shop and Brake shop could operate at this level of activity in a busy hour.

Parking Lot Circulation

Based upon the project traffic study, the peak hour trips for the project would be 9 vehicles. This analysis assumes that all of the vehicles would be tractor-trailers. Based upon noise measurements conducted of vehicle movements in parking lots, the sound exposure level (SEL) for a single passenger vehicle is 71 dBA at a distance of 50 feet while the SEL of a tractor-trailer is 85 dBA at the same distance.

Saxelby Acoustics used the SoundPLAN noise model to calculate noise levels at the nearest sensitive receptors. Input data included the loading dock, Tire and Brake shop, and parking lot noise generation, as discussed above. The results of this analysis are listed for daytime (7 a.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) hours in **Table 6** below. The results are listed in terms of the sound pressure level (SPL) at the property line.

TABLE 6: TRUCKING FACILITY OPERATIONAL NOISE AT PROPERTY LINE

Descriptor	SPL, Northern Boundary	SPL, Western Boundary	SPL, Eastern Boundary	SPL, Southern Boundary
Daytime (Leq, dBA)	53	63	52	37
Daytime (Lmax, dBA)	77	89	92	63
Nighttime (Leq, dBA)	41	46	46	36
Nighttime (Lmax, dBA)	77	89	92	63

CONSTRUCTION NOISE ENVIRONMENT

During the construction of the proposed project noise from construction activities would temporarily add to the noise environment in the project vicinity. As shown in **Table 7**, activities involved in construction would generate maximum noise levels ranging from 76 to 90 dB at a distance of 50 feet.

TABLE 7: CONSTRUCTION EQUIPMENT NOISE

Type of Equipment	Maximum Level, dBA at 50 feet
Auger Drill Rig	84
Backhoe	78
Compactor	83
Compressor (air)	78
Concrete Saw	90
Dozer	82
Dump Truck	76
Excavator	81
Generator	81
Jackhammer	89
Pneumatic Tools	85

Source: *Roadway Construction Noise Model User's Guide*. Federal Highway Administration. FHWA-HEP-05-054. January 2006.

CONSTRUCTION VIBRATION ENVIRONMENT

The primary vibration-generating activities associated with the proposed project would occur during construction when activities such as grading, utilities placement, and parking lot construction occur. **Table 8** shows the typical vibration levels produced by construction equipment.

TABLE 8: VIBRATION LEVELS FOR VARIOUS CONSTRUCTION EQUIPMENT

Type of Equipment	Peak Particle Velocity at 25 feet (inches/second)	Peak Particle Velocity at 50 feet (inches/second)	Peak Particle Velocity at 100 feet (inches/second)
Large Bulldozer	0.089	0.031	0.011
Loaded Trucks	0.076	0.027	0.010
Small Bulldozer	0.003	0.001	0.000
Auger/drill Rigs	0.089	0.031	0.011
Jackhammer	0.035	0.012	0.004
Vibratory Hammer	0.070	0.025	0.009
Vibratory Compactor/roller	0.210 (Less than 0.20 at 26 feet)	0.074	0.026

Source: *Transit Noise and Vibration Impact Assessment Guidelines.* Federal Transit Administration. May 2006.

REGULATORY CONTEXT

FEDERAL

There are no federal regulations related to noise that apply to the Proposed Project.

STATE

There are no state regulations related to noise that apply to the Proposed Project.

LOCAL

SAN JOAQUIN COUNTY NOISE STANDARDS

The San Joaquin County Development Regulations, Section 9-1025.9(b) establishes land use noise level standards for new non-transportation or “stationary” noise sources, as outlined below that would be applicable to the proposed activities under the new permit.

9-1025.9(b) Stationary Noise Sources.

Proposed projects that will create new stationary noise sources shall be required to mitigate the noise levels from these stationary noise sources so as not to exceed the noise level standards specified in Table 9-1025.9(b), Part II (**Table 9**).

TABLE 9: STATIONARY NOISE SOURCE NOISE STANDARDS

Noise Level Descriptor	Outdoor Activity Areas[1] Daytime[2] (7 a.m. to 10 p.m.)	Outdoor Activity Areas[1] Nighttime[2] (10 p.m. to 7 a.m.)
Hourly equivalent sound level (Leq), dB	50	45
Maximum sound level (Lmax), dB	70	65

1 Where the location of outdoor activity areas is unknown or is not applicable, the noise standard shall be applied at the property line of the receiving land use. When determining the effectiveness of noise mitigation measures, the standards shall be applied on the receiving side of noise barriers or other property line noise mitigation measures.

2 Each of the noise level standards specified shall be reduced by 5 dB for impulsive noise, single tone noise, or noise consisting primarily of speech or music.

(Ord. 3675; Ord. 4036 § 2(part), 1999)

IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Appendix G of the CEQA Guidelines states that a project would normally be considered to result in significant noise impacts if noise levels conflict with adopted environmental standards or plans or if noise generated by the project would substantially increase existing noise levels at sensitive receivers on a permanent or temporary basis. Significance criteria for noise impacts are drawn from CEQA Guidelines Appendix G (Items XI [a-f]).

Would the project:

a. 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?

b. Generate 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, would the project expose people residing or working in the project area to excessive noise levels?

Noise Level Increase Criteria for Long-Term Project-Related Noise Level Increases

The California Environmental Quality Act (CEQA) guidelines define a significant impact of a project if it "increases substantially the ambient noise levels for adjoining areas." Generally, a project may have a significant effect on the environment if it will substantially increase the ambient noise levels for adjoining areas or expose people to severe noise levels. In practice, more specific professional standards have been developed. These standards state that a noise impact may be considered significant if it would generate noise that would conflict with local project criteria or ordinances, or substantially increase noise levels at noise sensitive land uses. The potential increase in traffic noise from the project is a factor in determining significance. Research into the human perception of changes in sound level indicates the following:

- A 3-dB change is barely perceptible,
- A 5-dB change is clearly perceptible, and
- A 10-dB change is perceived as being twice or half as loud.

A limitation of using a single noise level increase value to evaluate noise impacts is that it fails to account for pre-project-noise conditions. **Table 11** is based upon recommendations made by the Federal Interagency Committee on Noise (FICON) to provide guidance in the assessment of changes in ambient noise levels resulting from aircraft operations. The recommendations are based upon studies that relate aircraft noise levels to the percentage of persons highly annoyed by the noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, it has been accepted that they are applicable to all sources of noise described in terms of cumulative noise exposure metrics such as the L_{dn}.

TABLE 10: SIGNIFICANCE OF CHANGES IN NOISE EXPOSURE

Ambient Noise Level Without Project, L_{dn}	Increase Required for Significant Impact
<60 dB	+5.0 dB or more
60-65 dB	+3.0 dB or more
>65 dB	+1.5 dB or more

Source: Federal Interagency Committee on Noise (FICON)

Based on **Table 11**, an increase in the traffic noise level of 5 dB or more would be significant where the pre-project noise levels are less than 60 dB L_{dn}, or 3 dB or more where existing noise levels are between 60 to 65 dB L_{dn}. Extending this concept to higher noise levels, an increase in the traffic noise level of 1.5 dB or more may be significant where the pre-project traffic noise level exceeds 65 dB L_{dn}. The rationale for the **Table 11** criteria is that as ambient noise levels increase, a smaller increase in noise resulting from a project is sufficient to cause annoyance.

PROJECT-SPECIFIC IMPACTS AND MITIGATION MEASURES

IMPACT 1: WOULD THE PROJECT GENERATE A SUBSTANTIAL TEMPORARY OR PERMANENT INCREASE IN AMBIENT NOISE LEVELS IN THE VICINITY OF THE PROJECT IN EXCESS OF STANDARDS ESTABLISHED IN THE LOCAL GENERAL PLAN OR NOISE ORDINANCE, OR APPLICABLE STANDARDS OF OTHER AGENCIES?

Traffic Noise Increases at Off-Site Receptors

The FICON guidelines specify criteria to determine the significance of traffic noise impacts. Where existing traffic noise levels are greater than 65 dB L_{dn}, at the outdoor activity areas of noise-sensitive uses, a +1.5 dB L_{dn} increase in roadway noise levels will be considered significant. According to **Table 3**, the maximum increase is traffic noise at the nearest sensitive receptor is predicted to be 0.6 dBA.

Therefore, impacts resulting from increased traffic noise would be considered ***less-than-significant***.

Operational Noise at Sensitive Receptors

Table 11 below compares the highest project-generated noise level at the property boundary with the San Joaquin County standards for stationary noise sources.

TABLE 11: OPERATIONAL NOISE LEVELS AT PROJECT BOUNDARY

Descriptor	SPL at Project Boundary	Noise Standard	Meets Standard?
Daytime (Leq, dBA)	63	50	No
Daytime (Lmax, dBA)	92	70	No
Nighttime (Leq, dBA)	46	45	No
Nighttime (Lmax, dBA)	92	65	No

Without additional noise control measures, the proposed project would exceed San Joaquin County daytime (7 a.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) noise standards as shown in **Table 11**. Therefore, impacts resulting from operational noise would be considered ***potentially significant*** and require mitigation**.**

Construction Noise

During the construction phases of the project, noise from construction activities would add to the noise environment in the immediate project vicinity. As indicated in **Table** , activities involved in construction would generate maximum noise levels ranging from 76 to 90 dBA L_{max} at a distance of 50 feet. Construction activities would also be temporary in nature and are anticipated to occur during normal daytime working hours.

Noise would also be generated during the construction phase by increased truck traffic on area roadways. A project-generated noise source would be truck traffic associated with transport of heavy materials and equipment to and from the construction site. This noise increase would be of short duration, and would occur during daytime hours.

Noise from localized point sources (such as construction sites) typically decreases by approximately 6 dBA with each doubling of distance from source to receptor. Given this noise attenuation rate and assuming no noise shielding from either natural or human-made features (e.g., trees, buildings, fences), outdoor receptors within approximately 1,600 feet of construction sites could experience maximum instantaneous noise levels of greater than 60 dBA when on-site construction-related noise levels exceed approximately 90 dBA at the boundary of the construction site. As previously discussed, nearby noise-sensitive receptors consist predominantly of residential dwellings located near the western and northern boundaries of the project site.

During development of the proposed project, construction activities occurring during the more noise-sensitive late evening and nighttime hours (i.e., 7 PM to 7 AM) could result in increased levels of annoyance and potential sleep disruption for occupants of nearby existing noise sensitive land uses. Additionally, there are several residential uses approximately 30 feet from the project site which may be subject to construction noise. As a result, noise-generating construction activities would be considered to have a potentially significant short-term impact.

Mitigation Measure

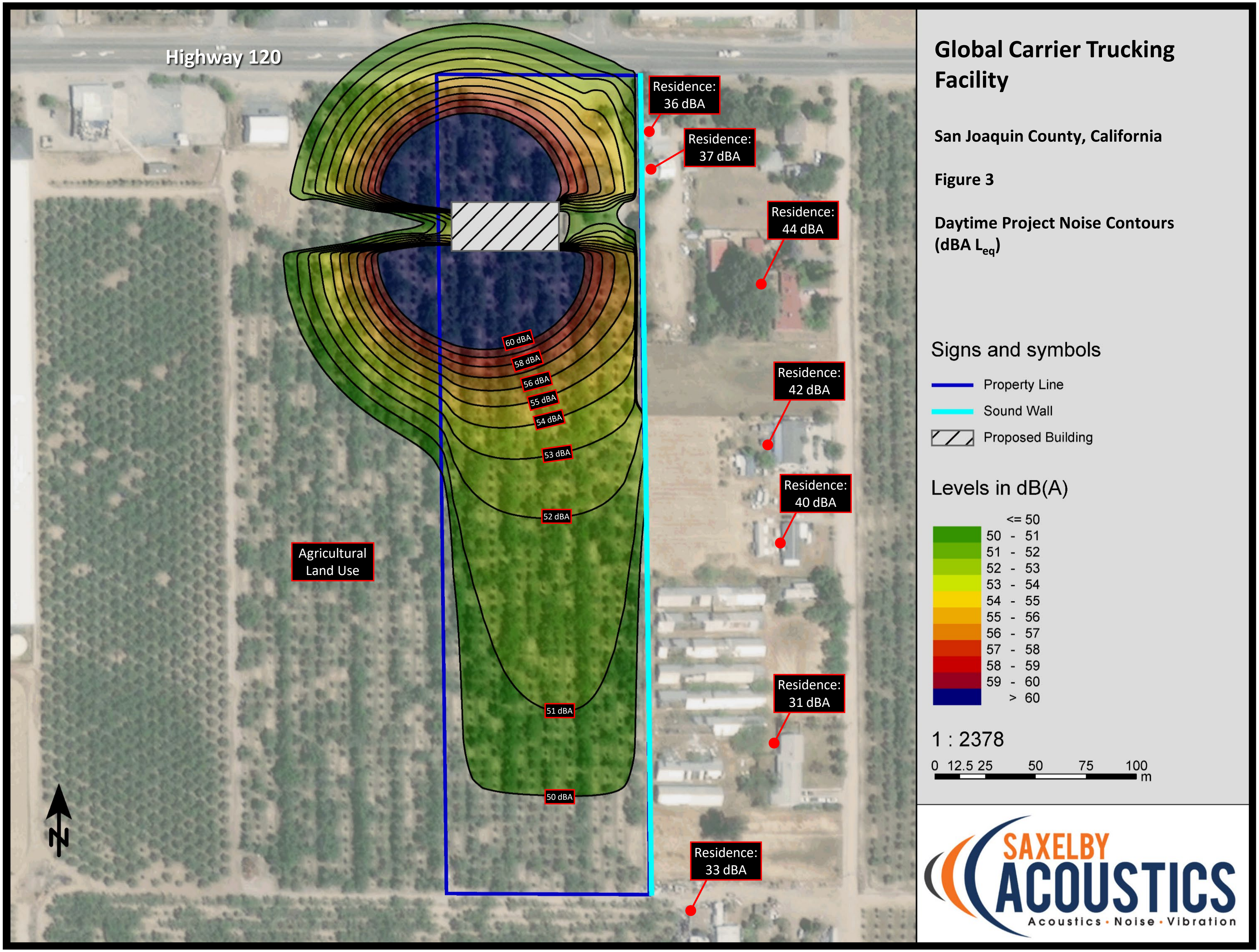
1(a) Prior to approval of project improvement plans, the improvement plans for the proposed project shall show that the residences east of the project boundary shall be shielded from the project operational noise through the use of ten-foot tall masonry sound walls per the approval of the County Engineer. The barrier height is measured as top of wall elevation relative to the finished grade of the project site and existing grade of the adjacent residential uses, whichever is higher. The barrier may consist of an 8-foot tall masonry wall on earthen berm to achieve the required 10-foot height. The approximate locations of this barrier and resulting noise contours for project noise are shown on **Figures 3-6**. Other types of barrier may be employed but shall be reviewed by an acoustical engineer prior to being constructed.

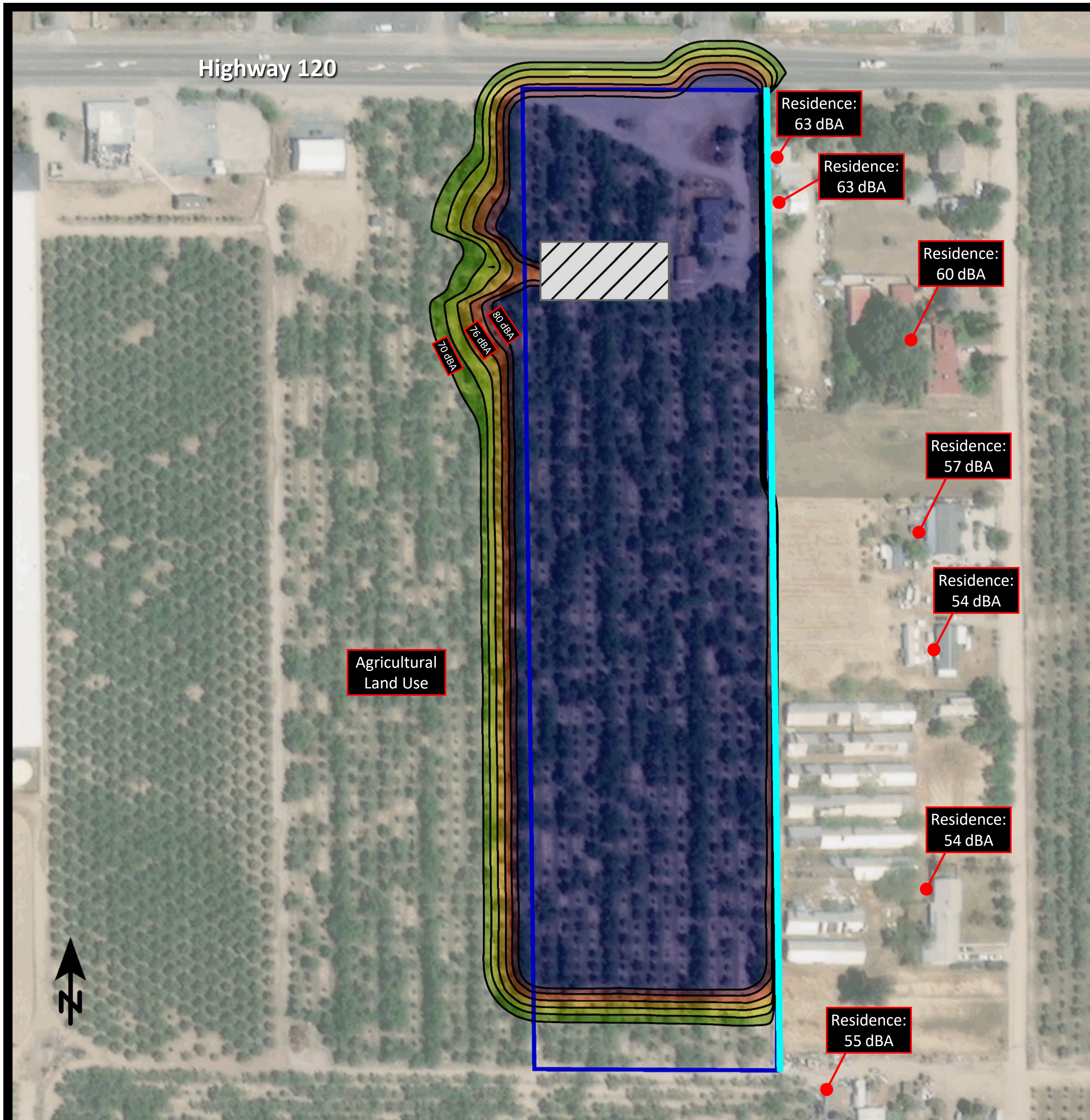
1(b) The County shall establish the following as conditions of approval for any permit that results in the use of construction equipment:

- Construction activities (excluding activities that would result in a safety concern to the public or construction workers) shall be limited to between the daytime hours of 7 AM and 7 PM daily.
- Construction equipment shall be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations. Equipment engine shrouds shall be closed during equipment operation.
- When not in use, motorized construction equipment shall not be left idling for more than 5 minutes.
- Stationary equipment (power generators, compressors, etc.) shall be located at the furthest practical distance from nearby noise-sensitive land uses or sufficiently shielded to reduce noise-related impacts.

Timing/Implementation: Implemented prior to approval of grading and/or building permits
Enforcement/Monitoring: San Joaquin County Community Development Services Department

Implementation of mitigation measures 1(a) and 1(b) would help to reduce construction-generated noise levels. With mitigation, this impact would be considered ***less-than-significant***.


Global Carrier Trucking Facility
San Joaquin County, California
Figure 3
Daytime Project Noise Contours (dBA L_{eq})
Signs and symbols
Property Line
Sound Wall
Proposed Building
Levels in dB(A)
<= 50
50 - 51
51 - 52
52 - 53
53 - 54
54 - 55
55 - 56
56 - 57
57 - 58
58 - 59
59 - 60
> 60
1 : 2378
0 12.5 25 50 75 100 m
SAXELBY ACOUSTICS
Acoustics · Noise · Vibration
Highway 120
Residence: 36 dBA
Residence: 37 dBA
Residence: 44 dBA
Residence: 42 dBA
Residence: 40 dBA
Residence: 31 dBA
Residence: 33 dBA
Agricultural Land Use
60 dBA
58 dBA
56 dBA
55 dBA
54 dBA
53 dBA
52 dBA
51 dBA
50 dBA
N



Global Carrier Trucking Facility

San Joaquin County, California

Figure 4

Daytime Project Noise Contours (dBA L_{max})

Signs and symbols

- Property Line
- Sound Wall
- Proposed Building

Levels in dB(A)

<= 70
70 - 72
72 - 74
74 - 76
76 - 78
78 - 80
> 80

1 : 2378

0 12.5 25 50 75 100 m

SAXELBY ACOUSTICS
Acoustics · Noise · Vibration

Global Carrier Trucking Facility

San Joaquin County, California

Figure 5

Nighttime Project Noise Contours (dBA L_{eq})

Signs and symbols

- Property Line
- Sound Wall
- Proposed Building

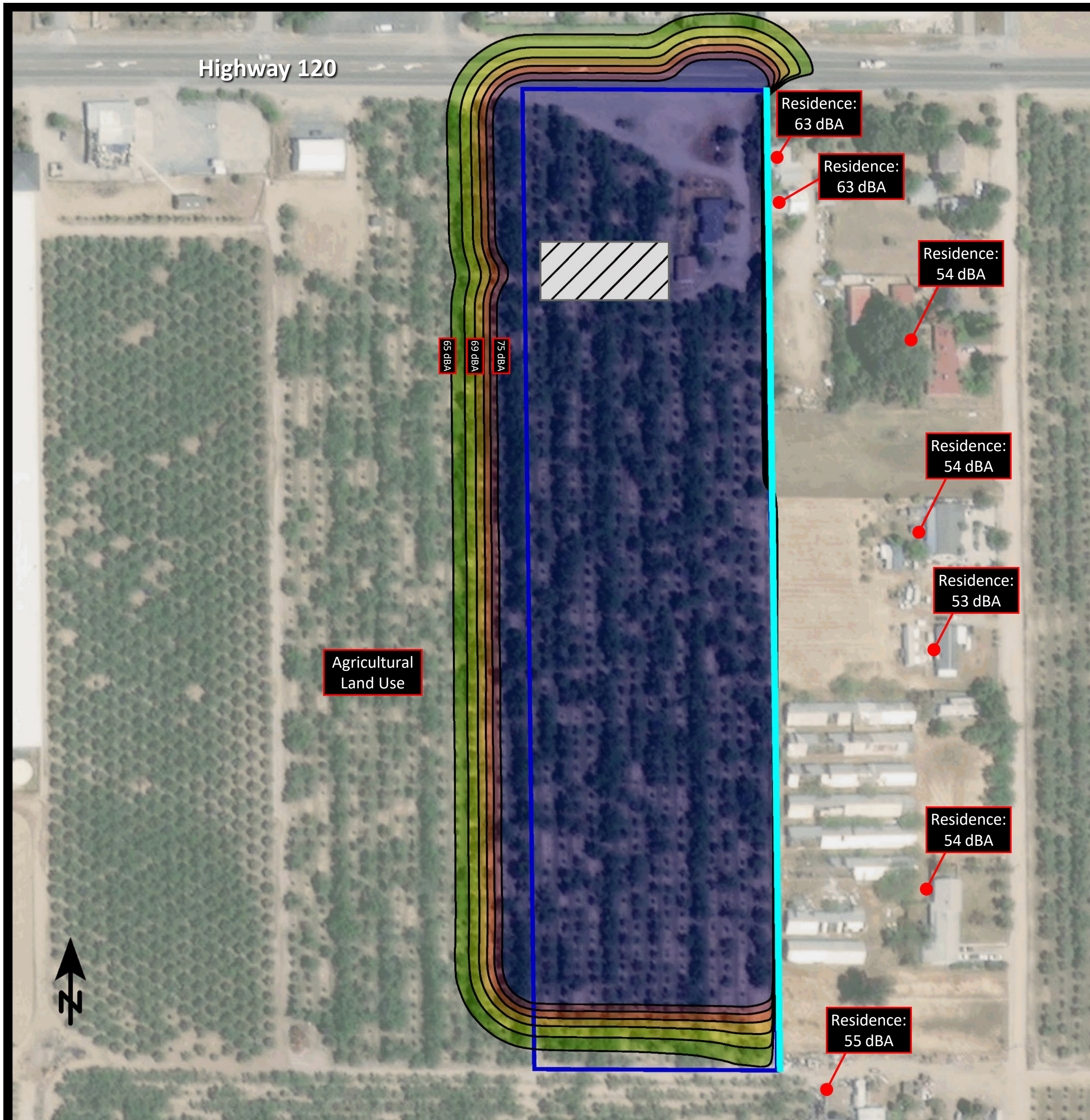
Levels in dB(A)

<= 45
45 - 46
46 - 47
47 - 48
48 - 49
49 - 50
50 - 51
51 - 52
52 - 53
53 - 54
54 - 55
> 55

1 : 2378

0 12.5 25 50 75 100 m

SAXELBY ACOUSTICS
Acoustics · Noise · Vibration



Global Carrier Trucking Facility

San Joaquin County, California

Figure 6

Nighttime Project Noise Contours (dBA L_{max})

Signs and symbols

- Property Line
- Sound Wall
- Proposed Building

Levels in dB(A)

<= 65
65 - 67
67 - 69
69 - 71
71 - 73
73 - 75
> 75

1 : 2378

0 12.5 25 50 75 100 m

SAXELBY ACOUSTICS
Acoustics · Noise · Vibration

IMPACT 2: WOULD THE PROJECT GENERATE EXCESSIVE GROUNDBORNE VIBRATION OR GROUNDBORNE NOISE LEVELS?

Construction vibration impacts include human annoyance and building structural damage. Human annoyance occurs when construction vibration rises significantly above the threshold of perception. Building damage can take the form of cosmetic or structural.

The **Table 8** data indicate that construction vibration levels anticipated for the project are less than the 0.2 in/sec threshold at distances of 26 feet. However, the proposed project includes parking lot construction which would occur at distances of approximately 10 feet from the adjacent single-family residential uses. Therefore, use of vibratory compactors within 26 feet of the adjacent residential buildings could cause vibrations in excess of 0.2 in/sec. Therefore, this is a **significant** impact.

Mitigation Measure(s)
Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

MM2(a): Any compaction required less than 26 feet from the adjacent residential structures to the south should be accomplished by using static drum rollers which use weight instead of vibrations to achieve soil compaction. As an alternative to this requirement, pre-construction crack documentation and construction vibration monitoring could be conducted to ensure that construction vibrations do not cause damage to any adjacent structures.

IMPACT 3: 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?

There are no airports in the project vicinity. Therefore, this impact is not applicable to the proposed project.

REFERENCES

American National Standards Institute. (1998). *[Standard] ANSI S1.43-1997 (R2007): Specifications for integrating-averaging sound level meters*. New York: Acoustical Society of America.

American Standard Testing Methods, *Standard Guide for Measurement of Outdoor A-Weighted Sound Levels, American Standard Testing Methods (ASTM) E1014-08*, 2008.

ASTM E1014-12. *Standard Guide for Measurement of Outdoor A-Weighted Sound Levels*. ASTM International. West Conshohocken, PA. 2012.

ASTM E1780-12. *Standard Guide for Measuring Outdoor Sound Received from a Nearby Fixed Source.* ASTM International. West Conshohocken, PA. 2012.

Barry, T M. (1978). *FHWA highway traffic noise prediction model* (FHWA-RD-77-108). Washington, DC: U.S. Department of transportation, Federal highway administration, Office of research, Office of environmental policy.

California Department of Transportation (Caltrans), *Technical Noise Supplement, Traffic Noise Analysis Protocol*, September 2013.

Egan, M. D. (1988). Architectural acoustics. United States of America: McGraw-Hill Book Company.

Federal Highway Administration. *FHWA Roadway Construction Noise Model User's Guide.* FHWA-HEP-05-054 DOT-VNTSC-FHWA-05-01. January 2006.

Hanson, Carl E. (Carl Elmer). (2006). *Transit noise and vibration impact assessment*. Washington, DC: U.S. Department of Transportation, Federal Transit Administration, Office of Planning and Environment.

International Electrotechnical Commission. Technical committee 29: Electroacoustics. International Organization of Legal Metrology. (2013). *Electroacoustics: Sound level meters*.

International Organization for Standardization. (1996). *Acoustic - ISO 9613-2: Attenuation of sound during propagation outdoors. Part 2: General methods of calculation*. Ginevra: I.S.O.

Miller, L. N., Bolt, Beranek, & and Newman, Inc. (1981). *Noise control for buildings and manufacturing plants*. Cambridge, MA: Bolt, Beranek and Newman, Inc.

SoundPLAN. SoundPLAN GmbH. Backnang, Germany. http://www.soundplan.eu/english/

Appendix A: Acoustical Terminology

Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
ASTC	Apparent Sound Transmission Class. Similar to STC but includes sound from flanking paths and correct for room reverberation. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.
Attenuation	The reduction of an acoustic signal.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by +5 dBA and nighttime hours weighted by +10 dBA.
DNL	See definition of Ldn.
IIC	Impact Insulation Class. An integer-number rating of how well a building floor attenuates impact sounds, such as footsteps. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz (Hz).
Ldn	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
Leq	Equivalent or energy-averaged sound level.
Lmax	The highest root-mean-square (RMS) sound level measured over a given period of time.
L(n)	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L50 is the sound level exceeded 50% of the time during the one-hour period.
Loudness	A subjective term for the sensation of the magnitude of sound.
NIC	Noise Isolation Class. A rating of the noise reduction between two spaces. Similar to STC but includes sound from flanking paths and no correction for room reverberation.
NNIC	Normalized Noise Isolation Class. Similar to NIC but includes a correction for room reverberation.
Noise	Unwanted sound.
NRC	Noise Reduction Coefficient. NRC is a single-number rating of the sound-absorption of a material equal to the arithmetic mean of the sound-absorption coefficients in the 250, 500, 1000, and 2,000 Hz octave frequency bands rounded to the nearest multiple of 0.05. It is a representation of the amount of sound energy absorbed upon striking a particular surface. An NRC of 0 indicates perfect reflection; an NRC of 1 indicates perfect absorption.
RT60	The time it takes reverberant sound to decay by 60 dB once the source has been removed.
Sabin	The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 Sabin.
SEL	Sound Exposure Level. SEL is a rating, in decibels, of a discrete event, such as an aircraft flyover or train pass by, that compresses the total sound energy into a one-second event.
SPC	Speech Privacy Class. SPC is a method of rating speech privacy in buildings. It is designed to measure the degree of speech privacy provided by a closed room, indicating the degree to which conversations occurring within are kept private from listeners outside the room.
STC	Sound Transmission Class. STC is an integer rating of how well a building partition attenuates airborne sound. It is widely used to rate interior partitions, ceilings/floors, doors, windows and exterior wall configurations. The STC rating is typically used to rate the sound transmission of a specific building element when tested in laboratory conditions where flanking paths around the assembly don't exist. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.
Threshold of Hearing	The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.
Threshold of Pain	Approximately 120 dB above the threshold of hearing.
Impulsive	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
Simple Tone	Any sound which can be judged as audible as a single pitch or set of single pitches.

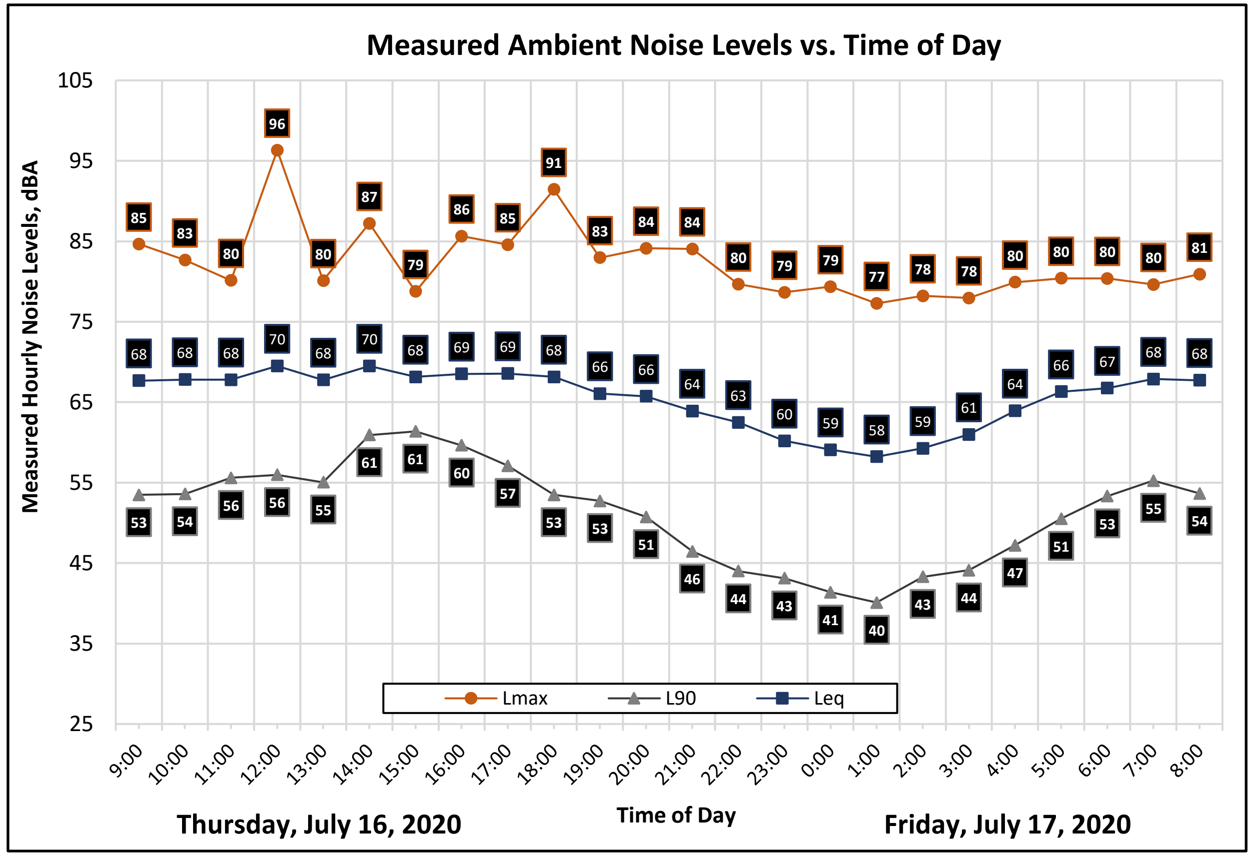
Appendix B: Continuous and Short-Term Ambient Noise Measurement Results

Appendix B1: Continuous Noise Monitoring Results

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Thursday, July 16, 2020	9:00	68	85	65	53
Thursday, July 16, 2020	10:00	68	83	66	54
Thursday, July 16, 2020	11:00	68	80	66	56
Thursday, July 16, 2020	12:00	70	96	66	56
Thursday, July 16, 2020	13:00	68	80	66	55
Thursday, July 16, 2020	14:00	70	87	67	61
Thursday, July 16, 2020	15:00	68	79	67	61
Thursday, July 16, 2020	16:00	69	86	67	60
Thursday, July 16, 2020	17:00	69	85	67	57
Thursday, July 16, 2020	18:00	68	91	65	53
Thursday, July 16, 2020	19:00	66	83	64	53
Thursday, July 16, 2020	20:00	66	84	61	51
Thursday, July 16, 2020	21:00	64	84	58	46
Thursday, July 16, 2020	22:00	63	80	54	44
Thursday, July 16, 2020	23:00	60	79	50	43
Friday, July 17, 2020	0:00	59	79	45	41
Friday, July 17, 2020	1:00	58	77	45	40
Friday, July 17, 2020	2:00	59	78	47	43
Friday, July 17, 2020	3:00	61	78	51	44
Friday, July 17, 2020	4:00	64	80	56	47
Friday, July 17, 2020	5:00	66	80	62	51
Friday, July 17, 2020	6:00	67	80	64	53
Friday, July 17, 2020	7:00	68	80	66	55
Friday, July 17, 2020	8:00	68	81	65	54

Statistics	Leq	Lmax	L50	L90
Day Average	68	84	65	55
Night Average	63	79	53	45
Day Low	64	79	58	46
Day High	70	96	67	61
Night Low	58	77	45	40
Night High	67	80	64	53
Ldn	71	Day %		84
CNEL	71	Night %		16

Site: LT-1
Project: Global Carrier Trucking Facility
Location: Northern Project Boundary
Coordinates: 37.7973275°, -121.1719723°
Meter: LDL 812-1
Calibrator: CAL200



Appendix B2 : Short Term Noise Monitoring Results

Site: ST-1
Project: Global Carrier Manteca Trucking Facilities
Meter: LDL 831-3
Location: Western Project Boundary
Calibrator: CAL200
Coordinates: 37.7962158°, -121.1706919°

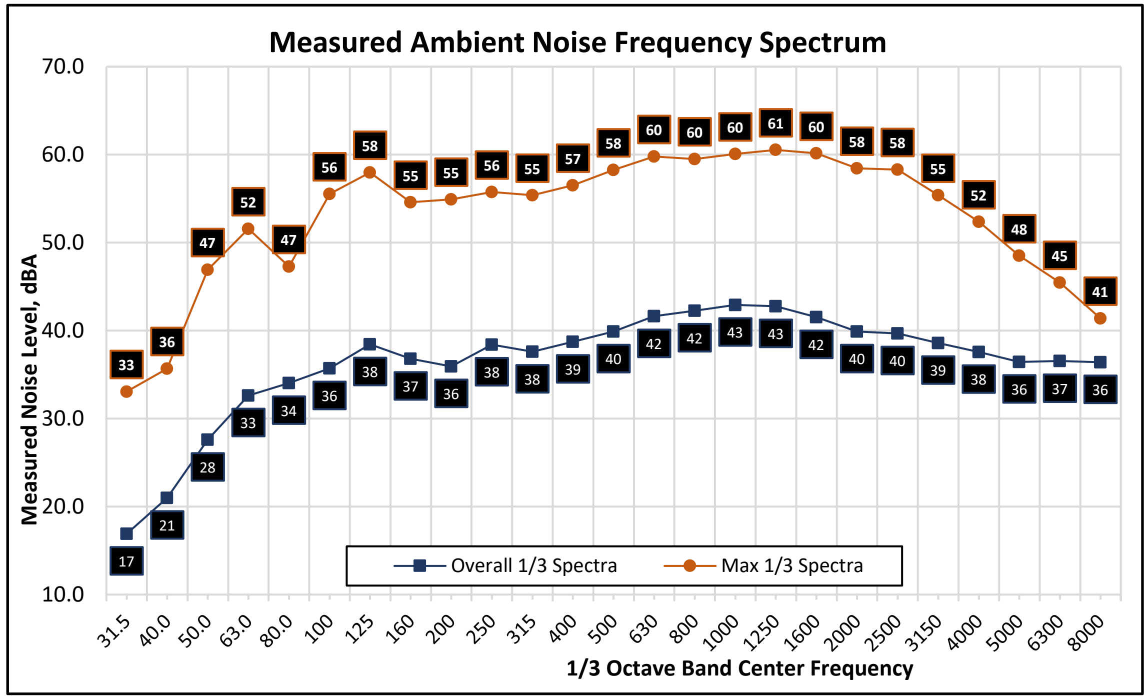
Start: 2020-07-16 09:37:06
Stop: 2020-07-16 09:47:06
SLM: Model 831
Serial: 1329

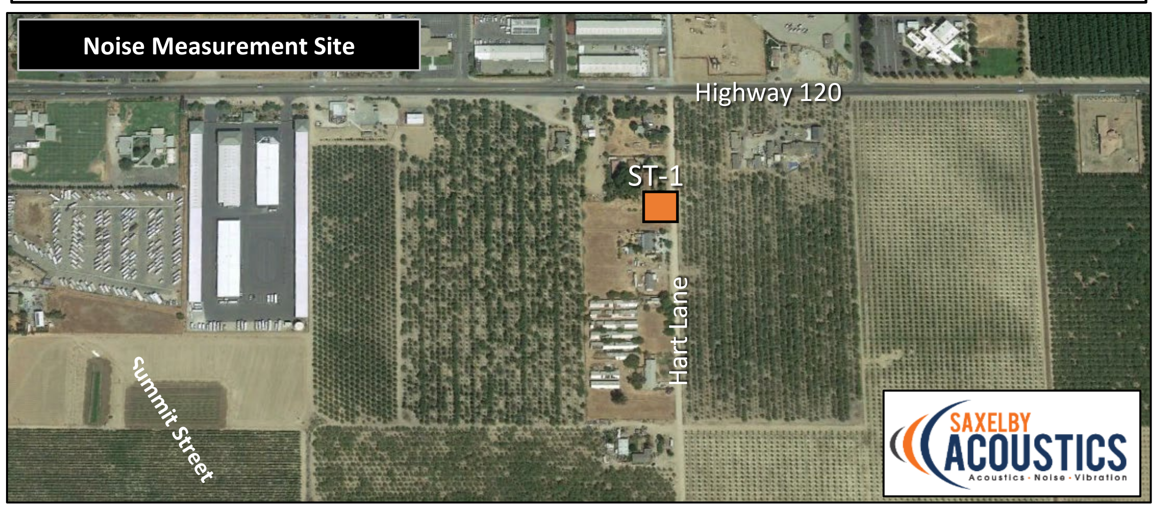
Measurement Results, dBA

Duration:	0:10
L_{eq}:	52
L_{max}:	70
L_{min}:	43
L_{50}:	49
L_{90}:	46

Notes

Noise environment consists of natural sounds such as birds and bugs, traffic noise from Hwy. 120, and vehicles passing on Hart Lane.





Appendix B3 : Short Term Noise Monitoring Results

Site: ST-2
Project: Global Carrier Manteca Trucking Facilities
Location: Western Project Boundary
Coordinates: 37.7959506°, -121.1705638°
Meter: LDL 831-3
Calibrator: CAL200

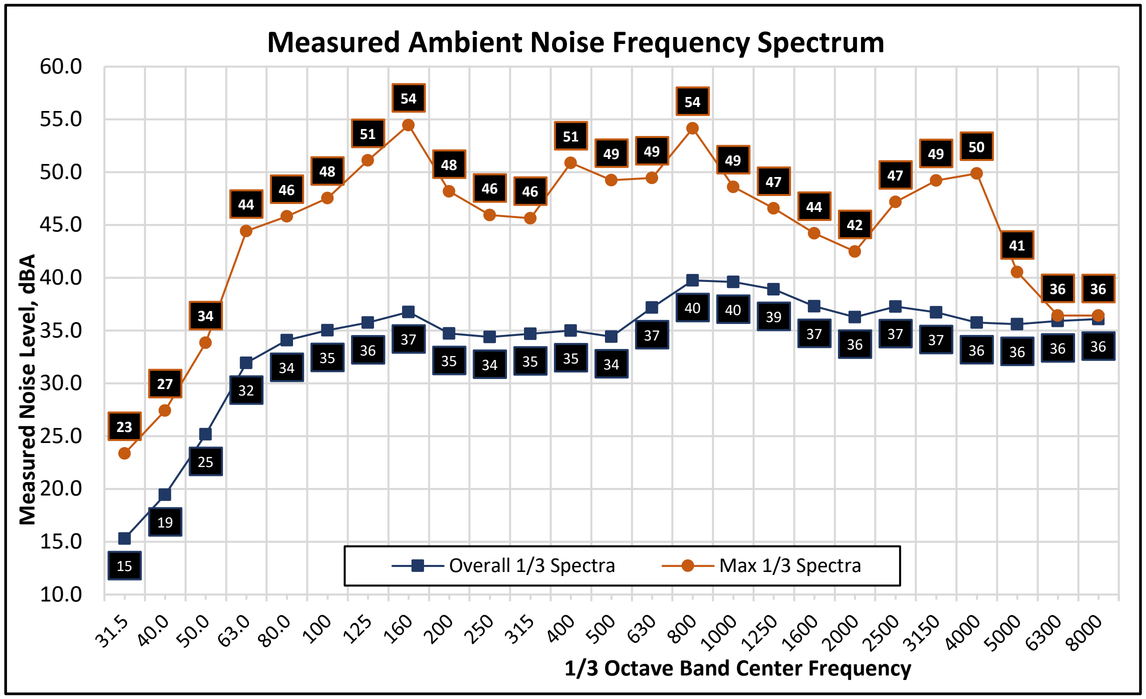
Start: 2020-07-16 09:48:14
Stop: 2020-07-16 09:58:14
SLM: Model 831
Serial: 1329

Measurement Results, dBA

Duration:	0:10
L_{eq}:	49
L_{max}:	57
L_{min}:	40
L_{50}:	48
L_{90}:	44

Notes

Noise environment consists of natural sounds such as birds and bugs, traffic noise from Hwy. 120, and vehicles passing on Hart Lane.



Appendix B4 : Short Term Noise Monitoring Results

Site: ST-3
Project: Global Carrier Manteca Trucking Facilities
Meter: LDL 831-3
Location: Southern Project Boundary
Calibrator: CAL200
Coordinates: 37.7931929°, -121.1705285°

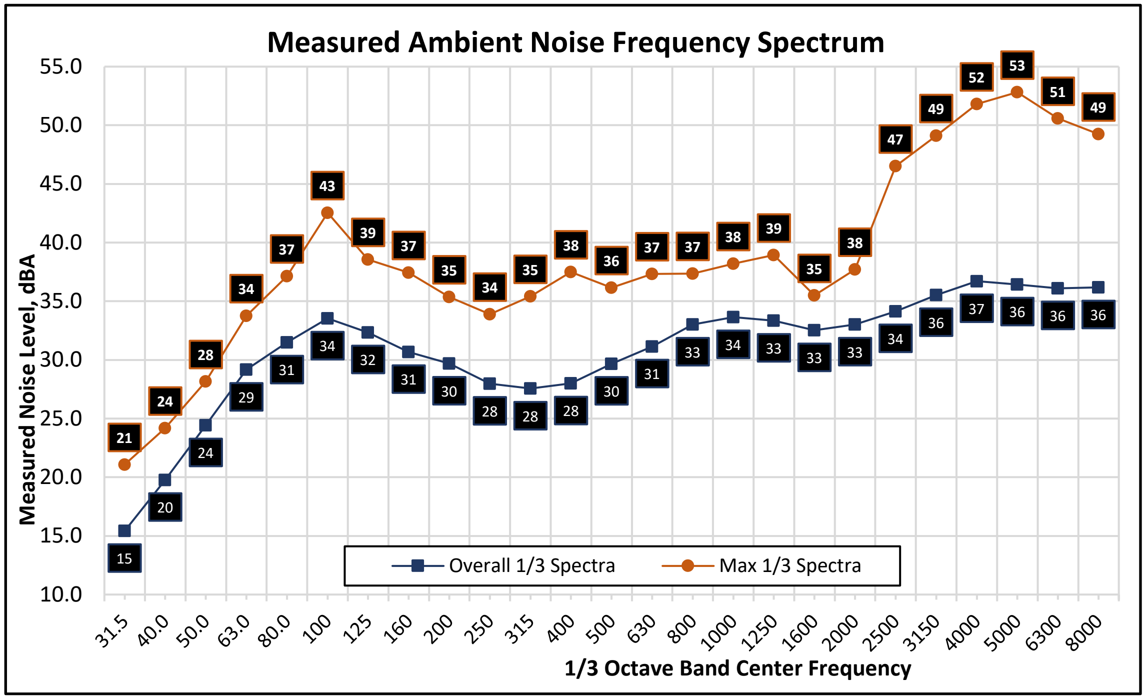
Start: 2020-07-16 09:19:08
Stop: 2020-07-16 09:29:08
SLM: Model 831
Serial: 1329

Measurement Results, dBA

Duration:	0:10
L_{eq}:	44
L_{max}:	55
L_{min}:	40
L_{50}:	43
L_{90}:	41

Notes

Primary noise source is traffic from Hwy. 120. Seconday noise source is natural sounds such as birds and insects. Lmax due to passing pickup truck on Hart Lane.



Appendix C: Traffic Noise Calculation Inputs and Results

Appendix C-1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 200701
Description: Global Carrier Trucking Facility - Existing
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Button Avenue	North of Hwy. 120	27,530	84	0	16	2.0%	5.0%	40	400	0	356	165	77	59.2
2	Highway 120	East of Hwy. 99	10,690	84	0	16	2.0%	5.0%	35	50	0	163	75	35	67.7
3	Hwy. 99 Off Ramp	South of Hwy. 120	3,580	84	0	16	2.0%	5.0%	65	50	0	173	81	37	68.1
4	Austin Road	North of Hwy. 120	17,430	84	0	16	1.0%	1.0%	45	50	0	219	102	47	69.6
5	Highway 120	East of Austin Road	20,330	84	0	16	2.0%	5.0%	45	50	0	335	156	72	72.4
6	Highway 120	West of Austin Road	7,500	84	0	16	2.0%	5.0%	45	60	0	172	80	37	66.9
7	Austin Road	South of Hwy. 120	16,590	84	0	16	2.0%	5.0%	45	60	0	293	136	63	70.3
8	Highway 120	East of Project Entrance	8,350	84	0	16	2.0%	5.0%	45	80	0	185	86	40	65.5

SAXELBY ACOUSTICS
Acoustics · Noise · Vibration

Appendix C-2
FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 200701
Description: Global Carrier Trucking Facility - Existing Plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Button Avenue	North of Hwy. 120	27,630	84	0	16	2.3%	5.4%	40	400	0	367	171	79	59.4
2	Highway 120	East of Hwy. 99	10,710	84	0	16	2.3%	5.4%	35	50	0	169	78	36	67.9
3	Hwy. 99 Off Ramp	South of Hwy. 120	3,600	84	0	16	2.4%	5.5%	65	50	0	178	83	38	68.3
4	Austin Road	North of Hwy. 120	17,550	84	0	16	1.0%	1.0%	45	50	0	220	102	47	69.6
5	Highway 120	East of Austin Road	20,430	84	0	16	2.3%	5.4%	45	50	0	346	161	75	72.6
6	Highway 120	West of Austin Road	7,500	84	0	16	2.9%	6.3%	45	60	0	188	87	40	67.4
7	Austin Road	South of Hwy. 120	16,640	84	0	16	2.1%	5.1%	45	60	0	295	137	64	70.4
8	Highway 120	East of Project Entrance	8,370	84	0	16	2.9%	6.3%	45	80	0	202	94	44	66.0

SAXELBY ACOUSTICS
Acoustics · Noise · Vibration

Appendix C-3

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 200701

Description: Global Carrier Trucking Facility - Future Baseline no Project

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Button Avenue	North of Hwy. 120	27,680	84	0	16	2.0%	5.0%	40	400	0	357	166	77	59.3
2	Highway 120	East of Hwy. 99	10,830	84	0	16	2.0%	5.0%	35	50	0	164	76	35	67.7
3	Hwy. 99 Off Ramp	South of Hwy. 120	3,580	84	0	16	2.0%	5.0%	65	50	0	173	81	37	68.1
4	Austin Road	North of Hwy. 120	17,580	84	0	16	1.0%	1.0%	45	50	0	220	102	47	69.7
5	Highway 120	East of Austin Road	20,480	84	0	16	2.0%	5.0%	45	50	0	337	156	73	72.4
6	Highway 120	West of Austin Road	7,500	84	0	16	2.0%	5.0%	45	60	0	172	80	37	66.9
7	Austin Road	South of Hwy. 120	16,740	84	0	16	2.0%	5.0%	45	60	0	294	137	63	70.4
8	Highway 120	East of Project Entrance	8,400	84	0	16	2.0%	5.0%	45	80	0	186	86	40	65.5

SAXELBY ACOUSTICS
Acoustics · Noise · Vibration

Appendix C-4

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 200701

Description: Global Carrier Trucking Facility - Future Baseline Plus Project

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Button Avenue	North of Hwy. 120	27,780	84	0	16	2.3%	5.4%	40	400	0	369	171	79	59.5
2	Highway 120	East of Hwy. 99	10,850	84	0	16	2.3%	5.4%	35	50	0	170	79	37	68.0
3	Hwy. 99 Off Ramp	South of Hwy. 120	3,600	84	0	16	2.4%	5.5%	65	50	0	178	83	38	68.3
4	Austin Road	North of Hwy. 120	17,700	84	0	16	1.0%	1.0%	45	50	0	221	103	48	69.7
5	Highway 120	East of Austin Road	20,580	84	0	16	2.3%	5.4%	45	50	0	348	161	75	72.6
6	Highway 120	West of Austin Road	7,500	84	0	16	2.9%	6.2%	45	60	0	188	87	40	67.4
7	Austin Road	South of Hwy. 120	16,790	84	0	16	2.1%	5.1%	45	60	0	297	138	64	70.4
8	Highway 120	East of Project Entrance	8,420	84	0	16	2.5%	5.1%	45	80	0	189	88	41	65.6

Appendix C-5

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 200701

Description: Global Carrier Trucking Facility - Cumulative no Project

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Button Avenue	North of Hwy. 120	30,700	84	0	16	2.0%	5.0%	40	400	0	382	177	82	59.7
2	Highway 120	East of Hwy. 99	13,200	84	0	16	2.0%	5.0%	35	50	0	187	87	40	68.6
3	Hwy. 99 Off Ramp	South of Hwy. 120	3,750	84	0	16	2.0%	5.0%	65	50	0	179	83	39	68.3
4	Austin Road	North of Hwy. 120	23,900	84	0	16	1.0%	1.0%	45	50	0	270	125	58	71.0
5	Highway 120	East of Austin Road	26,750	84	0	16	2.0%	5.0%	45	50	0	402	187	87	73.6
6	Highway 120	West of Austin Road	6,500	84	0	16	2.0%	5.0%	45	60	0	157	73	34	66.3
7	Austin Road	South of Hwy. 120	22,950	84	0	16	2.0%	5.0%	45	60	0	363	169	78	71.7
8	Highway 120	East of Project Entrance	8,900	84	0	16	2.0%	5.0%	45	80	0	193	90	42	65.7

SAXELBY ACOUSTICS
Acoustics · Noise · Vibration

Appendix C-6

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 200701

Description: Global Carrier Trucking Facility - Cumulative Plus Project

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Button Avenue	North of Hwy. 120	30,820	84	0	16	2.3%	5.4%	40	400	0	394	183	85	59.9
2	Highway 120	East of Hwy. 99	13,220	84	0	16	2.3%	5.4%	35	50	0	194	90	42	68.8
3	Hwy. 99 Off Ramp	South of Hwy. 120	3,770	84	0	16	2.3%	5.5%	65	50	0	183	85	40	68.5
4	Austin Road	North of Hwy. 120	24,020	84	0	16	1.0%	1.0%	45	50	0	271	126	58	71.0
5	Highway 120	East of Austin Road	26,850	84	0	16	2.3%	5.4%	45	50	0	414	192	89	73.8
6	Highway 120	West of Austin Road	6,500	84	0	16	2.9%	6.2%	45	60	0	170	79	37	66.8
7	Austin Road	South of Hwy. 120	23,000	84	0	16	2.1%	5.1%	45	60	0	366	170	79	71.8
8	Highway 120	East of Project Entrance	8,920	84	0	16	2.9%	6.2%	45	80	0	210	97	45	66.3