April 2021

County of Riverside Planning Department
4080 Lemon Street, 12th Floor
Riverside, California

Subject: Stoneridge Commerce Center Specific Plan Alternative Truck Route– Noise Technical Memorandum

PROJECT DESCRIPTION

The Stoneridge Commerce Center Specific Plan Project proposes the construction of the Stoneridge Commerce Center Specific Plan, which includes the development of a 582.6-acre site in the western portion of unincorporated Riverside County (County), California. The Project would primarily be accessed from the Ramona Expressway under the Stoneridge Commerce Center Specific Plan Primary Land Use Plan. The Stoneridge Alternative Truck Route would provide an alternative to this point of access, specifically by altering the Interstate 215 (I-215) southbound truck travel patterns of Project heavy-duty trucks using the Ramona Expressway to access I-215 Freeway/ Placenta Avenue interchange to instead, requiring Project trucks to travel the route of Nuevo Road to San Jacinto Avenue, to the I-215 Freeway/Redlands Avenue interchange.

This Alternative Truck Route Noise Technical Memorandum analyzes the noise that would result from implementation of this Alternative Truck Route. While the Project site is located in unincorporated Riverside County, it is noted that the implementation of the Alternative Truck Route would mainly affect receptors in the City of Perris in terms of the resultant traffic noise. The contribution of noise would come from two main sources: the temporary construction equipment necessary from the recommended roadway improves (addition /widening of traffic lanes and traffic signal installation) and the increase in traffic on area roadways from the use of the Alternative Truck Route.

NOISE ANALYSIS

Fundamentals of Sound and Environmental Noise

Addition of Decibels

The decibel (dB) scale is logarithmic, not linear; therefore, sound levels cannot be added or subtracted through ordinary arithmetic. Two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted (dBA), an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound and twice as loud as a 60-dBA sound. When two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions (Federal Transit Administration [FTA] 2018). For example, a 65-dB source of sound, such as a truck, when joined by another 65-dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB). Under the dB scale, three sources of equal loudness together would produce an increase of 5 dB.

Sound Propagation and Attenuation

Noise can be generated by a number of sources, including mobile sources such as automobiles, trucks and airplanes, and stationary sources such as construction sites, machinery, and industrial operations. Sound spreads (propagates) uniformly outward in a spherical pattern, and the sound level decreases (attenuates) at a rate of approximately 6 dB (dBA) for each doubling of distance from a stationary or point source (FHWA 2017). Sound from a line source, such as a highway, propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of approximately 3 dBA for each doubling of distance from a line source, such as a roadway, depending on ground surface characteristics (Federal Highway Administration [FHWA] 2017). No excess attenuation is assumed for hard surfaces like a parking lot or a body of water. Soft surfaces, such as soft dirt or grass, can absorb sound, so an excess ground-attenuation value of 1.5 dBA per doubling of distance is normally assumed.

Noise levels may also be reduced by intervening structures; generally, a single row of detached buildings between the receptor and the noise source reduces the noise level by about 5 dBA (FHWA 2006), while a solid wall or berm generally reduces noise levels by 10 to 20 dBA (FHWA 2011). However, noise barriers or enclosures specifically designed to reduce site-specific construction noise can provide a sound reduction of 35 dBA or greater (Western Electro-Acoustic Laboratory, Inc. 2000). To achieve the most potent noise-reducing effect, a noise enclosure/barrier must physically fit in the available space, must completely break the "line of sight" between the noise source and the receptors, must be free of degrading holes or gaps, and must not be flanked by nearby reflective surfaces. Noise barriers must be sizable enough to cover the entire noise source and extend length-wise and vertically as far as feasibly possible to be most effective. The limiting factor for a noise barrier is not the component of noise transmitted through the material, but rather the amount of noise flanking around and over the barrier. In general, barriers contribute to decreasing noise levels only when the structure breaks the line of sight between the source and the receiver.

The manner in which older structures in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows (California Department of Transportation [Caltrans] 2002). The exterior-to-interior reduction of newer structures is generally 30 dBA or more (Harris Miller, Miller & Hanson Inc. [HMMH] 2006).

Noise Descriptors

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Several rating scales have been developed to analyze the adverse effect of community noise on people. Because environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise, as well as the time of day when the noise occurs. The L_{eq} is a measure of ambient noise, while the L_{dn} and CNEL (Community Noise Equivalent Level) are measures of community noise. Each is applicable to this analysis and defined as follows:

- **Equivalent Noise Level (L_{eq})** is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.

- **Day-Night Average (L_{dn})** is a 24-hour average L_{eq} with a 10-dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.4 dBA L_{dn}.
- **Community Noise Equivalent Level (CNEL)** is a 24-hour average L_{eq} with a 5-dBA weighting during the hours of 7:00 p.m. to 10:00 p.m. and a 10-dBA weighting added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively.

Human Response to Noise

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

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

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived by humans.
- 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 community response would be expected.
- A 10-dBA change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

Vibration Fundamentals

Ground vibration can be measured several ways to quantify the amplitude of vibration produced. This can be through peak particle velocity or root mean square velocity. These velocity measurements measure maximum particle at one point or the average of the squared amplitude of the signal, respectively.

Vibration impacts on people can be described as the level of annoyance and can vary depending on an individual's sensitivity. Generally, low-level vibrations may cause window rattling but do not pose any threats to the integrity of buildings or structures.

Existing Noise Environment

The most common and significant source of noise in Riverside County is mobile noise generated by transportation-related sources. Other sources of noise are the various land uses (i.e., residential, commercial and institutional) that generate stationary-source noise. The Stoneridge Commerce Center Specific Plan site is bound by Ramona Expressway to the north and Nuevo Road to the south. Both of these are major roadways within the County that serve a wide variety of residential, industrial, agricultural and commercial land uses.

Noise-Sensitive Land Uses

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as parks, historic sites, cemeteries, and recreation areas are considered sensitive to increases in exterior noise levels. Schools, churches, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses.

Regulatory Setting

County of Riverside General Plan Noise Element

The Public Health and Safety Element of the General Plan provides policy direction for minimizing noise impacts in the community and for coordinating with surrounding jurisdictions and other entities regarding noise control. By identifying noise-sensitive land uses and establishing compatibility guidelines for land use and noise, noise considerations will influence the general distribution, location, and intensity of future land use. The result is that effective land use planning and mitigation can alleviate the majority of noise problems. The County of Riverside General Plan does not specify a standard specific to transportation noise, though does seek to protect sensitive residential receptors with a land use compatibility standard of 60 dBA CNEL.

County of Riverside Municipal Code

County regulations with respect to noise can be found in Chapter 9.52, *Noise Regulations*. The County prohibits construction noise between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September, and between the hours of 6:00 p.m. and 7:00 a.m. during the months of October through May.

City of Perris Municipal Code

The Stoneridge Commerce Center Specific Plan site is located in unincorporated Riverside County; however, sensitive receptors located in the City of Perris would be primarily impacted by noise as a result of both the temporary construction equipment necessary to construct the roadway improvements along the Alternative Truck Route and the increase in traffic on the Route . City regulations with respect to noise can be found in Chapter 7.34 of the City of Perris Municipal Code, *Noise Control*. The City of Perris does not currently have regulations specific to transportation noise, though does seek to protect sensitive residential receptors with a land use compatibility standard of 60 dBA CNEL. Additionally, Section 7.34.060 prohibits construction between the hours of 7:00 p.m. and 7:00 a.m. Monday through Saturday and is prohibited on Sundays, Columbus Day and Washington's birthday.

Noise Impacts

Methodology

This analysis of the existing and future noise environments is based on noise prediction modeling. In order to estimate the worst-case construction noise levels that may occur at the nearest noise-sensitive receptors in the vicinity of Alternative Truck Route, predicted construction noise levels were calculated utilizing the FHWA's Roadway Construction Model (2006). Noise as a result of traffic on the Alternative Truck Route was calculated using the FHWA Highway Noise Prediction Model (FHWA-RD-77-108).

Impact Discussion

Construction Noise Impacts

Construction noise associated with the recommended roadway improves would be temporary and would vary depending on the nature of the activities being performed. Noise generated would primarily be associated with the operation of off-road equipment for construction activities. Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g., site preparation, grading and building construction, paving and architectural coating). Noise generated by construction equipment, including excavators, material handlers, and portable generators, can reach high levels. Typical operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Other primary sources of acoustical disturbance would be random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). During construction, exterior noise levels could negatively affect sensitive land uses in the vicinity of the construction site.

Construction noise as associated with the Alternative Truck Route would impact sensitive receptors in the unincorporated County as well as the City of Perris. The County Municipal Code, Chapter 9.52, and the City of Perris Municipal Code, Chapter 7.34, limit the hours that construction can take place but do not promulgate a numeric threshold pertaining to the noise associated with construction. This is due to the fact that construction noise is temporary, short term, intermittent in nature, and would cease on completion of the Project. Furthermore, Riverside County and the City of Perris are developing urban communities and construction noise is generally accepted as a reality within the urban environment.

To estimate the worst-case onsite construction noise levels that may occur at the nearest noise-sensitive receptors in the Alternative Truck Route vicinity, the construction equipment noise levels were calculated using the Roadway Noise Construction Model for the various construction phases for each roadway segment and compared against the construction-related noise level threshold established in the Criteria for a Recommended Standard: Occupational Noise Exposure prepared in 1998 by National Institute for

Occupational Safety and Health (NIOSH). A division of the US Department of Health and Human Services, NIOSH identifies a noise level threshold based on the duration of exposure to the source. The NIOSH construction-related noise level threshold starts at 85 dBA for more than 8 hours per day; for every 3-dBA increase, the exposure time is cut in half. This reduction results in noise level thresholds of 88 dBA for more than 4 hours per day, 92 dBA for more than 1 hour per day, 96 dBA for more than 30 minutes per day, and up to 100 dBA for more than 15 minutes per day. For the purposes of this analysis, the lowest, more conservative threshold of 85 dBA L_{eq} is used as an acceptable threshold for construction noise at the nearby existing and future planned sensitive receptors. This methodology for evaluating construction noise that is exempt from local standards is consistent with the California Court of Appeal decision found in *King and Gardiner Farms, LLC, v. County of Kern* (2020).

The intersections with proposed improvements associated with the Alternative Truck Route analyzed in this analysis include Antelope Road and Nuevo Road, Dunlap Drive and San Jacinto Avenue, and Redlands Avenue and San Jacinto Avenue. The sensitive receptors that could be impacted by construction-related noise involving the intersection at Antelope Road/Nuevo Road and the intersection at Dunlap Drive/San Jacinto Avenue intersection are located in unincorporated Riverside County. The sensitive receptors that could be impacted by construction-related noise involving the intersection at Redlands Avenue/San Jacinto Avenue are located in the City of Perris.

The anticipated short-term construction noise levels generated for the recommended roadway improves are presented in Table 1. Consistent with FTA recommendations for calculating construction noise, construction noise was measured from the center of the Alternative Truck Route site (FTA 2018).

Table 1. Construction Average (dBA) Noise Levels by Receptor Distance and Construction Equipment				
Equipment	**Distance to Closest Residence**	**Estimated Exterior Construction Noise Level @ Closest Residence**	**Construction Noise Standard (dBA L_{eq})**	**Exceeds Standards?**
Antelope Road & Nuevo Road Intersection *Proposed Improvements: Instillation of traffic signal and addition of traffic lanes*				
Paver (1)	3,000 feet	38.6	*85*	**No**
Roller (1)		37.4	*85*	**No**
Excavator (1)		41.2	*85*	**No**
Crane (1)		37.0	*85*	**No**
Tractor (1)		44.5	*85*	**No**
Air Compressor (1)		38.1	*85*	**No**
Combined Construction Equipment		**48.2**	*85*	**No**
Dunlap Drive & San Jacinto Avenue Intersection *Proposed Improvements: Instillation of traffic signal and addition of traffic lanes*				
Paver (1)	2,500 feet	40.2	*85*	**No**
Roller (1)		39.0	*85*	**No**
Excavator (1)		42.8	*85*	**No**
Crane (1)		38.6	*85*	**No**
Tractor (1)		46.0	*85*	**No**
Air Compressor (1)		39.7	*85*	**No**
Combined Construction Equipment		**49.7**	*85*	**No**
Redlands Avenue & San Jacinto Avenue Intersection *Proposed Improvements: Modification of traffic signal and addition of traffic lanes*				
Paver (1)	600 feet	52.6	*85*	**No**
Roller (1)		51.4	*85*	**No**
Excavator (1)		55.1	*85*	**No**
Crane (1)		51.0	*85*	**No**
Tractor (1)		58.4	*85*	**No**
Air Compressor (1)		52.1	*85*	**No**
Combined Construction Equipment		**62.1**	*85*	**No**

Source: Construction noise levels were calculated by ECORP Consulting using the FHWA Roadway Noise Construction Model (FHWA 2006). Refer to Attachment A for Model Data Outputs.

Notes: Construction equipment used during construction activities derived from a previous roadway improvement project were an equipment list was provided.

L_{eq} = The equivalent energy noise level, is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.

As shown in Table 1, no individual or cumulative pieces of construction equipment would exceed the 85 dBA NIOSH construction noise standard at any nearby noise-sensitive receptors during roadway improvements.

Traffic (Mobile) Noise Impacts

Implementation of the Alternative Truck Route would result in additional traffic on area roadways, thereby increasing vehicular noise in the vicinity. Existing roadway noise levels and noise levels under year 2030 conditions as a result of the Alternative Truck Route were calculated for the roadway segments in the vicinity. Only roadway segments that would be used by the Alternative Truck Route and that traverse noise sensitive receptors were analyzed in this technical noise memorandum. This task was accomplished using the FHWA Highway Traffic Noise Prediction Model (FHWA-RD-77-108) (see Attachment B) and traffic volumes from the Traffic Impact Analysis prepared for the Alternative Truck Route (Urban Crossroads 2021). The average vehicle noise rates (energy rates) used in the FHWA model have been modified to reflect average vehicle noise rates identified for California by Caltrans. The Caltrans data shows that California automobile noise is 0.8 to 1.0 dBA higher than national levels and that medium and heavy truck noise is 0.3 to 3.0 dBA lower than national levels. The average daily noise levels along these roadway segments are presented in Table 2. Vicinity roadways span multiple jurisdictions, which are noted in Table 2.

The calculated noise levels are compared to the noise standards promulgated in the County of Riverside, and significance thresholds recommended by FICON with consideration of the City of Perris various protective limits to exterior noise at residences, where applicable.

FICON's measure of substantial increase for transportation noise exposure is as follows:

- If the existing ambient noise levels at existing and future noise-sensitive land uses (e.g. residential, etc.) are less than 60 dBA CNEL and the Project creates a readily perceptible 5 dBA CNEL or greater Project-related noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or
- If the existing noise levels range from 60 to 65 dBA CNEL and the Project creates a barely perceptible 3 dBA CNEL or greater Project-related noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or
- If the existing noise levels already exceed 65 dBA CNEL, and the Project creates a community noise level increase of greater than 1.5 dBA CNEL

Table 2. Existing and Predicted Traffic Noise Levels

Roadway Segment	Surrounding Uses	CNEL at 100 feet from Centerline of Roadway		Noise Standard (dBA CNEL)	Exceed Standard AND result in Noise Levels Exceeding Acceptable Exterior Noise Standards
		Existing Conditions	Existing + Project Conditions (EAPC 2030)		
Nuevo Road					
Between the Stoneridge Commerce Center Specific Plan Entrance and Dunlap Drive	Residential and Undeveloped Land	60.0	65.0	*>3*	**Yes**
Between Dunlap Drive and Evans Road (City of Perris)	Residential and Undeveloped Land	59.0	63.9	*>5*	**No**
Dunlap Drive					
North of Nuevo Road (City of Perris)	Residential	53.7	54.4	*>5*	**No**
Between Nuevo Road and San Jacinto Avenue (City of Perris)	Residential and Undeveloped Land	51.5	53.6	*>5*	**No**
San Jacinto Avenue					
Between Murrieta Road and Redlands Avenue (City of Perris)	Residential and Commercial	60.4	62.7	*>3*	**No**
West of Redlands Avenue (City of Perris)	Residential and Commercial	55.2	58.5	*>5*	**No**

Source: Traffic noise levels were calculated by ECORP Consulting using the FHWA roadway noise prediction model in conjunction with the trip generation rate identified by Urban Crossroads 2021. Refer to Attachment B for traffic noise modeling assumptions and results.
Notes: Only roadway segments used for the Alternative Truck Route and that impact sensitive receptors were included for the purposes of this analysis.

As shown in Table 2, the segment of Nuevo Road between the Stoneridge Commerce Center Specific Plan site entrance and Dunlap Drive, located in unincorporated Riverside County, which currently experiences traffic noise levels of 60 dBA, would experience an increase of more than 3.0 dBA CNEL over this existing condition as a result of the Alternative Truck Route and would exceed the County residential noise threshold of 60 dBA. Noise generated on this roadway would exceed the applicable noise standards. No other roadway segments would generate an increase of noise beyond both the FICON significance standards and acceptable exterior noise standards.

REFERENCES

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FTA (Federal Transit Administration). 2018. Transit Noise and Vibration Impact Assessment.

Western Electro-Acoustic Laboratory, Inc. 2000. Sound Transmission Sound Test Laboratory Report No. TL 96-186.

ATTACHMENT A

Federal Highway Administration Highway Roadway Construction Noise Model – Alternative Truck Route Construction Noise

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/25/2021
Case Description: Antelope Road & Nuevo Road

Description	**Affected Land Use**
Antelope Road & Nuevo Road	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Paver	No	50		77.2	3000
Roller	No	20		80	3000
Excavator	No	40		80.7	3000
Crane	No	16		80.6	3000
Tractor	No	40	84		3000
Compressor (air)	No	40		77.7	3000

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Paver		41.7	38.6
Roller		44.4	37.4
Excavator		45.1	41.2
Crane		45	37
Tractor		48.4	44.5
Compressor (air)		42.1	38.1
	Total	**48.4**	**48.2**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/25/2021
Case Description: Dunlap Drive & San Jacinto Avenue

Description	**Affected Land Use**
Dunlap Drive & San Jacinto Avenue	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Paver	No	50		77.2	2500
Roller	No	20		80	2500
Excavator	No	40		80.7	2500
Crane	No	16		80.6	2500
Tractor	No	40	84		2500
Compressor (air)	No	40		77.7	2500

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Paver		43.2	40.2
Roller		46	39
Excavator		46.7	42.8
Crane		46.6	38.6
Tractor		50	46
Compressor (air)		43.7	39.7
	Total	**50**	**49.7**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/25/2021
Case Description: Redlands Avenue & San Jacinto Avenue

Description	**Affected Land Use**
Redlands Avenue & San Jacinto Avenue	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Paver	No	50		77.2	600
Roller	No	20		80	600
Excavator	No	40		80.7	600
Crane	No	16		80.6	600
Tractor	No	40	84		600
Compressor (air)	No	40		77.7	600

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Paver		55.6	52.6
Roller		58.4	51.4
Excavator		59.1	55.1
Crane		59	51
Tractor		62.4	58.4
Compressor (air)		56.1	52.1
	Total	**62.4**	**62.1**

*Calculated Lmax is the Loudest value.

ATTACHMENT B

Highway Noise Prediction Model (FHWA-RD-77-108) Outputs – Alternative Truck Route Traffic Noise

TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Project Number: 2019-075
Project Name: Stoneridge

Background Information

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes: Darnell & Associates 2020
Community Noise Descriptor: L_{dn}: ____ CNEL: x

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

Analysis Condition Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Vehicle Mix: Medium Trucks	Vehicle Mix: Heavy Trucks	CNEL at 100 Feet	Distance from Centerline of Roadway / Distance to Contour: 70 CNEL	65 CNEL	60 CNEL	55 CNEL	Calc Dist
Existing													
Nuevo Road													
Between the Project site and Dunlap Drive	2	0	4,608	55	0.5	1.8%	0.7%	**60.0**	-	47	100	216	100
Between Dunlap Drive and Evans Road	2	0	3,645	55	0.5	1.8%	0.7%	**59.0**	-	40	86	185	100
Dunlap Drive													
North of Nuevo Road	2	0	1,755	45	0.5	1.8%	0.7%	**53.7**	-	-	38	82	100
Between Nuevo Road and San Jacinto Avenue	2	0	1,071	45	0.5	1.8%	0.7%	**51.5**	-	-	-	59	100
San Jacinto Avenue													
Between Murrieta Road and Redlands Avenue	2	0	5,008	55	0.5	1.8%	0.7%	**60.4**	-	49	106	229	100
West of Redlands Avenue	2	0	1,530	55	0.5	1.8%	0.7%	**55.2**	-	-	48	104	100

TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Project Number: 2019-075
Project Name: Stoneridge

Background Information

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes: Darnell & Associates 2020
Community Noise Descriptor: L_{dn}: ____ CNEL: x

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

Analysis Condition Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	CNEL at 100 Feet	Distance from Centerline of Roadway 70 CNEL	Distance to Contour 65 CNEL	60 CNEL	55 CNEL	Calc Dist
Existing+ Project													
Nuevo Road													
Between the Project site and Dunlap Drive	2	0	14,409	55	0.5	1.8%	0.7%	**65.0**	46	100	215	463	100
Between Dunlap Drive and Evans Road	2	0	11,142	55	0.5	1.8%	0.7%	**63.9**	39	84	181	390	100
Dunlap Drive													
North of Nuevo Road	2	0	2,061	45	0.5	1.8%	0.7%	**54.4**	-	-	42	91	100
Between Nuevo Road and San Jacinto Avenue	2	0	1,714	45	0.5	1.8%	0.7%	**53.6**	-	-	37	80	100
San Jacinto Avenue													
Between Murrieta Road and Redlands Avenue	2	0	8,473	55	0.5	1.8%	0.7%	**62.7**	32	70	151	325	100
West of Redlands Avenue	2	0	3,258	55	0.5	1.8%	0.7%	**58.5**	-	37	80	172	100