Appendix G Noise Background and Modeling Data

Appendix

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Fundamentals of Noise

NOISE

Noise is most often defined as unwanted sound; whether it is loud, unpleasant, unexpected, or otherwise undesirable. Although sound can be easily measured, the perception of noise and the physical response to sound complicate the analysis of its impact on people. People judge the relative magnitude of sound sensation in subjective terms such as "noisiness" or "loudness."

Noise Descriptors

The following are brief definitions of terminology used in this chapter:

- **Sound.** A disturbance created by a vibrating object, which, when transmitted by pressure waves through a medium such as air, is capable of being detected by a receiving mechanism, such as the human ear or a microphone.
- **Noise.** Sound that is loud, unpleasant, unexpected, or otherwise undesirable.
- **Decibel (dB).** A unitless measure of sound, expressed on a logarithmic scale and with respect to a defined reference sound pressure. The standard reference pressure is 20 micropascals (20 μPa).
- **A-Weighted Decibel (dBA).** An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
- **Equivalent Continuous Noise Level (L_{eq}); also called the Energy-Equivalent Noise Level.** The value of an equivalent, steady sound level which, in a stated time period (often over an hour) and at a stated location, has the same A-weighted sound energy as the time-varying sound. Thus, the L_{eq} metric is a single numerical value that represents the equivalent amount of variable sound energy received by a receptor over the specified duration.
- **Statistical Sound Level (L_n).** The sound level that is exceeded "n" percent of time during a given sample period. For example, the L_{50} level is the statistical indicator of the time-varying noise signal that is exceeded 50 percent of the time (during each sampling period); that is, half of the sampling time, the changing noise levels are above this value and half of the time they are below it. This is called the "median sound level." The L_{10} level, likewise, is the value that is exceeded 10 percent of the time (i.e., near the maximum) and this is often known as the "intrusive sound level." The L_{90} is the sound level exceeded 90 percent of the time and is often considered the "effective background level" or "residual noise level."
- **Maximum Sound Level (L_{max}).** The highest RMS sound level measured during the measurement period.
- **Root Mean Square Sound Level (RMS).** The square root of the average of the square of the sound pressure over the measurement period.

- **Day-Night Sound Level (L_{dn} or DNL).** The energy-average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the sound levels occurring during the period from 10:00 PM to 7:00 AM.

- **Community Noise Equivalent Level (CNEL).** The energy average of the A-weighted sound levels occurring during a 24-hour period, with 5 dB added from 7:00 PM to 10:00 PM and 10 dB from 10:00 PM to 7:00 AM. NOTE: For general community/environmental noise, CNEL and L_{dn} values rarely differ by more than 1 dB (with the CNEL being only slightly more restrictive – that is, higher than the L_{dn} value). As a matter of practice, L_{dn} and CNEL values are interchangeable and are treated as equivalent in this assessment.

- **Peak Particle Velocity (PPV).** The peak rate of speed at which soil particles move (e.g., inches per second) due to ground vibration.

- **Sensitive Receptor.** Noise- and vibration-sensitive receptors include land uses where quiet environments are necessary for enjoyment and public health and safety. Residences, schools, motels and hotels, libraries, religious institutions, hospitals, and nursing homes are examples.

Characteristics of Sound

When an object vibrates, it radiates part of its energy in the form of a pressure wave. Sound is that pressure wave transmitted through the air. Technically, airborne sound is a rapid fluctuation or oscillation of air pressure above and below atmospheric pressure that creates sound waves.

Sound can be described in terms of amplitude (loudness), frequency (pitch), or duration (time). Loudness or amplitude is measured in dB, frequency or pitch is measured in Hertz [Hz] or cycles per second, and duration or time variations is measured in seconds or minutes.

Amplitude

Unlike linear units such as inches or pounds, decibels are measured on a logarithmic scale. Because of the physical characteristics of noise transmission and perception, the relative loudness of sound does not closely match the actual amounts of sound energy. Table 1 presents the subjective effect of changes in sound pressure levels. Ambient sounds generally range from 30 dBA (very quiet) to 100 dBA (very loud). Changes of 1 to 3 dB are detectable under quiet, controlled conditions, and changes of less than 1 dB are usually not discernible (even under ideal conditions). A 3 dB change in noise levels is considered the minimum change that is detectable with human hearing in outside environments. A change of 5 dB is readily discernible to most people in an exterior environment, and a 10 dB change is perceived as a doubling (or halving) of the sound.

Table 1 Noise Perceptibility

Change in dB	Noise Level
± 3 dB	Barely perceptible increase
± 5 dB	Readily perceptible increase
± 10 dB	Twice or half as loud
± 20 dB	Four times or one-quarter as loud

Source: California Department of Transportation (Caltrans). 2013, September. Technical Noise Supplement ("TeNS").

Frequency

The human ear is not equally sensitive to all frequencies. Sound waves below 16 Hz are not heard at all, but are "felt" more as a vibration. Similarly, though people with extremely sensitive hearing can hear sounds as high as 20,000 Hz, most people cannot hear above 15,000 Hz. In all cases, hearing acuity falls off rapidly above about 10,000 Hz and below about 200 Hz.

When describing sound and its effect on a human population, A-weighted (dBA) sound levels are typically used to approximate the response of the human ear. The A-weighted noise level has been found to correlate well with people's judgments of the "noisiness" of different sounds and has been used for many years as a measure of community and industrial noise. Although the A-weighted scale and the energy-equivalent metric are commonly used to quantify the range of human response to individual events or general community sound levels, the degree of annoyance or other response also depends on several other perceptibility factors, including:

- Ambient (background) sound level
- General nature of the existing conditions (e.g., quiet rural or busy urban)
- Difference between the magnitude of the sound event level and the ambient condition
- Duration of the sound event
- Number of event occurrences and their repetitiveness
- Time of day that the event occurs

Duration

Time variation in noise exposure is typically expressed in terms of a steady-state energy level equal to the energy content of the time varying period (called L_{eq}), or alternately, as a statistical description of the sound level that is exceeded over some fraction of a given observation period. For example, the L_{50} noise level represents the noise level that is exceeded 50 percent of the time; half the time the noise level exceeds this level and half the time the noise level is less than this level. This level is also representative of the level that is exceeded 30 minutes in an hour. Similarly, the L_2, L_8 and L_{25} values represent the noise levels that are exceeded 2, 8, and 25 percent of the time or 1, 5, and 15 minutes per hour, respectively. These "n" values are typically used to demonstrate compliance for stationary noise sources with many cities' noise ordinances. Other values typically noted during a noise survey are the L_{min} and L_{max}. These values represent the minimum and maximum root-mean-square noise levels obtained over the measurement period, respectively.

Because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, state law and many local jurisdictions use an adjusted 24-hour noise descriptor called the Community Noise Equivalent Level (CNEL) or Day-Night Noise Level (L_{dn}). The CNEL descriptor requires that an artificial increment (or "penalty") of 5 dBA be added to the actual noise level for the hours from 7:00 PM to 10:00 PM and 10 dBA for the hours from 10:00 PM to 7:00 AM. The L_{dn} descriptor uses the same methodology except that there is no artificial increment added to the hours between 7:00 PM and 10:00 PM. Both descriptors give roughly the same 24-hour level, with the CNEL being only slightly more restrictive (i.e., higher). The CNEL or L_{dn} metrics are commonly applied to the assessment of roadway and airport-related noise sources.

Sound Propagation

Sound dissipates exponentially with distance from the noise source. This phenomenon is known as "spreading loss." For a single-point source, sound levels decrease by approximately 6 dB for each doubling of distance from the source (conservatively neglecting ground attenuation effects, air absorption factors, and barrier shielding). For example, if a backhoe at 50 feet generates 84 dBA, at 100 feet the noise level would be 79 dBA, and at 200 feet it would be 73 dBA. This drop-off rate is appropriate for noise generated by on-site operations from stationary equipment or activity at a project site. If noise is produced by a line source, such as highway traffic, the sound decreases by 3 dB for each doubling of distance over a reflective ("hard site") surface such as concrete or asphalt. Line source noise in a relatively flat environment with ground-level absorptive vegetation decreases by an additional 1.5 dB for each doubling of distance.

Psychological and Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects the entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions, thereby affecting blood pressure and functions of the heart and the nervous system. Extended periods of noise exposure above 90 dBA results in permanent cell damage, which is the main driver for employee hearing protection regulations in the workplace. For community environments, the ambient or background noise problem is widespread, through generally worse in urban areas than in outlying, less-developed areas. Elevated ambient noise levels can result in noise interference (e.g., speech interruption/masking, sleep disturbance, disturbance of concentration) and cause annoyance. Since most people do not routinely work with decibels or A-weighted sound levels, it is often difficult to appreciate what a given sound pressure level number means. To help relate noise level values to common experience, Table 2 shows typical noise levels from familiar sources.

Table 2 Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Onset of physical discomfort	120+	
	110	Rock Band (near amplification system)
Jet Flyover at 1,000 feet		
	100	
Gas Lawn Mower at three feet		
	90	
Diesel Truck at 50 feet, at 50 mph		Food Blender at 3 feet
	80	Garbage Disposal at 3 feet
Noisy Urban Area, Daytime		
	70	Vacuum Cleaner at 10 feet
Commercial Area		Normal speech at 3 feet
Heavy Traffic at 300 feet	60	
		Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (background)
Quiet Suburban Nighttime		
	30	Library
Quiet Rural Nighttime		Bedroom at Night, Concert Hall (background)
	20	
		Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: California Department of Transportation (Caltrans). 2013, September. Technical Noise Supplement (“TeNS”).

Vibration Fundamentals

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 is normally associated with activities stemming from operations of railroads or vibration-intensive stationary sources, but can also be associated with construction equipment such as jackhammers, pile drivers, and hydraulic hammers. As with noise, vibration can be described by both its amplitude and frequency. Vibration displacement is the distance that a point on a surface moves away from its original static position; velocity is the instantaneous speed that a point on a surface moves; and acceleration is the rate of change of the speed. Each of these descriptors can be used to correlate vibration to human response, building damage, and acceptable equipment vibration levels. During construction, the operation of construction equipment can cause groundborne vibration. During the operational phase of a project, receptors may be subject to levels of vibration that can cause annoyance due to noise generated from vibration of a structure or items within a structure.

Vibration amplitudes are usually described in terms of either the peak particle velocity (PPV) or the root mean square (RMS) velocity. PPV is the maximum instantaneous peak of the vibration signal and RMS is the square root of the average of the squared amplitude of the signal. PPV is more appropriate for evaluating potential building damage and RMS is typically more suitable for evaluating human response.

As with airborne sound, annoyance with vibrational energy is a subjective measure, depending on the level of activity and the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Persons accustomed to elevated ambient vibration levels, such as in an urban environment, may tolerate higher vibration levels. Table 3 displays the human response and the effects on buildings resulting from continuous vibration (in terms of various levels of PPV).

Table 3 Human Reaction to Typical Vibration Levels

Vibration Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.006–0.019	Threshold of perception, possibility of intrusion	Vibrations unlikely to cause damage of any type
0.08	Vibrations readily perceptible	Recommended upper level of vibration to which ruins and ancient monuments should be subjected
0.10	Level at which continuous vibration begins to annoy people	Virtually no risk of “architectural” (i.e. not structural) damage to normal buildings
0.20	Vibrations annoying to people in buildings	Threshold at which there is a risk to “architectural” damage to normal dwelling – houses with plastered walls and ceilings
0.4–0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause “architectural” damage and possibly minor structural damage

Source: California Department of Transportation (Caltrans). 2020, April. *Transportation and Construction Vibration Guidance Manual.* Prepared by ICF International.

LOCAL REGULATIONS AND STANDARDS

18.42.040 - Noise.

The maximum sound level radiated by any Use of Facility, when measured at the boundary line of the Property on which the sound is generated, Shall not be obnoxious by reason of its intensity, pitch or dynamic characteristics as determined by the City, and Shall not exceed 65 dBA.

(Ord. 0-14-92 § 1 (Exh. A) (part), 1992)

18.42.050 - Vibration.

All activities Shall be operated so as not to generate ground vibration by equipment other than motor Vehicles, trains or by temporary construction or Demolition, which is perceptible without instruments by the average Person at or beyond any Lot Line of the Lot containing the activities.

(Ord. 0-14-92 § 1 (Exh. A) (part), 1992)

CONSTRUCTION NOISE MODELING

COCL-05 Construction Noise Modeling Attenuation Calculations

		Levels in dBA Leq			
Phase	**RCNM Reference Noise Level**	**California Preperatory College to north**	**Residences to east**	**Summit College to northwest**	
Distance in feet	*50*	*275*	*375*	*680*	
Site Prep	84	69	67	61	
Rough Grading	82	68	65	60	
Fine Grading	83	68	65	60	
Distance in feet	*50*	*215*	*290*	*600*	
Building Construction	83	70	67	61	
Architectural Coating	74	61	58	52	
Distance in feet	*50*	*135*	*145*	*500*	
Paving	84	75	74	64	
Distance in feet	*50*	*150*	*50*	*275*	
Finish and Landscaping	77	67	77	62	

Attenuation calculated through Inverse Square Law: Lp(R2) = Lp(R1) - 20Log(R2/R1)

COCL-05 Vibration Damage Attenuation Calculations

Levels in in/sec PPV

Distance in feet	**Vibration Reference Level at *25 feet***	**Residential to east** *10*	**Residential to east** *15*	**Commerical to South** *70*
Vibratory Roller	0.21	0.830	0.452	0.045
Static Roller**	0.05	0.198	0.108	0.011
Clam shovel	0.202	0.798	0.435	0.043
Hoe Ram	0.089	0.352	0.191	0.019
Large Bulldozer	0.089	0.352	0.191	0.019
Caisson Drilling	0.089	0.352	0.191	0.019
Loaded Trucks	0.076	0.300	0.164	0.016
Jackhammer	0.035	0.138	0.075	0.007
Small Bulldozer	0.003	0.012	0.006	0.001

***New Zealand Transport Agency 2012.*

TRAFFIC NOISE INCREASE CALCULATIONS

Traffic Noise Calculator: FHWA 77-108 **Project Title: Existing COCL-05**

	Output						Inputs													
	dBA at 50 feet			Distance to CNEL Contour																
ID	$L_{eq-24hr}$	L_{dn}	CNEL	70 dBA	65 dBA	60 dBA	Roadway	Segment	ADT	Posted Speed Limit	Grade	% Autos	% Med Trucks	% Heavy Trucks	% Daytime	% Evening	% Night	Number of Lanes	Site Condition	Distance to Reciever
1	83.1	85.9	86.6	636	1370	2951	Interstate 215 – north of Washington Street		200,000	65	0.0%	93.3%	2.9%	3.8%	75.0%	15.0%	10.0%	6	Soft	50
2	82.8	85.6	86.2	606	1305	2811	Interstate 215 – south of State Route 10		186,000	65	0.0%	93.3%	2.9%	3.8%	75.0%	15.0%	10.0%	6	Soft	50

COCL-05

Traffic Noise Calculations

Roadway Segment	Peak Hour Volumes: Year 2020	Peak Hour Volumes: 1 percent growth rate to year 2021
Santo Antonio - north of Washington	319	322
Santo Antonio - south of Washington	317	320
Washington - east of Santo Antonio	552	558
Washington - west of Santo Antonio	420	424

Roadway Segment	Year 2006	1 percent growth rate to year 2021
S. Mt. Vernon - north and south of Santo Antonio	1759	2042

COUNTS UNLIMITED INC.
25424 JACLYN AVENUE
MORENO VALLEY, CA 92557
951-247-6716

CITY OF COLTON
MT. VERNON AVENUE
S/ SAN ANTONIO DRIVE
48 HOUR DIRECTIONAL VOLUME COUNT

COLTON 21
Site Code: 041964146
Date Start: 20-Jun-06
Date End: 21-Jun-06

Start	20-Jun-06	NORTHBOUND		Hour Totals		SOUTHBOUND		Hour Totals		Combined Totals	
Time	Tue	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		32	**229**			14	217				
12:15		29	**264**			25	184				
12:30		14	**215**			13	216				
12:45		26	**236**	101	944	14	160	66	777	167	1721
01:00		7	174			8	189				
01:15		19	191			16	176				
01:30		5	213			18	175				
01:45		6	174	37	752	14	183	56	723	93	1475
02:00		11	184			16	169				
02:15		20	168			7	152				
02:30		26	164			13	151				
02:45		9	155	66	671	14	172	50	644	116	1315
03:00		2	173			19	174				
03:15		7	164			6	149				
03:30		7	147			16	207				
03:45		13	145	29	629	9	178	50	708	79	1337
04:00		10	143			21	179				
04:15		19	136			27	185				
04:30		35	147			29	214				
04:45		45	127	109	553	24	**195**	101	773	210	1326
05:00		45	151			9	**216**				
05:15		62	139			22	**187**				
05:30		104	145			31	**217**				
05:45		83	140	294	575	55	190	117	810	411	1385
06:00		46	130			47	177				
06:15		56	114			48	130				
06:30		103	112			50	129				
06:45		132	121	337	477	55	119	200	555	537	1032
07:00		140	114			86	95				
07:15		153	103			106	101				
07:30		167	79			103	89				
07:45		211	82	671	378	144	113	439	398	1110	776
08:00		234	86			146	123				
08:15		195	94			112	90				
08:30		135	85			100	83				
08:45		158	83	722	348	146	77	504	373	1226	721
09:00		188	95			120	117				
09:15		139	79			96	81				
09:30		141	76			140	79				
09:45		189	84	657	334	123	73	479	350	1136	684
10:00		169	65			107	67				
10:15		157	50			132	46				
10:30		170	53			142	54				
10:45		178	39	674	207	128	27	509	194	1183	401
11:00		**195**	42			**171**	14				
11:15		**194**	24			**178**	35				
11:30		**199**	29			**223**	22				
11:45		**233**	22	821	117	**189**	14	761	85	1582	202
Total		4518	5985	4518	5985	3332	6390	3332	6390	7850	12375
Combined Total		10503		10503		9722		9722		20225	
AM Peak		11:00				11:00					
Vol.		821				761					
P.H.F.		0.877				0.853					
PM Peak			12:00				04:45				
Vol.			944				815				
P.H.F.			0.894				0.939				
Percentage		43.0%	57.0%			34.3%	65.7%				

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CITY OF COLTON
MT. VERNON AVENUE
S/ SAN ANTONIO DRIVE
48 HOUR DIRECTIONAL VOLUME COUNT

COLTON 21
Site Code: 041964146
Date Start: 20-Jun-06
Date End: 21-Jun-06

Start	21-Jun-06	NORTHBOUND		Hour Totals		SOUTHBOUND		Hour Totals		Combined Totals	
Time	Wed	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		16	179			18	208				
12:15		23	190			13	153				
12:30		19	**202**			14	188				
12:45		14	**193**	72	764	20	168	65	717	137	1481
01:00		20	**185**			10	200				
01:15		19	**209**			12	159				
01:30		11	185			15	180				
01:45		7	185	57	764	17	165	54	704	111	1468
02:00		12	140			12	164				
02:15		17	179			6	128				
02:30		8	152			16	182				
02:45		9	189	46	660	11	176	45	650	91	1310
03:00		5	153			17	169				
03:15		7	157			6	159				
03:30		18	158			8	176				
03:45		9	163	39	631	14	176	45	680	84	1311
04:00		14	153			17	203				
04:15		21	141			16	156				
04:30		32	126			21	**190**				
04:45		45	138	112	558	17	**169**	71	718	183	1276
05:00		31	151			23	**237**				
05:15		66	145			20	**176**				
05:30		84	127			31	180				
05:45		81	137	262	560	39	151	113	744	375	1304
06:00		49	128			57	147				
06:15		55	100			29	136				
06:30		89	119			51	128				
06:45		132	98	325	445	50	120	187	531	512	976
07:00		126	107			52	122				
07:15		135	88			92	104				
07:30		**195**	78			102	103				
07:45		**221**	105	677	378	135	96	381	425	1058	803
08:00		**206**	75			136	92				
08:15		**180**	87			104	98				
08:30		151	72			83	77				
08:45		152	106	689	340	100	84	423	351	1112	691
09:00		121	93			123	64				
09:15		127	71			127	75				
09:30		133	62			152	66				
09:45		158	75	539	301	130	78	532	283	1071	584
10:00		148	52			115	64				
10:15		141	59			118	63				
10:30		134	60			102	20				
10:45		125	37	548	208	140	25	475	172	1023	380
11:00		156	35			**158**	20				
11:15		131	26			**153**	30				
11:30		168	25			**197**	18				
11:45		171	27	626	113	**187**	17	695	85	1321	198
Total		3992	5722	3992	5722	3086	6060	3086	6060	7078	11782
Combined Total		9714		9714		9146		9146		18860	
AM Peak		07:30				11:00					
Vol.		802				695					
P.H.F.		0.907				0.882					
PM Peak			00:30				04:30				
Vol.			789				772				
P.H.F.			0.944				0.814				
Percentage		41.1%	58.9%			33.7%	66.3%				
ADT/AADT		ADT 19,543		AADT 19,543							

Intersection Level Of Service Report
Intersection 2: Santo Antonio Drive at Washington Street

Control Type:	All-way stop	Delay (sec / veh):	10.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.337

Intersection Setup

Name	Santo Antonio Drive			Santo Antonio Drive			Washington Street			Washington Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00			25.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Santo Antonio Drive			Santo Antonio Drive			Washington Street			Washington Street		
Base Volume Input [veh/h]	17	48	129	34	44	69	65	123	9	70	137	59
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	17	48	129	34	44	69	65	123	9	70	137	59
Peak Hour Factor	0.8890	0.8890	0.8890	0.8890	0.8890	0.8890	0.8890	0.8890	0.8890	0.8890	0.8890	0.8890
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	13	36	10	12	19	18	35	3	20	39	17
Total Analysis Volume [veh/h]	19	54	145	38	49	78	73	138	10	79	154	66
Pedestrian Volume [ped/h]	0			0			0			0		