Appendix I

Environmental Noise & Vibration Assessment

The Preserve Residential Development

Rancho Cordova, California

BAC Job # 2019-085

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Introduction

The proposed The Preserve Residential Development (project) is located north of Douglas Road, in between Security Park Drive and Raymer Way in Rancho Cordova, California. The project proposes the development of 434 single-family residential lots, public parks, and preserve area on a currently undeveloped 284-acre parcel. The proposed development is located within the Sunrise Douglas Community Plan. Existing land uses in the project vicinity include residential to the south, undeveloped residential to the west, and agricultural to the north and east. The project site location and site plan are shown on Figures 1 and 2, respectively.

The purposes of this assessment are to quantify the existing noise and vibration environments, identify potential noise and vibration impacts resulting from the project, identify appropriate mitigation measures, and provide quantitative and qualitative analyses of impacts associated with the project. Specifically, impacts are identified if project-related activities would cause a substantial increase in ambient noise or vibration levels at existing sensitive uses in the project vicinity, or if traffic or project generated noise or vibration levels would exceed applicable Rancho Cordova standards at existing or proposed sensitive uses within the project vicinity.

Noise and Vibration Fundamentals

Noise

Noise is often described as unwanted sound. Sound is defined as any pressure variation in air that the human ear can detect. If the pressure variations occur frequently enough (at least 20 times per second), they can be heard and are designated as sound. The number of pressure variations per second is called the frequency of sound and is expressed as cycles per second, or Hertz (Hz). Definitions of acoustical terminology are provided in Appendix A.

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 of pressure) as a point of reference, defined as 0 dB. Other sound pressures are then compared to the 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. Another useful aspect of the decibel scale is that changes in decibel levels correspond closely to human perception of relative loudness. Noise levels associated with common noise sources are provided in Figure 3.

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 filtering the frequency response of a sound level meter by means of the standardized A-weighting network. There is a strong correlation between A-weighted sound levels (expressed as dBA) and community response to noise. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels.

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 noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}). The L_{eq} is the foundation of the day-night average noise descriptor, DNL (or L_{dn}), and shows very good correlation with community response to noise.

The day-night average sound level (DNL) is based on the average noise level over a 24-hour day, with a +10-decibel weighting applied to noise occurring during nighttime (10:00 PM to 7:00 AM) hours. The nighttime penalty is based on the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because DNL represents a 24-hour average, it tends to disguise short-term variations in the noise environment.

Vibration

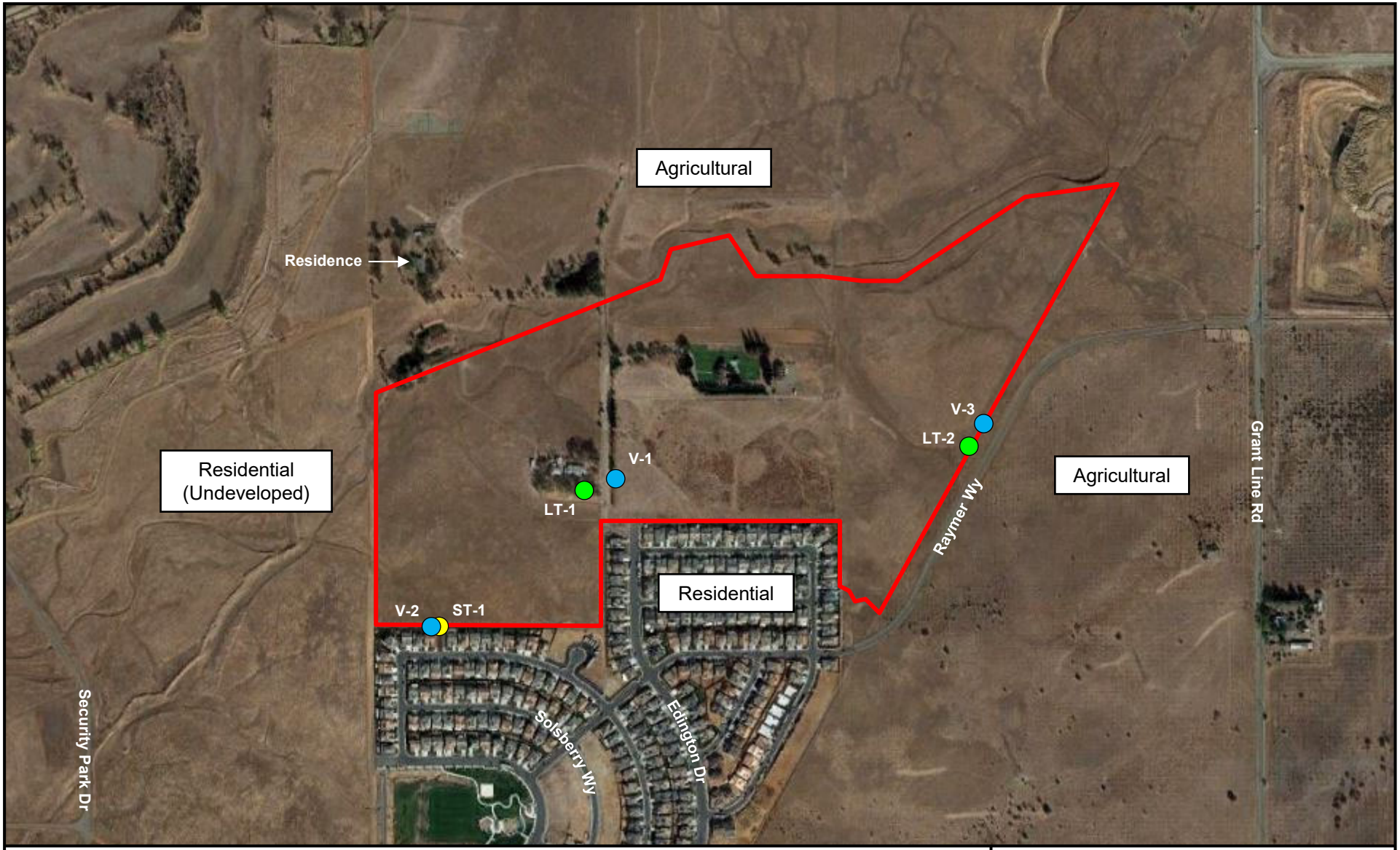
Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that noise is generally considered to be pressure waves transmitted through air, while vibration is usually associated with transmission through the ground or structures. As with noise, vibration consists of an amplitude and frequency. A person's response to vibration will depend on their individual sensitivity as well as the amplitude and frequency of the source.

Vibration can be described in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration in terms of velocity in inches per second peak particle velocity (IPS, PPV) or root-mean-square (VdB, RMS). Standards pertaining to perception as well as damage to structures have been developed for vibration in terms of peak particle velocity as well as RMS velocities.

As vibrations travel outward from the source, they excite the particles of rock and soil through which they pass and cause them to oscillate. Differences in subsurface geologic conditions and distance from the source of vibration will result in different vibration levels characterized by different frequencies and intensities. In all cases, vibration amplitudes will decrease with increasing distance. The maximum rate, or velocity of particle movement, is the commonly accepted descriptor of the vibration "strength".

Human response to vibration is difficult to quantify. Vibration can be felt or heard well below the levels that produce any damage to structures. The duration of the event has an effect on human response, as does frequency. Generally, as the duration and vibration frequency increase, the potential for adverse human response increases.

According to the Transportation and Construction-Induced Vibration Guidance Manual (Caltrans, June 2004), operation of construction equipment and construction techniques generate ground vibration. Traffic traveling on roadways can also be a source of such vibration. At high enough amplitudes, ground vibration has the potential to damage structures and/or cause cosmetic damage. Ground vibration can also be a source of annoyance to individuals who live or work close to vibration-generating activities. However, traffic, rarely generates vibration amplitudes high enough to cause structural or cosmetic damage.



Legend

- Project Boundary (Approximate)
- Long-Term Noise Survey Locations
- Short-Term Noise Survey Location
- Vibration Survey Locations

N

Scale (Feet)

0 400 800

The Preserve Residential Development
Rancho Cordova, California

Project Area

Figure 1

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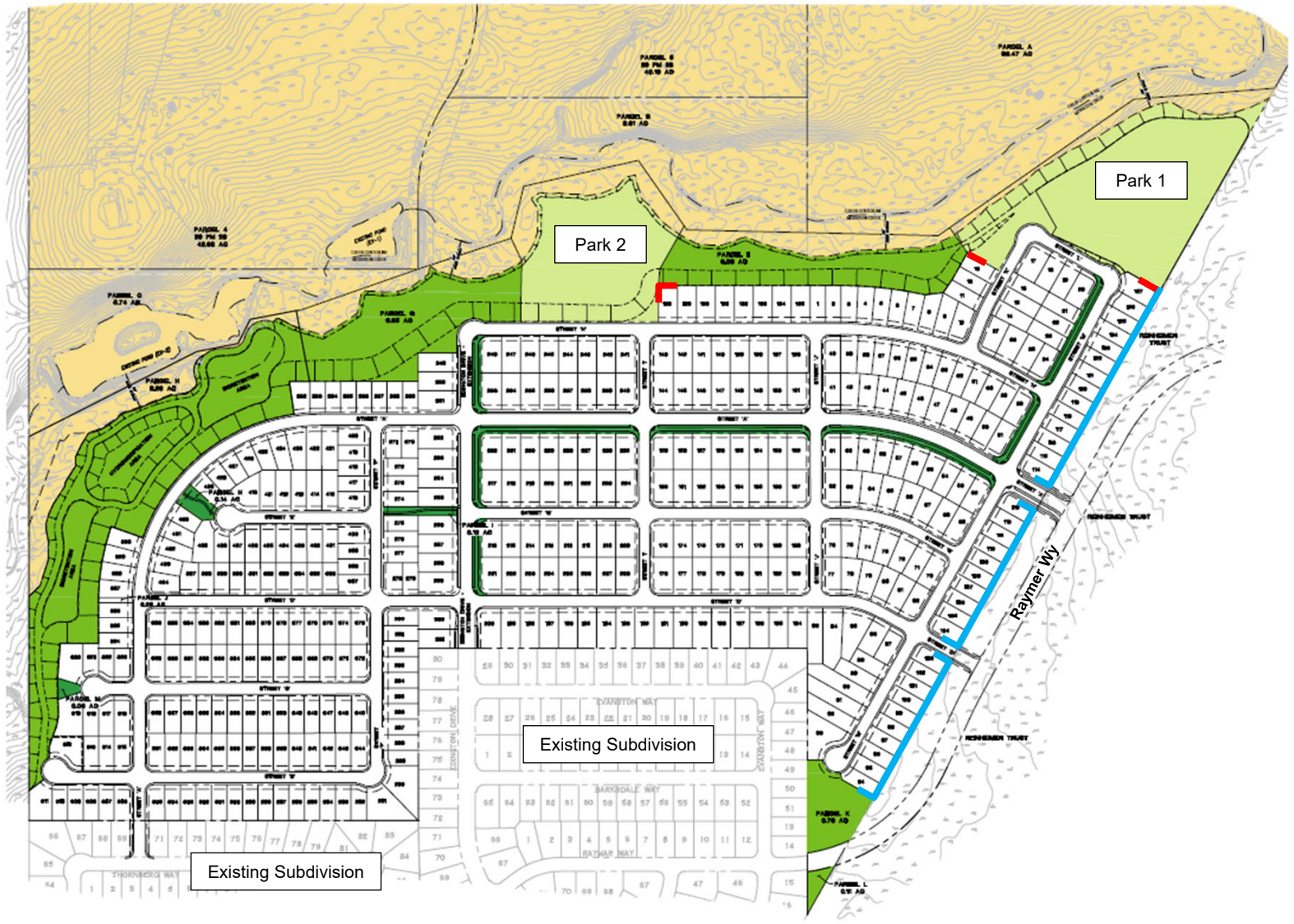

Legend

- Proposed Public Park Areas
- Proposed Open Space Preserve Areas
- Proposed Community Space and Bioretention and Hydromodification Areas
- Recommended 6' Solid Noise Barriers (Mitigation Measure MM 6: Traffic Noise)
- Recommended 6' Solid Noise Barriers (Mitigation Measure MM 8: Park Noise)

N

Scale (Feet)

0 300 600

The Preserve Residential Development
Rancho Cordova, California

Project Site Plan – Parks Exhibit

Figure 2

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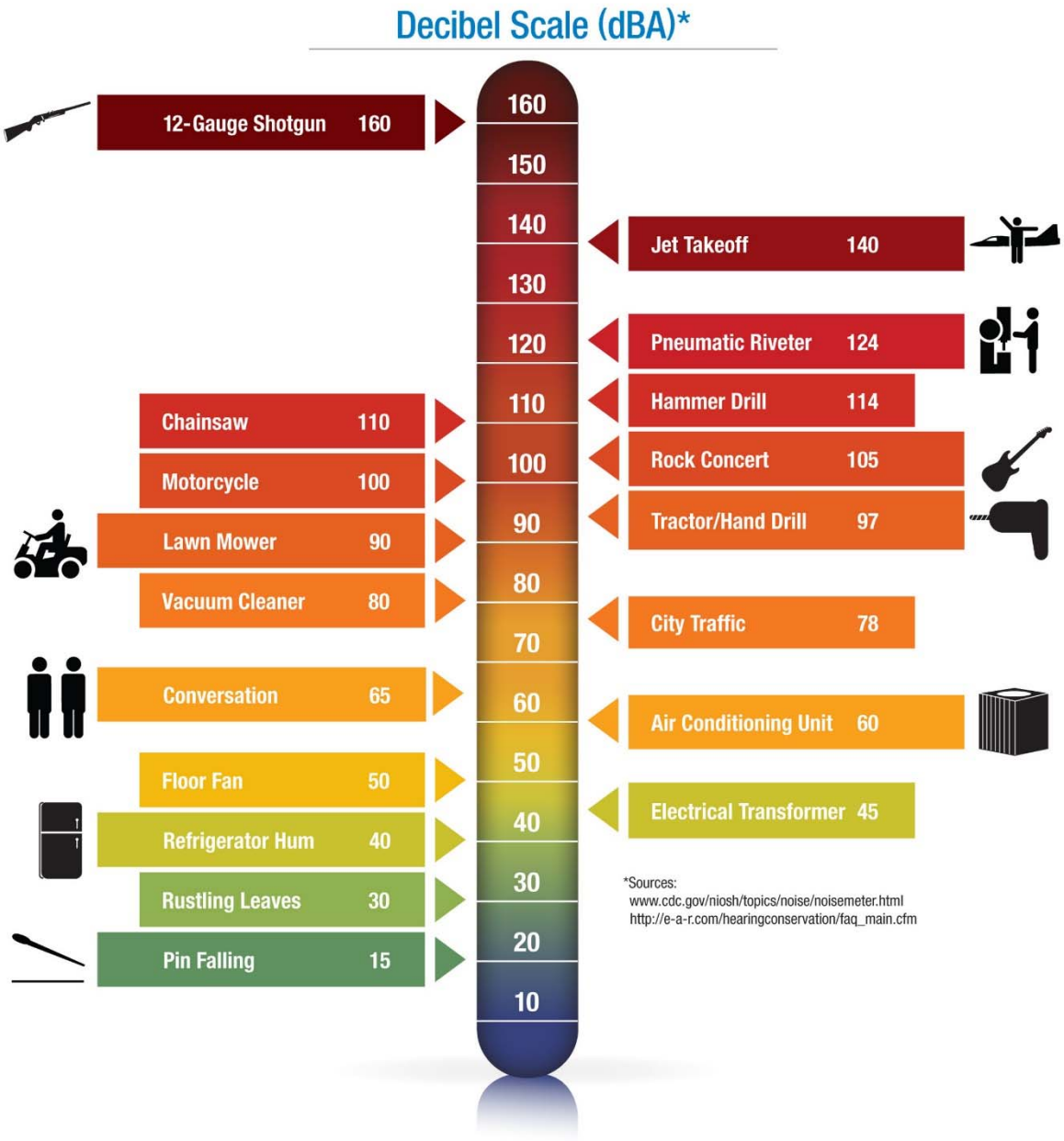
Figure 3
Noise Levels Associated with Common Noise Sources



Environmental Setting – Existing Ambient Noise and Vibration Environment

Existing Noise-Sensitive Land Uses in the Project Vicinity

Noise-sensitive land uses are generally defined as locations where people reside or where the presence of unwanted sound could adversely affect the primary intended use of the land. Places where people live, sleep, recreate, worship, and study are generally considered to be sensitive to noise because intrusive noise can be disruptive to these activities.

The existing noise-sensitive land uses which would potentially be affected by the project consist of residential uses. Specifically, existing single-family residential land uses are located to the south the proposed development (within a subdivision). In addition, existing residences are sparsely located on agriculturally zoned properties north of the project. Although agricultural uses are typically not considered to be noise-sensitive, residences located on agricultural lands would be. The project area and surrounding land uses are shown on Figure 1.

Existing Traffic Noise Levels along Project Area Roadway Network

The FHWA Traffic Noise Model (FHWA-RD-77-108) was used to develop existing noise contours expressed in terms of DNL for major roadways within the project study area. The FHWA Model predicts hourly L_{eq} values for free-flowing traffic conditions. Estimates of the hourly distribution of traffic for a typical 24-hour period were used to develop DNL values from L_{eq} values.

Traffic data in the form of AM and PM peak hour movements for existing conditions were obtained from the client prepared by Kimley-Horn & Associates, Inc. Average daily traffic volumes were conservatively estimated by applying a factor of 5 to the sum of AM and PM peak hour conditions. Using these data and the FHWA Model, traffic noise levels were calculated. The traffic noise level at 100 feet from the roadway centerline and distances from the centerlines of selected roadways to the 60 dB, 65 dB, and 70 dB DNL contours are summarized in Table 1.

In many cases, the actual distances to noise level contours may vary from the distances predicted by the FHWA Model. Factors such as roadway curvature, roadway grade, shielding from local topography or structures, elevated roadways, or elevated receivers may affect actual sound propagation. It is also recognized that existing sensitive land uses within the project vicinity are located varying distances from the centerlines of the local roadway network. The 100-foot reference distance is utilized in this assessment to provide a reference position at which changes in existing and future traffic noise levels resulting from the project can be evaluated. Appendix B contains the FWHA Model inputs for existing conditions.

Table 1
Existing (2019) Traffic Noise Modeling Results

Seg.	Intersection	Direction	DNL 100 Feet from Roadway	Distance to Contour (feet) 70 dB DNL	65 dB DNL	60 dB DNL
1	1-Mather Field Rd / US 50 WB Ramp	North	68	70	150	323
2		South	69	84	180	388
3		East	70	102	220	475
4		West	64	37	81	174
5	2-Mather Field Rd / US 50 EB Ramp	North	69	83	180	387
6		South	70	96	207	446
7		East	65	47	101	217
8		West	70	97	210	452
9	3-Mather Field Rd / International Dr	North				
10		South	60	23	49	106
11		East	67	61	132	284
12		West	68	78	168	362
13	4-Zinfandel Dr / US 50 WB Ramp	North	68	79	170	367
14		South	70	100	215	463
15		East	71	119	256	552
16		West	64	42	91	196
17	5-Zinfandel Dr / US 50 EB Ramp	North	70	101	218	471
18		South	70	104	225	484
19		East	70	93	200	430
20		West	71	117	252	542
21	6-Zinfandel Dr / White Rock Rd	North	70	104	225	484
22		South	68	73	157	339
23		East	65	48	104	223
24		West	65	45	97	209
25	7-Zinfandel Dr / International Dr	North	67	63	135	291
26		South	67	60	128	277
27		East	65	46	99	214
28		West	66	52	112	242
29	8-Sunrise Blvd / Zinfandel Dr	North	71	124	268	577
30		South	72	127	274	590
31		East	53	7	15	32
32		West	60	20	44	95
33	9-Sunrise Blvd / US 50 WB Ramp	North	72	128	275	594
34		South	71	113	244	525
35		East	68	79	170	366
36		West	69	88	189	407
37	10-Sunrise Blvd / US 50 EB Ramp	North	71	113	244	527
38		South	70	103	223	480
39		East	64	42	90	195
40		West	71	114	246	530
41	11-Sunrise Blvd / Folsom Blvd	North	70	103	221	476
42		South	70	95	205	442
43		East	65	48	104	224
44		West	65	47	102	219
45	12-Sunrise Blvd / White Rock Rd	North	69	80	173	372

Table 1
Existing (2019) Traffic Noise Modeling Results

Seg.	Intersection	Direction	DNL 100 Feet from Roadway	Distance to Contour (feet) 70 dB DNL	65 dB DNL	60 dB DNL
46		South	68	79	171	368
47		East	65	50	107	231
48		West	66	52	112	240
49	13-Zinfandel Dr / Douglas Rd	North	65	49	105	227
50		South	59	18	38	83
51		East	65	49	105	225
52		West	64	38	82	177
53	14-Sunrise Blvd / Douglas Rd	North	68	77	165	356
54		South	70	93	200	432
55		East	64	41	88	190
56		West	65	49	105	227
57	15-Americanos Blvd / Douglas Rd	North	53	8	17	36
58		South				
59		East	60	22	46	100
60		West	61	26	56	121
61	16-Sunrise Blvd / Jackson Rd/SR 16	North	69	83	179	385
62		South	68	69	149	321
63		East	66	57	123	265
64		West	65	46	99	212
65	17-Grant Line Rd / Jackson Rd/SR 16	North	65	46	98	212
66		South	64	41	89	191
67		East	67	59	126	272
68		West	66	58	125	269
69	18-Grant Line Rd / Keifer Blvd	North	66	52	113	244
70		South	65	46	99	213
71		East	58	15	32	68
72		West	37	1	1	3
73	19-Grant Line Rd / Douglas Rd	North	66	57	124	267
74		South	66	51	111	238
75		East				
76		West	60	22	47	102
77	20-Grant Line Rd / Raymer Wy	North	68	69	150	322
78		South	67	60	130	281
79		East				
80		West	56	12	26	55
81	21-Grant Line Rd / White Rock Rd	North	68	78	168	363
82		South	67	63	136	294
83		East				
84		West	61	26	57	122
85	22-Prairie City Rd / White Rock Rd	North	66	51	109	235
86		South				
87		East	65	43	94	202
88		West	66	57	122	263

Note: Blank entries are roadway segments for which no traffic data was provided.
Sources: FHWA-RD-77-108 and Kimley Horn & Associates

Existing Overall Ambient Noise Environment within the Project Area

The existing ambient noise environment within the project area is defined primarily by noise from traffic on Grant Line Road and Raymer Way. To generally quantify existing ambient noise levels within the project area, two long-term (48-hour) ambient noise surveys were conducted from July 10-12, 2019 and one short-term (15-minute) ambient noise survey was conducted on July 10, 2019. The ambient noise measurement locations are shown on Figure 1. Photographs of the noise survey locations are provided in Appendix C.

Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meters were used to complete the noise level measurement surveys. The meters were calibrated before use with an LDL Model CA200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all specifications of the American National Standards Institute requirements for Type 1 sound level meters (ANSI S1.4).

The long-term ambient noise survey results are summarized in Table 2. The detailed results of the long-term noise survey are contained in Appendix D in tabular format and graphically in Appendix E. A summary of the short-term noise measurement results is provided in Table 3.

Table 2
Long-Term Noise Level Measurement Results – July 10-12, 2019[1]

				Average Measured Hourly Noise Levels, dB			
				Daytime[3]		Nighttime[4]	
Site[2]	Description	Date	DNL	L_{eq}	L_{max}	L_{eq}	L_{max}
LT-1	Centrally located on project site, near terminus of Edington Drive	7/10-7/11	47	45	62	40	51
		7/11-7/12	47	45	60	39	53
LT-2	Eastern end of project site, approximately 90 feet from centerline of Raymer Way	7/10-7/11	55	50	69	49	65
		7/11-7/12	55	51	72	48	65

[1] Detailed summaries of the noise monitoring results are provided in Appendices D and E.
[2] Ambient noise monitoring locations are identified on Figure 1.
[3] Daytime hours: 7:00 a.m. to 10:00 p.m.
[4] Nighttime hours: 10:00 p.m. to 7:00 a.m.
Source: Bollard Acoustical Consultants, Inc. (2019)

Table 3
Short-Term Noise Level Measurement Results – July 10, 2019

			Measured Noise Levels, dB[3]	
Site[1]	Description	Time of Day	L_{eq}	L_{max}
ST-1	Southwestern end of the project site	12:23 PM	42	58

[1] Ambient noise monitoring location is identified on Figure 1.
Source: Bollard Acoustical Consultants, Inc. (2019)

The Table 2 data indicate that existing ambient noise levels at the project site were satisfactory relative to the Rancho Cordova General Plan normally acceptable and conditionally acceptable exterior traffic noise level standards of 60 and 65 dB DNL for new residential land uses, respectively. Results from the short-term noise survey indicate that the measured average and maximum noise levels at site ST-1 were 42 dB L_{eq} and 58 dB L_{max}, respectively (Table 3).

Existing Ambient Vibration Environment

During a site visit on July 10, 2019, vibration levels were below the threshold of perception at the project site. Nonetheless, to quantify existing vibration levels at the project site, BAC conducted short-term (15-minute) vibration measurements at the project site on July 10, 2019. The vibration measurement sites are shown on Figure 1. Photographs of the vibration measurement sites are shown in Appendix C.

A Larson-Davis Laboratories Model LxT precision integrating sound level meter equipped with a vibration transducer was used to complete the measurements. The results are summarized below in Table 4.

Table 4
Ambient Vibration Monitoring Results – July 10, 2019

Site[2]	Description	Time	Average Measured Vibration Level, PPV (in. sec)[1]
V-1	Eastern end of the project site	11:36 AM	<0.001
V-2	Centrally located on the project site	12:23 PM	<0.001
V-3	Southwestern end of the project site	12:58 PM	<0.001

[1] PPV = Peak Particle Velocity (inches/second)
Source: Bollard Acoustical Consultants, Inc. (2019)

The Table 4 data indicate that measured average vibration levels within the project area were less than 0.001 in/sec PPV.

Regulatory Setting: Criteria for Acceptable Noise and Vibration Exposure

Federal

The City of Rancho Cordova General Plan establishes criteria for assessing noise impacts associated with increases in ambient noise levels from new roadway projects. However, the City does not currently have criteria for assessing noise impacts associated with increases in ambient noise levels from project-generated traffic within the project vicinity. As a result, the following federal noise criteria established by the Federal Interagency Commission on Noise (FICON) was applied to the project.

Federal Interagency Commission on Noise (FICON)

The Federal Interagency Commission on Noise (FICON) has developed a graduated scale for use in the assessment of project-related noise level increases. The criteria shown in Table 5 was developed by FICON as a means of developing thresholds for impact identification for project-related noise level increases. The FICON standards have been used extensively in recent years by the authors of this section in the preparation of the noise sections of Environmental Impact Reports that have been certified in many California cities and counties.

The use of the FICON standards are considered conservative relative to thresholds used by other agencies in the State of California. For example, the California Department of Transportation (Caltrans) requires a project-related traffic noise level increase of 12 dB for a finding of significance, and the California Energy Commission (CEC) considers project-related noise level increases between 5 to 10 dB significant, depending on local factors. Therefore, the use of the FICON standards, which set the threshold for finding of significant noise impacts as low as 1.5 dB, provides a very conservative approach to impact assessment for this project.

Table 5
Significance of Changes in Cumulative Noise Exposure

Ambient Noise Level Without Project (L_{dn} or CNEL)	Change in Ambient Noise Level Due to Project
<60 dB	+5.0 dB or more
60 to 65 dB	+3.0 dB or more
>65 dB	+1.5 dB or more
Source: Federal Interagency Committee on Noise (FICON)	

Based on the FICON research, as shown in Table 5, a 5 dB increase in noise levels due to a project is required for a finding of significant noise impact where ambient noise levels without the project are less than 60 dB. Where pre-project ambient conditions are between 60 and 65 dB, a 3 dB increase is applied as the standard of significance. Finally, in areas already exposed to higher noise levels, specifically pre-project noise levels in excess of 65 dB, a 1.5 dB increase is considered by FICON as the threshold of significance.

State of California

California Environmental Quality Act (CEQA)

The State of California has established regulatory criteria that are applicable to this assessment. Specifically, Appendix G of the State of California Environmental Quality Act (CEQA) Guidelines are used to assess the potential significance of impacts pursuant to local General Plan policies, Municipal Code standards, or the applicable standards of other agencies. According to Appendix G of the CEQA guidelines, the project would result in a significant noise or vibration impact if the following occur:

A. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or other applicable standards of other agencies?

B. Generation of excessive groundborne vibration or groundborne noise levels?

C. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

It should be noted that audibility is not a test of significance according to CEQA. If this were the case, any project which added any audible amount of noise to the environment would be considered significant according to CEQA. Because every physical process creates noise, the use of audibility alone as significance criteria would be unworkable. CEQA requires a substantial increase in noise levels before noise impacts are identified, not simply an audible change.

California Department of Transportation (Caltrans)

The City of Rancho Cordova does not currently have adopted standards for groundborne vibration. As a result, the vibration impact criteria developed by the California Department of Transportation (Caltrans) was applied to the project. The Caltrans criteria applicable to damage and annoyance from transient and continuous vibration typically associated with construction activities are presented in Tables 6 and 7. Equipment or activities typical of continuous vibration include: excavation equipment, static compaction equipment, tracked vehicles, traffic on a highway, vibratory pile drivers, pile-extraction equipment, and vibratory compaction equipment. Equipment or activities typical of single-impact (transient) or low-rate repeated impact vibration include impact pile drivers, blasting, drop balls, "pogo stick" compactors, and crack-and-seat equipment (California Department of Transportation 2013).

Table 6
Guideline Vibration Damage Potential Threshold Criteria

Structure and Condition	Maximum PPV (inches/second)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.20	0.10
Historic and some old buildings	0.50	0.25
Older residential structures	0.50	0.30
New residential structures	1.00	0.50
Modern industrial/commercial buildings	2.00	0.50

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

PPV = Peak Particle Velocity

Source: California Department of Transportation, Transportation and Construction Vibration Guidance Manual (2013).

Table 7
Guideline Vibration Annoyance Potential Criteria

Human Response	Maximum PPV (inches/second)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.40	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.90	0.10
Severe	2.00	0.40

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

PPV = Peak Particle Velocity

Source: California Department of Transportation, Transportation and Construction Vibration Guidance Manual (2013).

Local

Rancho Cordova General Plan

The Noise Element of the Rancho Cordova General Plan contains the County's noise-related goals, policies, and actions. The specific noise-related criteria which are generally applicable to this project are reproduced below:

GOAL N.1 Ensure that all new development will be free of noise disturbances.

Policy N.1.1 Establish standards and policies consistent with those in Tables 7 and 8 (General Plan Tables N-1 and N-2) to govern maximum sound levels in new development.

Action N.1.1.1: Adopt a noise ordinance with noise level performance standards, including maximum allowable noise exposure, ambient versus nuisance noise, method of measuring noise, and enforcement procedures.

Policy N.1.2 Ensure that the indoor and outdoor areas of new projects will be located, constructed, and/or shielded from noise sources in compliance with the City's noise standards to the maximum extent feasible.

Action N.1.2.1: Require new development of noise-creating uses to conform to the City's maximum noise levels.

Action N.1.2.2: Require an acoustical analysis as part of the environmental review process when noise-sensitive land uses are proposed in areas where current or projected exterior noise levels exceed the City's standards.

Action N.1.2.3: Require any potential noise impacts identified during the acoustical analysis to be mitigated in the project design to the maximum extent feasible.

Policy N.1.4 Mitigate noise created by proposed non-transportation noise sources to comply with the City's noise standards to the maximum extent feasible.

Action N.1.4.1: Limit construction activity to the hours of 7:00 AM to 7:00 PM weekdays and 8:00 AM to 6:00 PM weekends when construction is conducted in proximity to residential uses.

Action N.1.4.3: Require stationary construction equipment and construction staging areas to be set back from existing noise-sensitive land uses.

Policy N.1.5 Mitigate noise created by the construction of new transportation noise sources (such as roadways or new light rail service) to the maximum extent feasible to comply with the City's standards.

Policy N.1.7 To the extent feasible and appropriate, the City shall require the use of temporary construction noise control measures for public and private projects that may include the use of temporary noise barriers, temporary relocation of noise-sensitive land uses or other appropriate measures.

Table 8
Noise Level Performance Standards for New Projects
Affected by or Including Non-Transportation Noise Sources[1]

Stationary Noise Source	Noise Level Descriptor	Daytime (7 AM to 10 PM)	Nighttime (10 PM to 7 AM)
Typical	Hourly L_{eq}, dB	55	45
Tonal, impulsive, repetitive, or consist primarily of speech or music	Hourly L_{eq}, dB	50	40

[1] The City may impose noise level standards which are more or less restrictive than those specified above based upon determination of existing low or high ambient noise levels.

Source: Rancho Cordova General Plan, Noise Element, Table N-1

Table 9
Maximum Transportation Noise Exposure

Land Use	Outdoor Activity Areas[2] L_{dn}/CNEL, dB	Interior Spaces L_{dn}/CNEL, dB	Interior Spaces L_{eq}, dB[2]
Residential	60[3]	45	--
Residential subject to noise from railroad tracks, aircraft overflights, or similar noise sources which produce clearly identifiable, discrete noise events (e.g., the passing of a single train)	60[3]	40[5]	--
Transient lodging	60[4]	45	--
Hospitals, nursing homes	60[4]	45	--
Theatres, auditoriums, music halls	--	--	35
Churches, meeting halls	60[3]	--	40
Office buildings	--	--	45
Schools, libraries, museums	--	--	45
Playgrounds, neighborhood parks	70	--	--

[1] Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use. Where it is not practical to mitigate exterior noise levels at patio or balconies of apartment complexes, a common area such as a pool or recreation area may be designated as the outdoor activity area.

[2] As determined for a typical worst-case hour during periods of use.

[3] Where it is not possible to reduce noise in outdoor activity areas to 60 dB Ldn/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB Ldn/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.

[4] In the case of hotel/motel facilities or other transient lodging, outdoor activity areas such as pool areas may not be included in the project design. In these cases, only the interior noise level criterion will apply.

[5] The intent of this noise standard is to provide increased protection against sleep disturbance for residences located near railroad tracks.

Source: Rancho Cordova General Plan Noise Element, Table N-2

Rancho Cordova Municipal Code (Noise Ordinance)

Section 6.68.070 of the Rancho Cordova Noise Ordinance contains criteria that would be applicable to the project. The code sections which are generally applicable to this project are reproduced below.

6.68.070 Exterior noise standards.

A. The following noise standards, unless otherwise specifically indicated in this chapter, shall apply to all properties within a designated noise area:

Table 10

Noise Area	City Zoning Districts	Time Period	Exterior Noise Standard
1	RE-1, RD-1, RE-2, RD-2, RE-3, RD-3, RD-4, R-1-A, RD-5, R-2, RD-10, R-2A, RD-20, R-3, RD-30, RD-40, RM-1, RM-2, A-1-B, AR-1, A-2, AR-2, AR-5	7:00 a.m. – 10:00 p.m.	55 dBA
		10:00 p.m. – 7:00 a.m.	50 dBA
Source: Rancho Cordova Municipal Code, Chapter 6.68, Code Section 6.68.070(A)			

B. It is unlawful for any person at any location within the city to create any noise which causes the noise levels on an affected property, when measured in the designated noise area, to exceed for the duration of time set forth following, the specified exterior noise standards in any one hour by:

Table 11

Cumulative Duration of the Intrusive Sound	Allowable Decibels
1. Cumulative period of 30 minutes per hour	0
2. Cumulative period of 15 minutes per hour	+5
3. Cumulative period of 5 minutes per hour	+10
4. Cumulative period of 1 minute per hour	+15
5. Level no to be exceeded for any time per hour	+20
Source: Rancho Cordova Municipal Code, Chapter 6.68, Code Section 6.68.070(B)	

C. Each of the noise limits specified in subsection (B) of this section shall be reduced by 5 dBA for impulsive or simple tone noises, or for noises consisting of speech or music.

D. If the ambient noise level exceeds that permitted by any of the first four noise-limit categories specified in subsection (B) of this section, the allowable noise limit shall be increased in 5 dBA increments in each category to encompass the ambient noise level. If the ambient noise level exceeds the fifth noise level category, the maximum ambient noise level shall be the noise limit for that category.

6.68.090 Exemptions.

The following activities shall be exempted from the provisions of this chapter:

E. Noise sources associated with construction, repair, remodeling, demolition, paving or grading of any real property, provided said activities do not take place between the hours of 8:00 p.m. and 6:00 a.m. on weekdays and Friday commencing at 8:00 p.m. through and including 7:00 a.m. on Saturday, Saturdays commencing at 8:00 p.m. through and including 7:00 a.m. on the next following Sunday, and on each Sunday after the hour of 8:00 p.m.; provided, however when an unforeseen or unavoidable condition occurs during a construction project and the nature of the project necessitates that work in process be continued until a specific phase is completed, the contractor or owner shall be allowed to

continue work after 8:00 p.m., and to operate machinery and equipment necessary until completion of the specific work in progress can be brought to conclusion under conditions which will not jeopardize inspection acceptance or create undue financial hardships for the contractor or owner.

It should be noted that although not specifically identified in the Rancho Cordova Municipal Code, the Noise Element of the Rancho Cordova General Plan states that activities conducted on public parks are generally considered to be exempt from the noise standards established in the City's Noise Ordinance.

Impacts and Mitigation Measures

Thresholds of Significance

For the purposes of this report, a noise and vibration impact is considered significant if the project would result in:

- Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or other applicable standards of other agencies; or

- Generation of excessive groundborne vibration or groundborne noise levels; or

- 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.

The project site is not within the vicinity of a private airstrip, an airport land use plan, or within two miles of a public airport. Therefore, the last threshold listed above is not discussed further.

The following criteria based on standards established by the Federal Interagency Commission on Noise (FICON), California Department of Transportation (Caltrans), Rancho Cordova General Plan and Rancho Cordova Municipal Code were used to evaluate the significance of environmental noise and vibration resulting from the project:

- A significant noise impact would be identified if the project would expose persons to or generate noise levels that would exceed applicable noise standards presented in the Rancho Cordova General Plan or Rancho Cordova Municipal Code.

- A significant impact would be identified if off-site traffic noise exposure or on-site activities generated by the project would substantially increase noise levels at existing sensitive receptors in the vicinity. A substantial increase would be identified relative to the FICON standards provided in Table 5.

- A significant impact would be identified if project construction activities or proposed on-site operations would expose noise-sensitive receptors to excessive groundborne

vibration levels. Specifically, an impact would be identified if groundborne vibration levels due to these sources would exceed the Caltrans vibration impact criteria.

Noise Impacts Associated with Project-Generated Increases in Off-Site Traffic

With development of the project, traffic volumes on the local roadway network will increase. Those increases in daily traffic volumes will result in a corresponding increase in traffic noise levels at existing uses located along those roadways. The FHWA Model was used with traffic input data from the traffic impact analysis (prepared by Kimley-Horn & Associates, Inc.) to predict project traffic noise level increases relative to Existing (2019) and Cumulative (2035) conditions.

Impact 1: Increases in Existing Traffic Noise Levels due to the Project

Traffic data in the form of AM and PM peak hour movements for Existing and Existing Plus Project conditions in the project area roadway network were obtained from the project transportation impact analysis completed by Kimley-Horn & Associates, Inc. Average daily traffic (ADT) volumes were conservatively estimated by applying a factor of 5 to the sum of AM and PM peak hour conditions.

Existing versus Existing Plus Project traffic noise levels on the local roadway network are shown in Table 12. The following section includes an assessment of predicted traffic noise levels relative to the FICON increase significance noise criteria identified in Table 5. The Table 12 data are provided in terms of DNL (L_{dn}) at a standard distance of 100 feet from the centerlines of the project-area roadways. Appendix B contains the FWHA Model inputs.

Table 12
Traffic Noise Modeling Results and Project-Related Traffic Noise Increases
Existing vs. Existing Plus Project Conditions

			Traffic Noise Level at 100 feet, dB (DNL)			Substantial
Segment	Intersection	Direction	E	E+P	Increase	Increase?
1	1-Mather Field Rd / US 50 WB Ramp	North	67.6	67.6	0.0	No
2		South	68.8	68.8	0.0	No
3		East	70.1	70.1	0.0	No
4		West	63.6	63.6	0.0	No
5	2-Mather Field Rd / US 50 EB Ramp	North	68.8	68.8	0.0	No
6		South	69.7	69.7	0.0	No
7		East	65.0	65.0	0.0	No
8		West	69.8	69.8	0.0	No
9	3-Mather Field Rd / International Dr	North	--	--	--	--
10		South	60.4	63.0	2.6	No
11		East	66.8	66.8	0.0	No
12		West	68.4	69.7	1.3	No
13	4-Zinfandel Dr / US 50 WB Ramp	North	68.5	68.5	0.0	No
14		South	70.0	70.0	0.0	No
15		East	71.1	71.2	0.1	No
16		West	64.4	64.4	0.0	No
17	5-Zinfandel Dr / US 50 EB Ramp	North	70.1	70.1	0.0	No
18		South	70.3	70.3	0.0	No

Table 12
Traffic Noise Modeling Results and Project-Related Traffic Noise Increases
Existing vs. Existing Plus Project Conditions

Segment	Intersection	Direction	Traffic Noise Level at 100 feet, dB (DNL)			Substantial Increase?
			E	E+P	Increase	
19		East	69.5	69.5	0.0	No
20		West	71.0	71.0	0.0	No
21	6-Zinfandel Dr / White Rock Rd	North	70.3	70.3	0.0	No
22		South	67.9	67.9	0.0	No
23		East	65.2	65.4	0.2	No
24		West	64.8	64.8	0.0	No
25	7-Zinfandel Dr / International Dr	North	67.0	67.0	0.0	No
26		South	66.6	66.6	0.0	No
27		East	65.0	65.0	0.0	No
28		West	65.8	65.8	0.0	No
29	8-Sunrise Blvd / Zinfandel Dr	North	71.4	71.5	0.1	No
30		South	71.6	71.6	0.0	No
31		East	52.6	52.6	0.0	No
32		West	59.6	59.6	0.0	No
33	9-Sunrise Blvd / US 50 WB Ramp	North	71.6	71.6	0.0	No
34		South	70.8	70.8	0.0	No
35		East	68.5	68.5	0.0	No
36		West	69.1	69.1	0.0	No
37	10-Sunrise Blvd / US 50 EB Ramp	North	70.8	70.9	0.1	No
38		South	70.2	70.3	0.1	No
39		East	64.3	64.3	0.0	No
40		West	70.9	70.9	0.0	No
41	11-Sunrise Blvd / Folsom Blvd	North	70.2	70.2	0.0	No
42		South	69.7	69.7	0.0	No
43		East	65.2	65.3	0.1	No
44		West	65.1	65.1	0.0	No
45	12-Sunrise Blvd / White Rock Rd	North	68.6	68.6	0.0	No
46		South	68.5	68.5	0.0	No
47		East	65.5	65.8	0.3	No
48		West	65.7	65.9	0.2	No
49	13-Zinfandel Dr / Douglas Rd	North	65.3	65.3	0.0	No
50		South	58.8	58.8	0.0	No
51		East	65.3	65.3	0.0	No
52		West	63.7	63.7	0.0	No
53	14-Sunrise Blvd / Douglas Rd	North	68.3	68.2	-0.1	No
54		South	69.5	69.5	0.0	No
55		East	64.2	64.2	0.0	No
56		West	65.3	65.3	0.0	No
57	15-Americanos Blvd / Douglas Rd	North	53.4	54.2	0.8	No
58		South	--	--	--	--
59		East	60.0	60.0	0.0	No
60		West	61.3	61.5	0.2	No
61	16-Sunrise Blvd / Jackson Rd/SR 16	North	68.8	68.8	0.0	No
62		South	67.6	67.6	0.0	No
63		East	66.4	66.4	0.0	No

Table 12
Traffic Noise Modeling Results and Project-Related Traffic Noise Increases
Existing vs. Existing Plus Project Conditions

Segment	Intersection	Direction	Traffic Noise Level at 100 feet, dB (DNL)			Substantial Increase?
			E	E+P	Increase	
64		West	64.9	64.9	0.0	No
65	17-Grant Line Rd / Jackson Rd/SR 16	North	64.9	65.2	0.3	No
66		South	64.2	64.5	0.3	No
67		East	66.5	66.5	0.0	No
68		West	66.5	66.5	0.0	No
69	18-Grant Line Rd / Keifer Blvd	North	65.8	66.1	0.3	No
70		South	64.9	65.2	0.3	No
71		East	57.5	57.9	0.4	No
72		West	37.5	37.5	0.0	No
73	19-Grant Line Rd / Douglas Rd	North	66.4	66.7	0.3	No
74		South	65.7	66.0	0.3	No
75		East	--	--	--	--
76		West	60.1	60.1	0.0	No
77	20-Grant Line Rd / Raymer Wy	North	67.6	67.8	0.2	No
78		South	66.7	67.0	0.3	No
79		East	--	--	--	--
80		West	56.1	57.7	1.6	No
81	21-Grant Line Rd / White Rock Rd	North	68.4	68.7	0.3	No
82		South	67.0	67.8	0.8	No
83		East	--	--	--	--
84		West	61.3	62.2	0.9	No
85	22-Prairie City Rd / White Rock Rd	North	65.6	66.0	0.4	No
56		South	--	--	--	--
87		East	64.6	64.8	0.2	No
88		West	66.3	66.6	0.3	No

Blank cell = no traffic data was provided

Source: FHWA-RD-77-108 with inputs from Kimley-Horn. Appendix B contains the FHWA Model inputs.

As indicated in Table 12, project-generated traffic would not result in a substantial increase of traffic noise levels on the local roadway network relative to the FICON significance criteria identified in Table 5. As a result, off-site traffic noise impacts related to increases in traffic resulting from the implementation of the project (Existing vs. Existing Plus Project conditions) are identified as being ***less than significant***.

Impact 2: Increases in Cumulative Traffic Noise Levels due to the Project

Traffic data in the form of AM and PM peak hour movements for Cumulative and Cumulative Plus Project conditions in the project area roadway network were obtained from the project transportation impact analysis completed by Kimley-Horn & Associates, Inc. Average daily traffic (ADT) volumes were conservatively estimated by applying a factor of 5 to the sum of AM and PM peak hour conditions.

Cumulative versus Cumulative Plus Project traffic noise levels on the local roadway network are shown in Table 13. The following section includes an assessment of predicted traffic noise levels relative to the FICON increase significance noise criteria identified in Table 5. The Table 13 data are provided in terms of DNL (L_{dn}) at a standard distance of 100 feet from the centerlines of the project-area roadways. Appendix B contains the FWHA Model inputs.

Table 13
Traffic Noise Modeling Results and Project-Related Traffic Noise Increases
Cumulative vs. Cumulative Plus Project Conditions

			Traffic Noise Level at 100 feet, dB (DNL)			
Segment	**Intersection**	**Direction**	**C**	**C+P**	**Increase**	**Substantial Increase?**
1	1-Mather Field Rd / US 50 WB Ramp	North	69.5	69.5	0.0	No
2		South	70.8	70.8	0.0	No
3		East	72.0	72.0	0.0	No
4		West	65.9	65.9	0.0	No
5	2-Mather Field Rd / US 50 EB Ramp	North	70.4	70.4	0.0	No
6		South	71.2	71.2	0.0	No
7		East	66.0	66.0	0.0	No
8		West	70.5	70.5	0.0	No
9	3-Mather Field Rd / International Dr	North	--	--	--	--
10		South	62.0	62.0	0.0	No
11		East	70.6	70.6	0.0	No
12		West	71.4	71.4	0.0	No
13	4-Zinfandel Dr / US 50 WB Ramp	North	69.5	69.5	0.0	No
14		South	71.1	71.1	0.0	No
15		East	72.5	72.5	0.0	No
16		West	64.8	64.8	0.0	No
17	5-Zinfandel Dr / US 50 EB Ramp	North	70.8	70.8	0.0	No
18		South	71.0	71.0	0.0	No
19		East	69.9	69.9	0.0	No
20		West	71.9	72.0	0.1	No
21	6-Zinfandel Dr / White Rock Rd	North	71.4	71.4	0.0	No
22		South	69.3	69.3	0.0	No
23		East	66.7	66.8	0.1	No
24		West	65.8	65.8	0.0	No
25	7-Zinfandel Dr / International Dr	North	69.8	69.8	0.0	No
26		South	70.9	70.9	0.0	No
27		East	69.7	69.7	0.0	No
28		West	70.7	70.7	0.0	No
29	8-Sunrise Blvd / Zinfandel Dr	North	72.3	72.3	0.0	No
30		South	72.4	72.5	0.1	No
31		East	53.2	53.2	0.0	No
32		West	60.1	60.1	0.0	No
33	9-Sunrise Blvd / US 50 WB Ramp	North	72.4	72.4	0.0	No
34		South	71.8	71.7	-0.1	No
35		East	69.5	69.0	-0.5	No
36		West	69.6	69.6	0.0	No
37	10-Sunrise Blvd / US 50 EB Ramp	North	71.7	71.7	0.0	No
38		South	71.3	71.3	0.0	No
39		East	65.2	65.2	0.0	No

Table 13
Traffic Noise Modeling Results and Project-Related Traffic Noise Increases
Cumulative vs. Cumulative Plus Project Conditions

Segment	Intersection	Direction	Traffic Noise Level at 100 feet, dB (DNL)			Substantial Increase?
			C	C+P	Increase	
40		West	71.0	71.0	0.0	No
41	11-Sunrise Blvd / Folsom Blvd	North	70.7	70.7	0.0	No
42		South	70.3	70.3	0.0	No
43		East	66.3	66.3	0.0	No
44		West	66.4	66.4	0.0	No
45	12-Sunrise Blvd / White Rock Rd	North	69.5	69.5	0.0	No
46		South	69.4	69.4	0.0	No
47		East	68.6	68.7	0.1	No
48		West	68.2	68.3	0.1	No
49	13-Zinfandel Dr / Douglas Rd	North	69.6	69.6	0.0	No
50		South	65.6	65.6	0.0	No
51		East	69.3	69.3	0.0	No
52		West	66.7	66.7	0.0	No
53	14-Sunrise Blvd / Douglas Rd	North	70.8	70.8	0.0	No
54		South	71.8	71.8	0.0	No
55		East	68.3	68.3	0.0	No
56		West	69.2	69.2	0.0	No
57	15-Americanos Blvd / Douglas Rd	North	61.5	61.8	0.3	No
58		South	60.2	60.2	0.0	No
59		East	65.2	65.2	0.0	No
60		West	65.8	66.0	0.2	No
61	16-Sunrise Blvd / Jackson Rd/SR 16	North	72.1	72.1	0.0	No
62		South	71.0	71.0	0.0	No
63		East	69.0	69.0	0.0	No
64		West	69.0	69.0	0.0	No
65	17-Grant Line Rd / Jackson Rd/SR 16	North	70.2	70.3	0.1	No
66		South	68.7	68.7	0.0	No
67		East	68.8	68.8	0.0	No
68		West	69.0	69.0	0.0	No
69	18-Grant Line Rd / Keifer Blvd	North	70.1	70.1	0.0	No
70		South	69.7	69.8	0.1	No
71		East	59.1	59.1	0.0	No
72		West	58.2	58.3	0.1	No
73	19-Grant Line Rd / Douglas Rd	North	71.0	71.2	0.2	No
74		South	70.7	70.8	0.1	No
75		East	59.4	59.7	0.3	No
76		West	65.3	65.3	0.0	No
77	20-Grant Line Rd / Raymer Wy	North	72.2	72.4	0.2	No
78		South	71.4	71.6	0.2	No
79		East	60.6	60.6	0.0	No
80		West	61.0	62.3	1.3	No
81	21-Grant Line Rd / White Rock Rd	North	73.4	73.4	0.0	No
82		South	72.2	72.4	0.2	No
83		East	--	--	--	--
84		West	68.1	68.3	0.2	No

Table 13
Traffic Noise Modeling Results and Project-Related Traffic Noise Increases
Cumulative vs. Cumulative Plus Project Conditions

Segment	Intersection	Direction	Traffic Noise Level at 100 feet, dB (DNL)			Substantial Increase?
			C	C+P	Increase	
85	22-Prairie City Rd / White Rock Rd	North	69.7	69.7	0.0	No
56		South	--	--	--	--
87		East	70.2	70.3	0.1	No
88		West	71.3	71.4	0.1	No

Blank cell = no traffic data was provided

Source: FHWA-RD-77-108 with inputs from Kimley-Horn. Appendix B contains the FHWA Model inputs.

The Table 13 data indicate that project-generated traffic would not result in a substantial increase of traffic noise levels on the local roadway network relative to the FICON significance criteria identified in Table 5. As a result, off-site traffic noise impacts related to increases in traffic resulting from the implementation of the project (Cumulative vs. Cumulative Plus Project conditions) are identified as being ***less than significant***.

Noise Impacts Associated with Proposed Uses of the Development

The project proposes the development of approximately 434 single-family lots, public parks, and preserve area. Specifically, the proposed project would preserve approximately 180 acres of open space that would be deeded to a third-party conservation entity, as well as for include the creation of approximately 23 acres of public parks north of the proposed residences. The locations of the proposed park and preserve areas are shown on Figure 2. The primary noise sources associated with proposed uses of the development have been identified as public park activities. An assessment of project-related park activity noise levels at the nearest existing noise-sensitive uses follows. The nearest existing noise-sensitive uses to the development have been identified as a single-family residence located on an agriculturally zoned parcel to the northwest, and single-family residences located within a subdivision to the south (shown on Figure 1).

As noted previously, the Rancho Cordova General Plan Noise Element states that activities conducted on public parks are generally considered to be exempt from the noise standards established in the City's Municipal Code (Noise Ordinance). As a result, the following assessment of project-related public park activity noise level exposure at the nearest existing noise-sensitive uses focuses on compliance with applicable Rancho Cordova General Plan noise level criteria only.

Impact 3: Public Park Noise at Existing Noise-Sensitive Uses

According to the project site plans (Parks Exhibit, dated December 11, 2018), the project proposes two large parks at the north and northeast ends of the development. Figure 2 shows the locations of the proposed parks, identified as Parks 1 and 2. Noise generated by public parks vary depending on whether the parks are intended for passive or active use. Passive use includes picnic and sitting areas whereas active use incudes playing fields and play structures. Although the project site plans illustrate the locations of the proposed public parks, the specific park use

types are unknown at the time of writing this report. To provide a conservative estimate of project park noise exposure at existing noise-sensitive uses, it was assumed for the purposes of this analysis that the proposed public parks would have active uses. According to BAC file data, parks consisting of active uses (playing fields) have noise levels of approximately 50 dB L_{eq} and 70 dB L_{max} at a distance of 100 feet (Appendix F).

Based on the reference noise levels presented above, and assuming standard spherical spreading loss (-6 dB per doubling of distance), park activity noise exposure at the nearest existing noise-sensitive uses (single-family residences) was calculated. The results of those calculations are provided in Table 14.

Because park activities would likely consist of human speech (i.e., shouting and cheering during activities), noise associated with park activities would be subject to the Rancho Cordova General Plan's more restrictive daytime and nighttime hourly average noise level standards of 50 and 40 dB L_{eq} (respectively) shown in Table 8. However, it is reasonable to assume that public park hours would be restricted to daytime hours only (7:00 a.m. to 10:00 p.m.). Therefore, project park noise exposure at the nearest existing noise-sensitive uses was assessed relative to the General Plan daytime hourly average noise level standard of 50 dB L_{eq}.

Table 14
Predicted Public Park Activity Noise Levels at Nearest Existing Noise-Sensitive Uses

Noise-Sensitive Receptor[1]	Nearest Park[2]	Distance (ft)[3]	Predicted Noise Levels, L_{eq} (dB)[4]	General Plan Daytime Noise Standard, L_{eq} (dB)
Residences in Subdivision – South	Park 2	1,000	<20	**50**
Residence on Ag. Property – Northwest	Park 2	1,300	28	

[1] Locations of existing noise-sensitive receptors are shown on Figure 1.
[2] Locations of proposed park areas are shown on Figure 2.
[3] Distances measured from center of nearest park area to receptors.
[4] Predicted park activity noise levels at the nearest residences in the subdivision to the south of the project take into consideration the shielding that would be provided by proposed intervening structures of the development (residences), have been conservatively adjusted by -15 dB to account for this screening.

Source: Bollard Acoustical Consultants, Inc. (2020)

As indicated in Table 14, project park noise level exposure is predicted to satisfy the applicable Rancho Cordova General Plan daytime noise level standard at the nearest existing noise-sensitive uses (single family residential uses to the south and northwest of the project site). Because project park activity noise level exposure is predicted to satisfy the applicable Rancho Cordova General Plan noise level criterion, this impact is identified as being ***less than significant.***

Noise Impacts Associated with Project Construction Activities

Impact 4: Project Construction Noise Levels at Existing Noise-Sensitive Uses

During project construction, heavy equipment would be used for grading excavation, paving, and building construction, which would increase ambient noise levels when in use. Noise levels would vary depending on the type of equipment used, how it is operated, and how well it is maintained.

Noise exposure at any single point outside the project work area would also vary depending upon the proximity of equipment activities to that point. The nearest existing noise-sensitive uses (single-family residential within the subdivision to the south) are located approximately 25 feet from where construction activities would occur within the development.

Table 15 includes the range of maximum noise levels for equipment commonly used in general construction projects at full-power operation at a distance of 50 feet. Not all of these construction activities would be required of this project. The Table 15 data also include predicted maximum equipment noise levels at the nearest existing residential uses located approximately 25 feet away, which assume a standard spherical spreading loss of 6 dB per doubling of distance.

Table 15
Construction Equipment Reference Noise Levels and Predicted Noise Levels at 25 Feet

Equipment Description	Maximum Noise Level at 50 Feet (dBA)	Predicted Maximum Noise Levels at 25 Feet (dBA)
Air compressor	80	86
Backhoe	80	86
Ballast equalizer	82	88
Ballast tamper	83	89
Compactor	82	88
Concrete mixer	85	91
Concrete pump	82	88
Concrete vibrator	76	82
Crane, mobile	83	89
Dozer	85	91
Excavator	85	91
Generator	82	88
Grader	85	91
Impact wrench	85	91
Loader	80	86
Paver	85	91
Pneumatic tool	85	91
Pump	77	83
Saw	76	82
Scarifier	83	89
Scraper	85	91
Shovel	82	88
Spike driver	77	83
Tie cutter	84	90
Tie handler	80	86
Tie inserter	85	91
Truck	84	90

Source: Federal Transit Administration Noise and Vibration Impact Assessment Manual, Table 7-1 (2018)

Based on the equipment noise levels in Table 15, worst-case on-site project construction equipment noise levels at the nearest existing residential uses located 25 feet away are expected to range from approximately 82 to 91 dB. Thus, it is possible that a portion of the project construction equipment could result in substantial short-term increases over ambient maximum noise levels at the nearest existing noise-sensitive uses. Furthermore, it is possible that those

noise levels could exceed the applicable Rancho Cordova General Plan and Municipal Code noise level limits.

As noted in the Regulatory Setting Section of this report, Section 6.68.090 of the Rancho Cordova Municipal Code exempts noise sources associated with construction provided such activities do not take place between specific hours. However, if construction activities are proposed during the hours not exempted by Municipal Code Section 6.68.090, noise levels generated by construction activities would likely exceed the maximum noise level standards identified in Table 15 at the nearest existing residential uses.

Because project construction equipment noise levels could potentially exceed the applicable Rancho Cordova General Plan and Municipal Code noise level standards at the closest existing noise-sensitive uses, noise impacts associated with construction activities are identified as being **potentially significant**.

Mitigation Impact 4:

In order to comply with applicable Rancho Cordova Municipal Code noise level standards, and in order to reduce to potential for an exceedance of applicable Rancho Cordova General Plan noise level criteria, the following measures should be incorporated into project construction operations:

MM 4: To the maximum extent practical, the following measures should be incorporated into the project construction operations:

- Noise-generating construction activities shall occur within the hours and days identified in Section 6.68.090 of the Rancho Cordova Municipal Code and Policy N.1.4 of the Rancho Cordova General Plan.
- Project construction operations shall comply with the construction related noise abatement measures contained Policies N.1.4, N.1.5, and N.1.7 of the Rancho Cordova General Plan.
- All noise-producing project equipment and vehicles using internal-combustion engines shall be equipped with manufacturers-recommended mufflers and be maintained in good working condition.
- All mobile or fixed noise-producing equipment used on the project site that are regulated for noise output by a federal, state, or local agency shall comply with such regulations while in the course of project activity.
- Electrically powered equipment shall be used instead of pneumatic or internal-combustion-powered equipment, where feasible.
- Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practicable from noise-sensitive uses.
- Project area and site access road speed limits shall be established and enforced during the construction period.

- Nearby residences shall be notified of construction schedules so that arrangements can be made, if desired, to limit their exposure to short-term increases in ambient noise levels.

Significance of Impact 4 after Mitigation: *Less than Significant*

Vibration Impacts Associated with Project Activities

Impact 5: Vibration Generated by Project Construction and On-Site Operations

During project construction, heavy equipment would be used for grading, excavation, paving, and building construction, which would generate localized vibration in the immediate vicinity of the construction. The nearest existing sensitive structures (residences) are located approximately 30 feet from construction activities which would occur within the project site.

Table 16 includes the range of vibration levels for equipment commonly used in general construction projects at a distance of 25 feet. The Table 16 data also include predicted equipment vibration levels at the nearest existing residences to the project site located approximately 30 feet away.

Table 16
Vibration Source Levels for Construction Equipment and Predicted Levels at 30 Feet

Equipment	Maximum PPV (inches/second)[1]	
	Maximum PPV at 25 Feet[2]	Predicted PPV at 30 Feet
Large bulldozer	0.089	0.068
Hoe ram	0.089	0.068
Caisson drilling	0.089	0.068
Loaded trucks	0.076	0.058
Backhoe	0.051	0.039
Excavator	0.051	0.039
Grader	0.051	0.039
Loader	0.051	0.039
Jackhammer	0.035	0.027
Small bulldozer	0.003	0.002

[1] PPV = Peak Particle Velocity
[2] Reference vibration level obtained from the Federal Transit Administration (FTA), Transit Noise and Vibration Impact Assessment Manual (2018).

As indicated in Table 16, vibration levels generated from on-site construction activities at the nearest existing residence located approximately 30 feet away are predicted to be well below the strictest Caltrans thresholds for damage to residential structures of 0.30 in/sec PPV shown in Table 6. Further, the predicted vibration levels in Table 16 are well below the threshold for a severe human response as defined by Caltrans in Table 7. Therefore, on-site construction within the project area is not expected to result in excessive groundborne vibration levels at nearby existing residential uses.

Results from the ambient vibration level monitoring at the project site (Table 4) indicate that measured average vibration levels were well below the strictest Caltrans thresholds for damage

to structures and thresholds for annoyance. Therefore, it is expected that the project would not result in the exposure of persons to excessive groundborne vibration levels at proposed uses of the project.

The project proposes residential and park uses within the development. It is the experience of BAC that residential and park uses do not typically have equipment that generates appreciable vibration. Further, it is our understanding that the residential and park components of the project do not propose equipment that will produce appreciable vibration.

Because vibration levels due to and upon the proposed project are expected to satisfy the applicable Caltrans groundborne impact vibration criteria, this impact is considered to be ***less than significant***.

Noise Impacts Upon the Development

The California Supreme Court issued an opinion in *California Building Industry Association v. Bay Area Air Quality Management District (2015)* holding that CEQA is primarily concerned with the impacts of a project on the environment and generally does not require agencies to analyze the impact of existing conditions on a project's future users or residents. Nevertheless, the City of Rancho Cordova has policies that address existing/future conditions affecting the proposed project, which are discussed in the following section.

On-Site Traffic Noise Impacts

Impact 6: Future Exterior Traffic Noise Levels at Proposed Uses

The FHWA Model was used with future traffic data to predict future exterior traffic noise levels at the proposed residential and park uses of the development. The future (Cumulative Plus Project) average daily traffic (ADT) volumes for Grant Line Road and Raymer Way were calculated using data provided in the project traffic impact analysis prepared by Kimley-Horn & Associates, Inc. Specifically, future average daily traffic (ADT) volumes were conservatively estimated by applying a factor of 5 to the sum of AM and PM peak hour conditions. The predicted future Grant Line Road and Raymer Way traffic noise levels at the nearest proposed residential and park uses to the roadways are summarized in Table 17. Detailed FHWA Model inputs and results are provided in Appendix G.

Table 17
Predicted Future Exterior Traffic Noise Levels at Proposed Uses[1]

Roadway[2]	Location	Distance from Centerline (ft)[3]	Future Exterior DNL (dB)[4]
Grant Line Road	Nearest park (Park 1)	1,080	57
	Nearest residential backyards	1,050	57
	Nearest first-floor residential facades	1,060	57
	Nearest upper-floor residential facades	1,060	59
Raymer Way	Nearest park (Park 1)	450	53
	Nearest residential backyards	110	63
	Nearest first-floor residential facades	120	62
	Nearest upper-floor residential facades	120	64
Combined Roadways	Nearest park (Park 1)	--	59
	Nearest residential backyards	--	64
	Nearest first-floor residential facades	--	63
	Nearest upper-floor residential facades	--	65

[1] A complete listing of FHWA Model inputs and results are provided in Appendix G.
[2] Locations of proposed uses are shown on Figure 2.
[3] Distances measured from said locations to the roadway centerline.
[4] A +2 dB offset was applied to upper-floor facades for reduced ground absorption of sound at elevated locations.
Source: Bollard Acoustical Consultants, Inc. (2020)

As indicated in Table 17, predicted future combined Grant Line Road and Raymer Way traffic noise level exposure at the nearest proposed park use of the development (Park 1) would satisfy the applicable Ranch Cordova General Plan exterior noise level standard of 70 dB DNL for playgrounds and neighborhood park uses. However, at the nearest residential backyards, future combined traffic noise level exposure is predicted to exceed the General Plan exterior noise level standard of 60 dB DNL for residential uses. As a result, this impact is identified as being **potentially significant**.

Mitigation Impact 6:

In order to reduce future Grant Line Road and Raymer Way traffic noise level exposure to a state of compliance with the Rancho Cordova General Plan 60 dB DNL exterior noise level standard at the nearest backyards to the roadways, the following noise mitigation measure should be implemented:

MM 6: Solid traffic noise barriers measuring a minimum of 6-feet in height (relative to backyard elevation) should be constructed at the locations illustrated on Figure 2. The traffic noise barriers could take the form of masonry wall, earthen berm, or a combination of the two. Other materials may be acceptable but should be reviewed by an acoustical consultant prior to use.

Table 18 shows the predicted mitigated future combined Grant Line Road and Raymer Way traffic noise levels at the nearest backyards to the roadways. As

shown in Table 18, mitigated future combined traffic noise level exposure is predicted to satisfy the applicable Rancho Cordova General Plan 60 dB DNL exterior noise level standard at the backyards proposed nearest to the roadways.

Table 18
Predicted Future Exterior Traffic Noise Levels – Mitigated[1]

Roadway[2]	Location	Predicted Mitigated Noise Level, DNL (dB)[4]
Combined Roadways	Nearest backyards	58

[1] Predicted mitigated noise levels include consideration of the shielding provided by a 6-foot solid noise barrier at the locations illustrated on Figure 2.

Source: Bollard Acoustical Consultants, Inc. (2020)

Significance of Impact 6 after Mitigation: *Less than Significant*

Impact 7: Future Interior Traffic Noise Levels at Proposed Residential Uses

After implementation of Mitigation Measure 6 (construction of 6-foot-tall traffic noise barriers), future combined exterior traffic noise levels from Grant Line Road and Raymer Way are predicted to be approximately 58 dB DNL at the first-floor facades of the residences constructed nearest to the roadways. Due to reduced ground absorption at elevated positions and lack of shielding by the noise barriers identified in Mitigation Measure 6, future combined traffic noise levels at the upper-floor facades of those residences are predicted to be approximately 65 dB DNL. In order to satisfy the Rancho Cordova General Plan 45 dB DNL interior noise level standard, minimum noise reductions of 13 dB and 20 dB would be required of the first- and upper-floor building facades (respectively) of the residences constructed adjacent to the roadway.

Standard building construction (stucco siding, STC-27 windows, door weather-stripping, exterior wall insulation, composition plywood roof), typically results in an exterior to interior noise reduction of approximately 25 dB with windows closed and approximately 15 dB with windows open. This level of noise reduction would be adequate to reduce future Grant Line Road and Raymer Way traffic noise levels within all residences in this development to 45 dB DNL or less. As a result, no consideration of additional building facade construction improvements would be required for residences of the proposed development provided mechanical ventilation (air conditioning) is included to allow occupants to close doors and windows as desired for additional acoustical isolation. As a result, this impact is considered to be ***less than significant***.

Impact 8: Public Park Noise at Proposed Residential Uses

According to the project site plan illustrated on Figure 2, public parks are proposed to be located adjacent to residential uses at the north end of the development. Public park activities have been identified as a primary noise source that could impact nearby residential uses proposed within the development.

As noted previously, the Rancho Cordova General Plan Noise Element states that activities conducted on public parks are generally considered to be exempt from the noise standards

established in the City's Municipal Code (Noise Ordinance). Because noise associated with parks is not exempted by the Rancho Cordova General Plan, project public park noise level exposure would be subject to General Plan noise criteria. Because park activities would likely consist of human speech (i.e., shouting and cheering during activities), noise associated with park activities would be subject to the General Plan's more restrictive daytime and nighttime hourly average noise level standards of 50 and 40 dB L_{eq} (respectively) shown in Table 8. However, it is reasonable to assume that public park hours would be restricted to daytime hours only (7:00 a.m. to 10:00 p.m.). Based on the above information, project park noise exposure at the nearest proposed uses was assessed relative to the Rancho Cordova General Plan daytime hourly average noise level standard of 50 dB L_{eq}.

An analysis of predicted public park noise exposure at existing noise-sensitive uses (residential uses) was presented in **Impact 3**. BAC file data referenced in that analysis indicate that parks consisting of active uses have noise levels of up to 50 dB L_{eq} and 70 dB L_{max} at a distance of 100 feet. The nearest proposed residential uses to a public park maintain a separation of approximately 70 feet from the center of the park. Based on the reference noise level presented above, and assuming standard spherical spreading loss (-6 dB per doubling of distance), park activity noise exposure at the nearest proposed residential uses located 70 feet away was calculated to be 53 dB L_{eq}. The predicted park activity noise level of 53 dB L_{eq} at the nearest residential uses would exceed the applicable Rancho Cordova General Plan daytime hourly average noise level standard of 50 dB L_{eq}. As a result, this impact is identified as being **potentially significant**.

Mitigation Impact 8:

In order to reduce to reduce the potential for an exceedance of the Rancho Cordova General Plan daytime hourly average noise level standard of 50 dB L_{eq} at adjacent proposed residential uses, the following public park noise mitigation measure should be implemented:

MM 8: Solid noise barriers measuring a minimum of 6-feet in height (relative to backyard elevation) should be constructed at the locations illustrated on Figure 2. The recommended noise barrier extension could take the form of a solid masonry wall or wood fence. Should the construction of a wood fence be selected as a barrier, the fence slats should overlap by a minimum of two inches and be screwed to the framing rather than nailed. The purpose of the overlapping slats and using screws rather than nails is to ensure that prolonged exposure to the elements does not result in visible gaps through the slats which would result in reduced noise barrier effectiveness. The final barrier design should be reviewed by an acoustical consultant prior to installation.

The construction of 6-foot tall noise barriers at the locations illustrated on Figure 2 would reduce predicted park noise level levels to 48 dB L_{eq} or less at the nearest residential uses, and would satisfy the Rancho Cordova General Plan hourly average daytime noise level standard of 50 dB L_{eq}.

Significance of Impact 8 after Mitigation: ***Less than Significant***

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.

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 a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.

Frequency The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz.

IIC Impact Insulation Class (IIC): A single-number representation of a floor/ceiling partition's impact generated noise insulation performance. The field-measured version of this number is the FIIC.

L_{dn} Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.

L_{eq} Equivalent or energy-averaged sound level.

L_{max} The highest root-mean-square (RMS) sound level measured over a given period of time.

Loudness A subjective term for the sensation of the magnitude of sound.

Masking The amount (or the process) by which the threshold of audibility is for one sound is raised by the presence of another (masking) sound.

Noise Unwanted sound.

Peak Noise The level corresponding to the highest (not RMS) sound pressure measured over a given period of time. This term is often confused with the "Maximum" level, which is the highest RMS level.

RT_{60} The time it takes reverberant sound to decay by 60 dB once the source has been removed.

STC Sound Transmission Class (STC): A single-number representation of a partition's noise insulation performance. This number is based on laboratory-measured, 16-band (1/3-octave) transmission loss (TL) data of the subject partition. The field-measured version of this number is the FSTC.

Appendix B-1
FHWA Highway Traffic Noise Prediction Model Data Inputs
The Preserve Residential Development
File Name: 2019-085 01 Existing
Model Run Date: 9/1/2020

Segment	Intersection	Direction	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance
1	(1) Mather Field Rd / US 50 WB Ramp	North	22,840	80	20	2	2	45	100
2		South	30,105	80	20	2	2	45	100
3		East	16,940	80	20	2	2	65	100
4		West	3,745	80	20	2	2	65	100
5	(2) Mather Field Rd / US 50 EB Ramp	North	30,040	80	20	2	2	45	100
6		South	37,100	80	20	2	2	45	100
7		East	5,240	80	20	2	2	65	100
8		West	15,760	80	20	2	2	65	100
9	(3) Mather Field Rd / International Dr	North							
10		South	11,650	80	20	2	2	25	100
11		East	18,810	80	20	2	2	45	100
12		West	27,150	80	20	2	2	45	100
13	(4) Zinfandel Dr / US 50 WB Ramp	North	27,655	80	20	2	2	45	100
14		South	39,220	80	20	2	2	45	100
15		East	21,270	80	20	2	2	65	100
16		West	4,485	80	20	2	2	65	100
17	(5) Zinfandel Dr / US 50 EB Ramp	North	40,205	80	20	2	2	45	100
18		South	41,950	80	20	2	2	45	100
19		East	14,630	80	20	2	2	65	100
20		West	20,675	80	20	2	2	65	100
21	(6) Zinfandel Dr / White Rock Rd	North	42,000	80	20	2	2	45	100
22		South	24,540	80	20	2	2	45	100
23		East	13,140	80	20	2	2	45	100
24		West	11,870	80	20	2	2	45	100
25	(7) Zinfandel Dr / International Dr	North	19,585	80	20	2	2	45	100
26		South	18,130	80	20	2	2	45	100
27		East	12,335	80	20	2	2	45	100
28		West	14,840	80	20	2	2	45	100
29	(8) Sunrise Blvd / Zinfandel Dr	North	54,655	80	20	2	2	45	100
30		South	56,455	80	20	2	2	45	100
31		East	1,960	80	20	2	2	25	100
32		West	7,240	80	20	2	2	30	100
33	(9) Sunrise Blvd / US 50 WB Ramp	North	56,945	80	20	2	2	45	100
34		South	47,435	80	20	2	2	45	100

Appendix B-1
FHWA Highway Traffic Noise Prediction Model Data Inputs
The Preserve Residential Development
File Name: 2019-085 01 Existing
Model Run Date: 9/1/2020

Segment	Intersection	Direction	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance
35		East	11,475	80	20	2	2	65	100
36		West	13,465	80	20	2	2	65	100
37	(10) Sunrise Blvd / US 50 EB Ramp	North	47,610	80	20	2	2	45	100
38		South	41,355	80	20	2	2	45	100
39		East	4,455	80	20	2	2	65	100
40		West	19,990	80	20	2	2	65	100
41	(11) Sunrise Blvd / Folsom Blvd	North	40,875	80	20	2	2	45	100
42		South	36,650	80	20	2	2	45	100
43		East	13,170	80	20	2	2	45	100
44		West	12,775	80	20	2	2	45	100
45	(12) Sunrise Blvd / White Rock Rd	North	28,255	80	20	2	2	45	100
46		South	27,780	80	20	2	2	45	100
47		East	13,845	80	20	2	2	45	100
48		West	14,670	80	20	2	2	45	100
49	(13) Zinfandel Dr / Douglas Rd	North	13,445	80	20	2	2	45	100
50		South	2,960	80	20	2	2	45	100
51		East	13,325	80	20	2	2	45	100
52		West	9,290	80	20	2	2	45	100
53	(14) Sunrise Blvd / Douglas Rd	North	26,425	80	20	2	2	45	100
54		South	27,715	80	20	2	2	50	100
55		East	10,325	80	20	2	2	45	100
56		West	13,475	80	20	2	2	45	100
57	(15) Americanos Blvd / Douglas Rd	North	1,480	80	20	2	2	35	100
58		South							
59		East	3,945	80	20	2	2	45	100
60		West	5,265	80	20	2	2	45	100
61	(16) Sunrise Blvd / Jackson Rd/SR 16	North	18,650	80	20	2	2	55	100
62		South	14,165	80	20	2	2	55	100
63		East	10,655	80	20	2	2	55	100
64		West	7,630	80	20	2	2	55	100
65	(17) Grant Line Rd / Jackson Rd/SR 16	North	7,610	80	20	2	2	55	100
66		South	6,520	80	20	2	2	55	100
67		East	11,090	80	20	2	2	55	100
68		West	10,900	80	20	2	2	55	100

Appendix B-1
FHWA Highway Traffic Noise Prediction Model Data Inputs
The Preserve Residential Development
File Name: 2019-085 01 Existing
Model Run Date: 9/1/2020

Segment	Intersection	Direction	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance
69	(18) Grant Line Rd / Keifer Blvd	North	9,385	80	20	2	2	55	100
70		South	7,645	80	20	2	2	55	100
71		East	2,230	80	20	2	2	45	100
72		West	60	80	20	2	2	25	100
73	(19) Grant Line Rd / Douglas Rd	North	10,755	80	20	2	2	55	100
74		South	9,075	80	20	2	2	55	100
75		East							
76		West	4,050	80	20	2	2	45	100
77	(20) Grant Line Rd / Raymer Wy	North	14,285	80	20	2	2	55	100
78		South	11,605	80	20	2	2	55	100
79		East							
80		West	2,780	80	20	2	2	35	100
81	(21) Grant Line Rd / White Rock Rd	North	17,045	80	20	2	2	55	100
82		South	12,440	80	20	2	2	55	100
83		East							
84		West	5,295	80	20	2	2	45	100
85	(22) Prarie City / White Rock Rd	North	8,900	80	20	2	2	55	100
86		South							
87		East	11,290	80	20	2	2	45	100
88		West	16,790	80	20	2	2	45	100

Note: Blank cells represent roadways for which no traffic data was provided.

Appendix B-2
FHWA Highway Traffic Noise Prediction Model Data Inputs
The Preserve Residential Development
File Name: 2019-085 02 Existing+Project
Model Run Date: 9/1/2020

Segment	Intersection	Direction	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance
1	(1) Mather Field Rd / US 50 WB Ramp	North	22,840	80	20	2	2	45	100
2		South	30,105	80	20	2	2	45	100
3		East	16,940	80	20	2	2	65	100
4		West	3,745	80	20	2	2	65	100
5	(2) Mather Field Rd / US 50 EB Ramp	North	30,040	80	20	2	2	45	100
6		South	37,100	80	20	2	2	45	100
7		East	5,240	80	20	2	2	65	100
8		West	15,760	80	20	2	2	65	100
9	(3) Mather Field Rd / International Dr	North							
10		South	21,600	80	20	2	2	25	100
11		East	18,810	80	20	2	2	45	100
12		West	37,100	80	20	2	2	45	100
13	(4) Zinfandel Dr / US 50 WB Ramp	North	27,765	80	20	2	2	45	100
14		South	39,525	80	20	2	2	45	100
15		East	21,465	80	20	2	2	65	100
16		West	4,485	80	20	2	2	65	100
17	(5) Zinfandel Dr / US 50 EB Ramp	North	40,510	80	20	2	2	45	100
18		South	42,425	80	20	2	2	45	100
19		East	14,630	80	20	2	2	65	100
20		West	20,845	80	20	2	2	65	100
21	(6) Zinfandel Dr / White Rock Rd	North	42,475	80	20	2	2	45	100
22		South	24,540	80	20	2	2	45	100
23		East	13,615	80	20	2	2	45	100
24		West	11,870	80	20	2	2	45	100
25	(7) Zinfandel Dr / International Dr	North	19,585	80	20	2	2	45	100
26		South	18,130	80	20	2	2	45	100
27		East	12,335	80	20	2	2	45	100
28		West	14,840	80	20	2	2	45	100
29	(8) Sunrise Blvd / Zinfandel Dr	North	55,060	80	20	2	2	45	100
30		South	56,860	80	20	2	2	45	100
31		East	1,960	80	20	2	2	25	100
32		West	7,240	80	20	2	2	30	100
33	(9) Sunrise Blvd / US 50 WB Ramp	North	57,350	80	20	2	2	45	100
34		South	47,840	80	20	2	2	45	100

Appendix B-2
FHWA Highway Traffic Noise Prediction Model Data Inputs
The Preserve Residential Development
File Name: 2019-085 02 Existing+Project
Model Run Date: 9/1/2020

Segment	Intersection	Direction	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance
35		East	11,475	80	20	2	2	65	100
36		West	13,465	80	20	2	2	65	100
37	(10) Sunrise Blvd / US 50 EB Ramp	North	48,015	80	20	2	2	45	100
38		South	41,760	80	20	2	2	45	100
39		East	4,455	80	20	2	2	65	100
40		West	19,990	80	20	2	2	65	100
41	(11) Sunrise Blvd / Folsom Blvd	North	40,825	80	20	2	2	45	100
42		South	36,675	80	20	2	2	45	100
43		East	13,245	80	20	2	2	45	100
44		West	12,775	80	20	2	2	45	100
45	(12) Sunrise Blvd / White Rock Rd	North	28,800	80	20	2	2	45	100
46		South	27,780	80	20	2	2	45	100
47		East	15,010	80	20	2	2	45	100
48		West	15,290	80	20	2	2	45	100
49	(13) Zinfandel Dr / Douglas Rd	North	13,445	80	20	2	2	45	100
50		South	2,995	80	20	2	2	45	100
51		East	13,400	80	20	2	2	45	100
52		West	9,330	80	20	2	2	45	100
53	(14) Sunrise Blvd / Douglas Rd	North	26,310	80	20	2	2	45	100
54		South	27,755	80	20	2	2	50	100
55		East	10,475	80	20	2	2	45	100
56		West	13,400	80	20	2	2	45	100
57	(15) Americanos Blvd / Douglas Rd	North	1,770	80	20	2	2	35	100
58		South							
59		East	3,945	80	20	2	2	45	100
60		West	5,555	80	20	2	2	45	100
61	(16) Sunrise Blvd / Jackson Rd/SR 16	North	18,650	80	20	2	2	55	100
62		South	14,275	80	20	2	2	55	100
63		East	10,840	80	20	2	2	55	100
64		West	7,705	80	20	2	2	55	100
65	(17) Grant Line Rd / Jackson Rd/SR 16	North	8,195	80	20	2	2	55	100
66		South	6,920	80	20	2	2	55	100
67		East	11,090	80	20	2	2	55	100
68		West	11,085	80	20	2	2	55	100

Appendix B-2
FHWA Highway Traffic Noise Prediction Model Data Inputs
The Preserve Residential Development
File Name: 2019-085 02 Existing+Project
Model Run Date: 9/1/2020

Segment	Intersection	Direction	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance
69	(18) Grant Line Rd / Keifer Blvd	North	10,145	80	20	2	2	55	100
70		South	8,230	80	20	2	2	55	100
71		East	2,405	80	20	2	2	45	100
72		West	60	80	20	2	2	25	100
73	(19) Grant Line Rd / Douglas Rd	North	11,515	80	20	2	2	55	100
74		South	9,835	80	20	2	2	55	100
75		East							
76		West	4,050	80	20	2	2	45	100
77	(20) Grant Line Rd / Raymer Wy	North	14,700	80	20	2	2	55	100
78		South	12,365	80	20	2	2	55	100
79		East							
80		West	3,955	80	20	2	2	35	100
81	(21) Grant Line Rd / White Rock Rd	North	18,405	80	20	2	2	55	100
82		South	15,035	80	20	2	2	55	100
83		East							
84		West	6,530	80	20	2	2	45	100
85	(22) Prarie City / White Rock Rd	North	9,715	80	20	2	2	55	100
86		South							
87		East	11,835	80	20	2	2	45	100
88		West	18,150	80	20	2	2	45	100

Note: Blank cells represent roadways for which no traffic data was provided.

Appendix B-3
FHWA Highway Traffic Noise Prediction Model Data Inputs
The Preserve Residential Development
File Name: 2019-085 03 Cumulative
Model Run Date: 9/1/2020

Segment	Intersection	Direction	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance
1	(1) Mather Field Rd / US 50 WB Ramp	North	35,050	80	20	2	2	45	100
2		South	47,050	80	20	2	2	45	100
3		East	26,250	80	20	2	2	65	100
4		West	6,350	80	20	2	2	65	100
5	(2) Mather Field Rd / US 50 EB Ramp	North	43,600	80	20	2	2	45	100
6		South	51,750	80	20	2	2	45	100
7		East	6,550	80	20	2	2	65	100
8		West	18,300	80	20	2	2	65	100
9	(3) Mather Field Rd / International Dr	North							
10		South	17,050	80	20	2	2	25	100
11		East	45,350	80	20	2	2	45	100
12		West	54,400	80	20	2	2	45	100
13	(4) Zinfandel Dr / US 50 WB Ramp	North	35,200	80	20	2	2	45	100
14		South	50,950	80	20	2	2	45	100
15		East	28,850	80	20	2	2	65	100
16		West	4,900	80	20	2	2	65	100
17	(5) Zinfandel Dr / US 50 EB Ramp	North	47,200	80	20	2	2	45	100
18		South	49,800	80	20	2	2	45	100
19		East	15,950	80	20	2	2	65	100
20		West	25,650	80	20	2	2	65	100
21	(6) Zinfandel Dr / White Rock Rd	North	53,750	80	20	2	2	45	100
22		South	33,550	80	20	2	2	45	100
23		East	18,500	80	20	2	2	45	100
24		West	14,900	80	20	2	2	45	100
25	(7) Zinfandel Dr / International Dr	North	37,600	80	20	2	2	45	100
26		South	47,950	80	20	2	2	45	100
27		East	36,750	80	20	2	2	45	100
28		West	46,600	80	20	2	2	45	100
29	(8) Sunrise Blvd / Zinfandel Dr	North	67,000	80	20	2	2	45	100
30		South	69,150	80	20	2	2	45	100
31		East	2,250	80	20	2	2	25	100
32		West	8,100	80	20	2	2	30	100
33	(9) Sunrise Blvd / US 50 WB Ramp	North	68,450	80	20	2	2	45	100
34		South	59,000	80	20	2	2	45	100

Appendix B-3
FHWA Highway Traffic Noise Prediction Model Data Inputs
The Preserve Residential Development
File Name: 2019-085 03 Cumulative
Model Run Date: 9/1/2020

Segment	Intersection	Direction	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance
35		East	14,500	80	20	2	2	65	100
36		West	14,950	80	20	2	2	65	100
37	(10) Sunrise Blvd / US 50 EB Ramp	North	58,600	80	20	2	2	45	100
38		South	52,700	80	20	2	2	45	100
39		East	5,400	80	20	2	2	65	100
40		West	20,600	80	20	2	2	65	100
41	(11) Sunrise Blvd / Folsom Blvd	North	46,450	80	20	2	2	45	100
42		South	42,500	80	20	2	2	45	100
43		East	16,900	80	20	2	2	45	100
44		West	17,050	80	20	2	2	45	100
45	(12) Sunrise Blvd / White Rock Rd	North	35,150	80	20	2	2	45	100
46		South	34,550	80	20	2	2	45	100
47		East	28,500	80	20	2	2	45	100
48		West	26,000	80	20	2	2	45	100
49	(13) Zinfandel Dr / Douglas Rd	North	36,200	80	20	2	2	45	100
50		South	14,200	80	20	2	2	45	100
51		East	33,450	80	20	2	2	45	100
52		West	18,550	80	20	2	2	45	100
53	(14) Sunrise Blvd / Douglas Rd	North	47,200	80	20	2	2	45	100
54		South	46,650	80	20	2	2	50	100
55		East	26,600	80	20	2	2	45	100
56		West	32,750	80	20	2	2	45	100
57	(15) Americanos Blvd / Douglas Rd	North	9,600	80	20	2	2	35	100
58		South	7,050	80	20	2	2	35	100
59		East	12,900	80	20	2	2	45	100
60		West	15,050	80	20	2	2	45	100
61	(16) Sunrise Blvd / Jackson Rd/SR 16	North	39,600	80	20	2	2	55	100
62		South	31,000	80	20	2	2	55	100
63		East	19,600	80	20	2	2	55	100
64		West	19,500	80	20	2	2	55	100
65	(17) Grant Line Rd / Jackson Rd/SR 16	North	25,950	80	20	2	2	55	100
66		South	18,300	80	20	2	2	55	100
67		East	18,700	80	20	2	2	55	100
68		West	19,450	80	20	2	2	55	100

Appendix B-3
FHWA Highway Traffic Noise Prediction Model Data Inputs
The Preserve Residential Development
File Name: 2019-085 03 Cumulative
Model Run Date: 9/1/2020

Segment	Intersection	Direction	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance
69	(18) Grant Line Rd / Keifer Blvd	North	25,100	80	20	2	2	55	100
70		South	23,250	80	20	2	2	55	100
71		East	3,200	80	20	2	2	45	100
72		West	7,150	80	20	2	2	25	100
73	(19) Grant Line Rd / Douglas Rd	North	31,250	80	20	2	2	55	100
74		South	28,850	80	20	2	2	55	100
75		East	5,900	80	20	2	2	35	100
76		West	13,400	80	20	2	2	45	100
77	(20) Grant Line Rd / Raymer Wy	North	40,650	80	20	2	2	55	100
78		South	34,350	80	20	2	2	55	100
79		East	7,750	80	20	2	2	35	100
80		West	8,450	80	20	2	2	35	100
81	(21) Grant Line Rd / White Rock Rd	North	53,500	80	20	2	2	55	100
82		South	41,050	80	20	2	2	55	100
83		East							
84		West	25,550	80	20	2	2	45	100
85	(22) Prarie City / White Rock Rd	North	22,900	80	20	2	2	55	100
86		South							
87		East	41,400	80	20	2	2	45	100
88		West	53,100	80	20	2	2	45	100

Note: Blank cells represent roadways for which no traffic data was provided.

Appendix B-4
FHWA Highway Traffic Noise Prediction Model Data Inputs
The Preserve Residential Development
File Name: 2019-085 04 Cumulative+Project
Model Run Date: 9/1/2020

Segment	Intersection	Direction	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance
1	(1) Mather Field Rd / US 50 WB Ramp	North	35,050	80	20	2	2	45	100
2		South	47,050	80	20	2	2	45	100
3		East	26,250	80	20	2	2	65	100
4		West	6,350	80	20	2	2	65	100
5	(2) Mather Field Rd / US 50 EB Ramp	North	43,600	80	20	2	2	45	100
6		South	51,750	80	20	2	2	45	100
7		East	6,550	80	20	2	2	65	100
8		West	18,300	80	20	2	2	65	100
9	(3) Mather Field Rd / International Dr	North							
10		South	17,050	80	20	2	2	25	100
11		East	45,350	80	20	2	2	45	100
12		West	54,400	80	20	2	2	45	100
13	(4) Zinfandel Dr / US 50 WB Ramp	North	35,240	80	20	2	2	45	100
14		South	51,145	80	20	2	2	45	100
15		East	29,005	80	20	2	2	65	100
16		West	4,900	80	20	2	2	65	100
17	(5) Zinfandel Dr / US 50 EB Ramp	North	47,395	80	20	2	2	45	100
18		South	50,130	80	20	2	2	45	100
19		East	15,950	80	20	2	2	65	100
20		West	25,785	80	20	2	2	65	100
21	(6) Zinfandel Dr / White Rock Rd	North	54,080	80	20	2	2	45	100
22		South	33,550	80	20	2	2	45	100
23		East	18,830	80	20	2	2	45	100
24		West	14,900	80	20	2	2	45	100
25	(7) Zinfandel Dr / International Dr	North	37,600	80	20	2	2	45	100
26		South	47,950	80	20	2	2	45	100
27		East	36,750	80	20	2	2	45	100
28		West	46,600	80	20	2	2	45	100
29	(8) Sunrise Blvd / Zinfandel Dr	North	67,140	80	20	2	2	45	100
30		South	69,290	80	20	2	2	45	100
31		East	2,250	80	20	2	2	25	100
32		West	8,100	80	20	2	2	30	100
33	(9) Sunrise Blvd / US 50 WB Ramp	North	68,590	80	20	2	2	45	100
34		South	57,640	80	20	2	2	45	100

Appendix B-4
FHWA Highway Traffic Noise Prediction Model Data Inputs
The Preserve Residential Development
File Name: 2019-085 04 Cumulative+Project
Model Run Date: 9/1/2020

Segment	Intersection	Direction	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance
35		East	13,000	80	20	2	2	65	100
36		West	14,950	80	20	2	2	65	100
37	(10) Sunrise Blvd / US 50 EB Ramp	North	58,840	80	20	2	2	45	100
38		South	52,840	80	20	2	2	45	100
39		East	5,400	80	20	2	2	65	100
40		West	20,700	80	20	2	2	65	100
41	(11) Sunrise Blvd / Folsom Blvd	North	46,590	80	20	2	2	45	100
42		South	42,640	80	20	2	2	45	100
43		East	16,900	80	20	2	2	45	100
44		West	17,050	80	20	2	2	45	100
45	(12) Sunrise Blvd / White Rock Rd	North	35,290	80	20	2	2	45	100
46		South	34,550	80	20	2	2	45	100
47		East	29,005	80	20	2	2	45	100
48		West	26,365	80	20	2	2	45	100
49	(13) Zinfandel Dr / Douglas Rd	North	36,200	80	20	2	2	45	100
50		South	14,235	80	20	2	2	45	100
51		East	33,525	80	20	2	2	45	100
52		West	18,590	80	20	2	2	45	100
53	(14) Sunrise Blvd / Douglas Rd	North	47,200	80	20	2	2	45	100
54		South	46,650	80	20	2	2	50	100
55		East	26,745	80	20	2	2	45	100
56		West	32,895	80	20	2	2	45	100
57	(15) Americanos Blvd / Douglas Rd	North	10,220	80	20	2	2	35	100
58		South	7,050	80	20	2	2	35	100
59		East	12,900	80	20	2	2	45	100
60		West	15,670	80	20	2	2	45	100
61	(16) Sunrise Blvd / Jackson Rd/SR 16	North	39,600	80	20	2	2	55	100
62		South	31,075	80	20	2	2	55	100
63		East	19,745	80	20	2	2	55	100
64		West	19,570	80	20	2	2	55	100
65	(17) Grant Line Rd / Jackson Rd/SR 16	North	26,280	80	20	2	2	55	100
66		South	18,445	80	20	2	2	55	100
67		East	18,740	80	20	2	2	55	100
68		West	19,595	80	20	2	2	55	100

Appendix B-4
FHWA Highway Traffic Noise Prediction Model Data Inputs
The Preserve Residential Development
File Name: 2019-085 04 Cumulative+Project
Model Run Date: 9/1/2020

Segment	Intersection	Direction	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance
69	(18) Grant Line Rd / Keifer Blvd	North	25,505	80	20	2	2	55	100
70		South	23,580	80	20	2	2	55	100
71		East	3,200	80	20	2	2	45	100
72		West	7,225	80	20	2	2	25	100
73	(19) Grant Line Rd / Douglas Rd	North	32,195	80	20	2	2	55	100
74		South	29,395	80	20	2	2	55	100
75		East	6,300	80	20	2	2	35	100
76		West	13,400	80	20	2	2	45	100
77	(20) Grant Line Rd / Raymer Wy	North	42,730	80	20	2	2	55	100
78		South	35,295	80	20	2	2	55	100
79		East	7,750	80	20	2	2	35	100
80		West	11,475	80	20	2	2	35	100
81	(21) Grant Line Rd / White Rock Rd	North	54,340	80	20	2	2	55	100
82		South	43,130	80	20	2	2	55	100
83		East							
84		West	26,790	80	20	2	2	45	100
85	(22) Prarie City / White Rock Rd	North	23,225	80	20	2	2	55	100
86		South							
87		East	41,915	80	20	2	2	45	100
88		West	53,940	80	20	2	2	45	100

Note: Blank cells represent roadways for which no traffic data was provided.

Legend

A: LT-1: Centrally located on project site, looking south towards existing residential development (38°34'25.26" N, 121°11'55.21" W)
B: LT-1: Centrally located on project site, looking north towards existing residence (38°34'25.26" N, 121°11'55.21" W)
C: LT-2: Eastern end of project area, looking east towards Raymer Way (38°34'27.30" N, 121°11'31.97" W)
D: LT-2: Eastern end of project area, looking south along Raymer Way (38°34'27.30" N, 121°11'31.97" W)

The Preserve Residential Development
Rancho Cordova, California

Photographs of Survey Locations

Appendix C-1

BOLLARD Acoustical Consultants

Legend

A: V-1: Looking east towards center of project area (38°34'26.00" N, 121°11'53.99" W)
B: ST-1 & V-2: Off Thornberg Way, looking north towards project site (38°34'18.77" N, 121°12'04.71" W)
C: V-3: Eastern end of project area, looking south along Raymer Way (38°34'28.08" N, 121°11'31.07" W)
D: V-3: Eastern end of project area, looking west towards center of project area (38°34'28.08" N, 121°11'31.07" W)

The Preserve Residential Development
Rancho Cordova, California

Photographs of Survey Locations

Appendix C-2

BOLLARD Acoustical Consultants

Appendix D-1
Ambient Noise Monitoring Results - Site LT-1
The Preserve Residential Development - Rancho Cordova, California
July 10-11, 2019

Hour	Leq	Lmax	L50	L90
12:00 PM	49	75	39	36
1:00 PM	41	56	38	35
2:00 PM	44	68	38	35
3:00 PM	50	74	38	34
4:00 PM	41	55	38	35
5:00 PM	42	55	41	35
6:00 PM	43	57	40	36
7:00 PM	47	61	45	41
8:00 PM	46	65	42	37
9:00 PM	38	56	37	35
10:00 PM	38	56	36	34
11:00 PM	37	58	36	34
12:00 AM	34	40	33	31
1:00 AM	33	42	32	31
2:00 AM	31	38	31	30
3:00 AM	35	50	34	32
4:00 AM	39	57	37	33
5:00 AM	43	56	42	38
6:00 AM	46	64	44	41
7:00 AM	43	59	42	40
8:00 AM	45	67	40	38
9:00 AM	48	70	40	37
10:00 AM	41	60	38	35
11:00 AM	41	57	37	34

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	50	38	45	46	31	40
Lmax (Maximum)	75	55	62	64	38	51
L50 (Median)	45	37	40	44	31	36
L90 (Background)	41	34	36	41	30	34

Computed DNL, dB	47
% Daytime Energy	85%
% Nighttime Energy	15%

GPS Coordinates	38°34'25.26"N
	121°11'55.21"W

Notes	Monitoring site centrally located, near terminus of Edington Drive.

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Appendix D-2
Ambient Noise Monitoring Results - Site LT-1
The Preserve Residential Development - Rancho Cordova, California
July 11-12, 2019

Hour	Leq	Lmax	L50	L90
12:00 PM	41	57	38	34
1:00 PM	41	59	37	34
2:00 PM	41	56	38	34
3:00 PM	42	55	38	34
4:00 PM	44	55	41	36
5:00 PM	44	59	42	35
6:00 PM	47	61	46	42
7:00 PM	47	60	45	42
8:00 PM	45	67	41	36
9:00 PM	39	54	38	36
10:00 PM	40	55	39	38
11:00 PM	37	57	36	34
12:00 AM	36	52	34	32
1:00 AM	34	50	33	31
2:00 AM	34	56	32	30
3:00 AM	35	46	34	32
4:00 AM	36	57	33	31
5:00 AM	43	52	41	36
6:00 AM	43	53	42	40
7:00 AM	43	58	43	41
8:00 AM	43	59	41	39
9:00 AM	52	81	38	36
10:00 AM	43	69	38	36
11:00 AM	41	57	37	34

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	52	39	45	43	34	39
Lmax (Maximum)	81	54	60	57	46	53
L50 (Median)	46	37	40	42	32	36
L90 (Background)	42	34	37	40	30	34

Computed DNL, dB	47
% Daytime Energy	86%
% Nighttime Energy	14%

GPS Coordinates	38°34'25.26"N
	121°11'55.21"W

Notes	Monitoring site centrally located, near terminus of Edington Drive.

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Appendix D-3
Ambient Noise Monitoring Results - Site LT-2
The Preserve Residential Development - Rancho Cordova, California
July 10-11, 2019

Hour	Leq	Lmax	L50	L90
1:00 PM	50	75	37	33
2:00 PM	49	75	38	34
3:00 PM	50	71	40	35
4:00 PM	49	69	40	36
5:00 PM	51	69	41	36
6:00 PM	50	71	39	33
7:00 PM	51	73	40	36
8:00 PM	50	68	41	36
9:00 PM	49	63	46	44
10:00 PM	50	69	46	44
11:00 PM	46	62	44	42
12:00 AM	44	60	43	41
1:00 AM	43	60	42	40
2:00 AM	43	63	40	39
3:00 AM	42	59	41	39
4:00 AM	47	63	44	40
5:00 AM	50	64	49	45
6:00 AM	55	80	52	48
7:00 AM	52	69	46	42
8:00 AM	50	68	43	39
9:00 AM	49	68	41	38
10:00 AM	47	65	39	36
11:00 AM	48	68	39	35
12:00 PM	49	70	39	34

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	52	47	50	55	42	49
Lmax (Maximum)	75	63	69	80	59	65
L50 (Median)	46	37	41	52	40	44
L90 (Background)	44	33	37	48	39	42

Computed DNL, dB	55
% Daytime Energy	68%
% Nighttime Energy	32%

GPS Coordinates	38°34'27.30"N
	121°11'31.97"W

Notes	Monitoring site located on the eastern end of the project area, approximately 90 feet from centerline of Raymer Way.

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Appendix D-4
Ambient Noise Monitoring Results - Site LT-2
The Preserve Residential Development - Rancho Cordova, California
July 11-12, 2019

Hour	Leq	Lmax	L50	L90
1:00 PM	50	77	39	34
2:00 PM	47	66	38	33
3:00 PM	48	74	39	35
4:00 PM	49	66	41	35
5:00 PM	49	66	40	34
6:00 PM	50	73	43	36
7:00 PM	52	74	47	39
8:00 PM	50	73	42	37
9:00 PM	50	67	46	44
10:00 PM	49	65	46	44
11:00 PM	48	64	46	45
12:00 AM	46	62	44	41
1:00 AM	51	80	43	41
2:00 AM	43	62	42	39
3:00 AM	43	53	42	40
4:00 AM	43	62	41	38
5:00 AM	48	64	45	42
6:00 AM	51	76	46	43
7:00 AM	53	73	43	42
8:00 AM	51	72	42	40
9:00 AM	57	83	41	38
10:00 AM	51	71	39	37
11:00 AM	50	73	38	35
12:00 PM	50	73	39	35

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	57	47	51	51	43	48
Lmax (Maximum)	83	66	72	80	53	65
L50 (Median)	47	38	41	46	41	44
L90 (Background)	44	33	37	45	38	42

Computed DNL, dB	55
% Daytime Energy	78%
% Nighttime Energy	22%

GPS Coordinates	38°34'27.30"N
	121°11'31.97"W

Notes	Monitoring site located on the eastern end of the project area, approximately 90 feet from centerline of Raymer Way.

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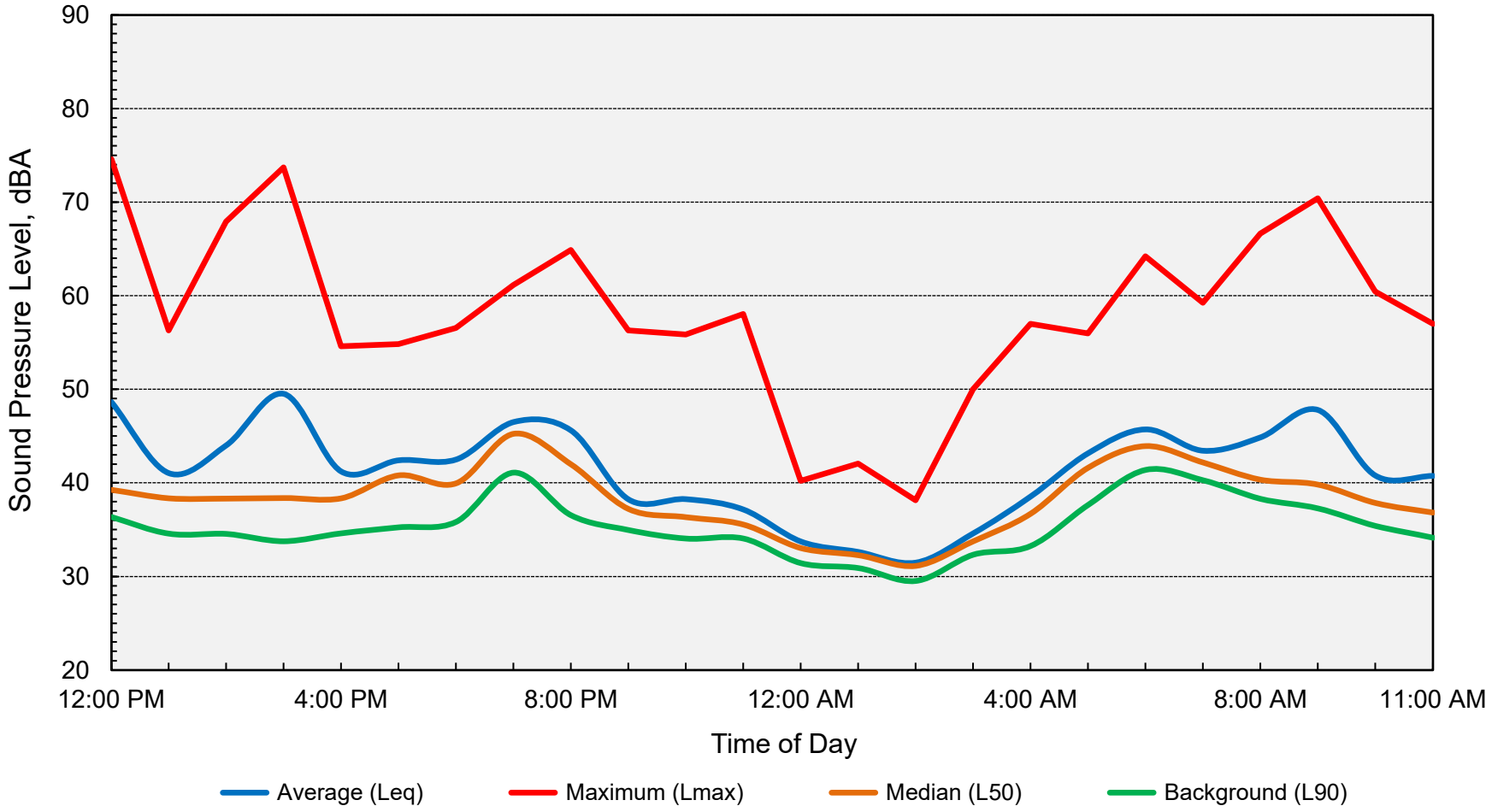
Appendix E-1
Ambient Noise Monitoring Results - Site LT-1
The Preserve Residential Development - Rancho Cordova, California
July 10-11, 2019



Computed DNL = 47 dB

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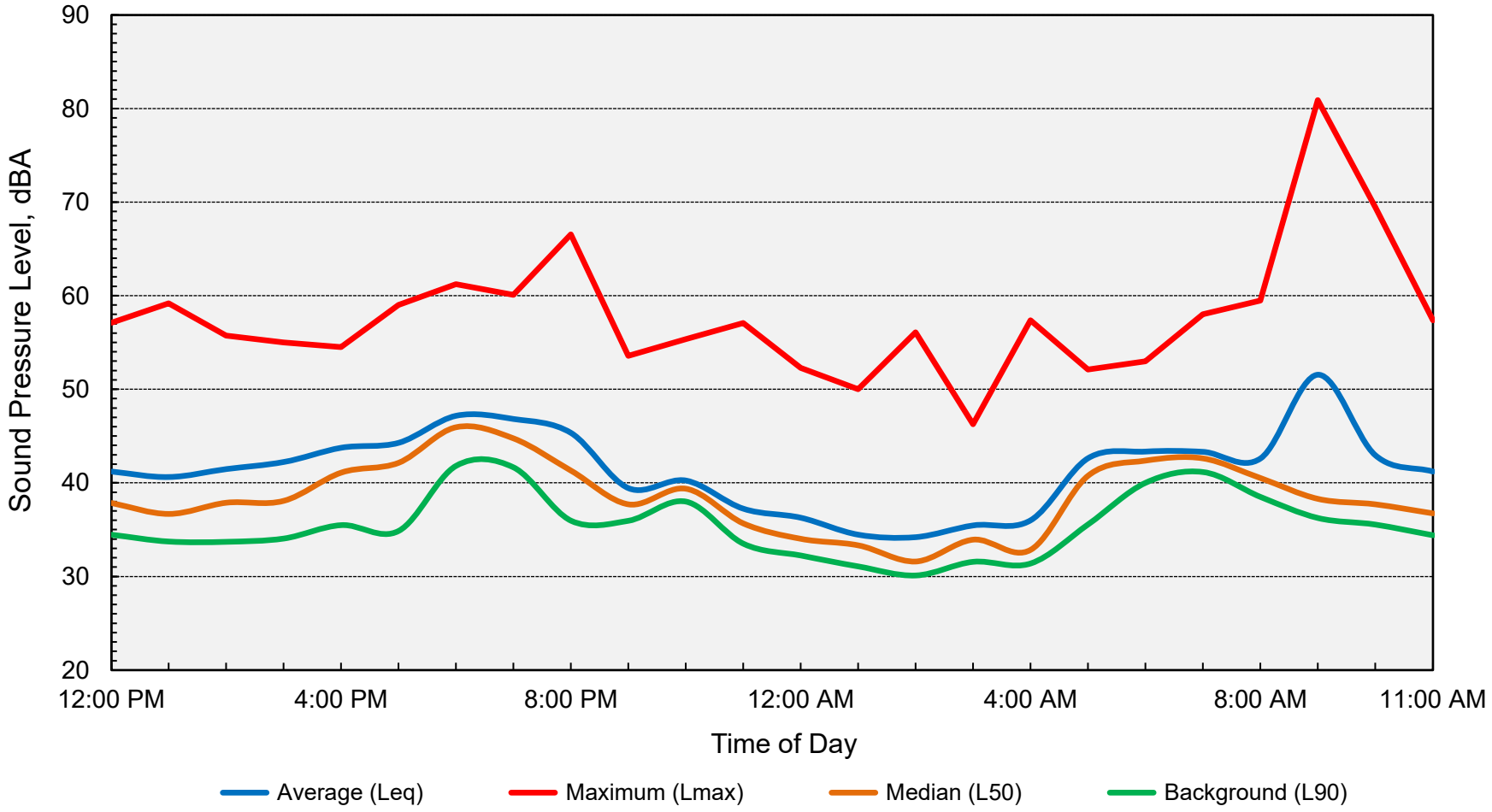
Appendix E-2
Ambient Noise Monitoring Results - Site LT-1
The Preserve Residential Development - Rancho Cordova, California
July 11-12, 2019



Computed DNL = 47 dB

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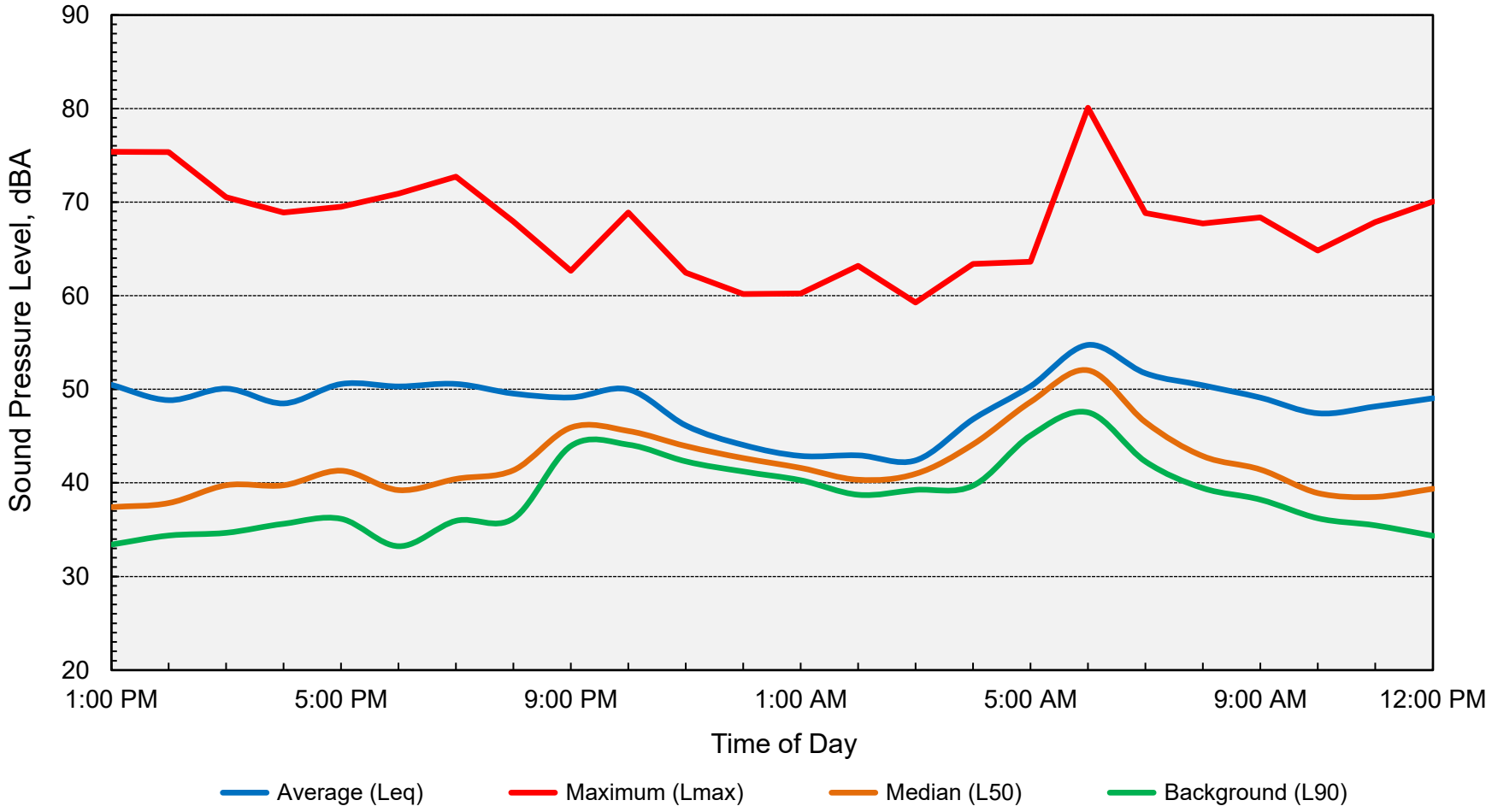
Appendix E-3
Ambient Noise Monitoring Results - Site LT-2
The Preserve Residential Development - Rancho Cordova, California
July 10-11, 2019



Computed DNL = 55 dB

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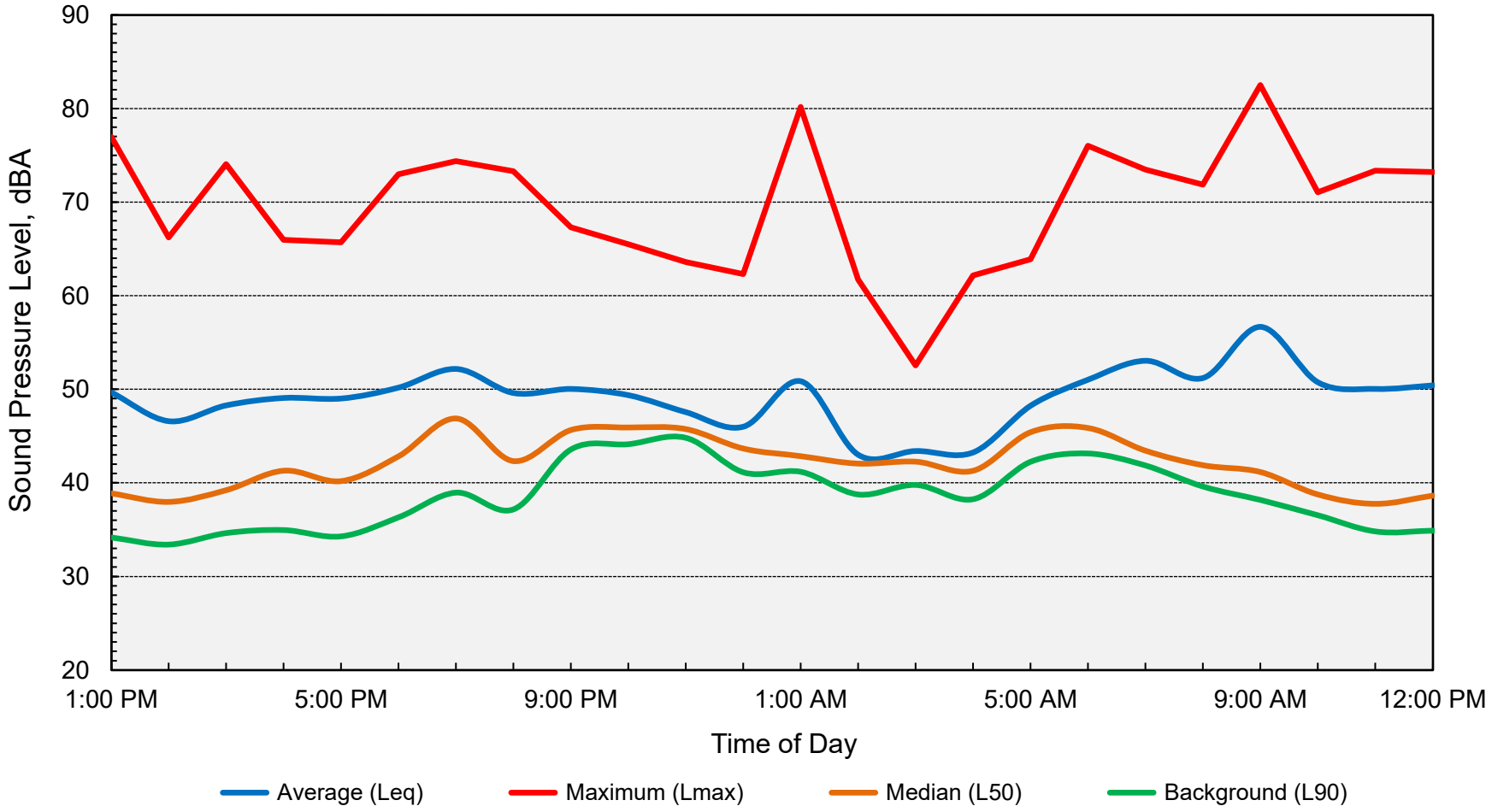
Appendix E-4
Ambient Noise Monitoring Results - Site LT-2
The Preserve Residential Development - Rancho Cordova, California
July 11-12, 2019



Computed DNL = 55 dB

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Appendix F
BAC File Data
Park Playing Fields

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Test Date: 4/6/2016
Location: Rasmussen Community Park - Cameron Park, CA

			Measured Noise Levels, dB	
File #	Time	Duration	Leq	Lmax
1	5:40 PM	1 minute	45	55
2	5:41 PM	1 minute	48	53
3	5:42 PM	1 minute	47	58
4	5:43 PM	1 minute	54	66
5	5:44 PM	1 minute	50	59
6	5:45 PM	1 minute	52	57
7	5:46 PM	1 minute	53	70
8	5:47 PM	1 minute	50	58
9	5:48 PM	1 minute	47	54
10	5:49 PM	1 minute	49	59
11	5:50 PM	1 minute	53	62
12	5:51 PM	1 minute	46	52
13	5:52 PM	1 minute	50	61
14	5:53 PM	1 minute	51	63
15	5:54 PM	1 minute	51	64
16	5:55 PM	1 minute	51	63
17	5:56 PM	1 minute	52	67
18	5:57 PM	1 minute	53	66
19	5:58 PM	1 minute	50	59
20	5:59 PM	1 minute	49	59
21	6:00 PM	1 minute	51	59
22	6:01 PM	1 minute	52	62
23	6:02 PM	1 minute	52	59
24	6:03 PM	1 minute	51	58
25	6:04 PM	1 minute	50	58
26	6:05 PM	1 minute	50	60
27	6:06 PM	1 minute	52	65
28	6:07 PM	1 minute	45	51
29	6:08 PM	1 minute	53	61
30	6:09 PM	1 minute	52	61
31	6:10 PM	1 minute	50	58
32	6:11 PM	1 minute	53	64
33	6:12 PM	1 minute	49	54
34	6:13 PM	1 minute	53	69
35	6:14 PM	1 minute	52	66
36	6:15 PM	1 minute	47	58
37	6:16 PM	1 minute	47	53
38	6:17 PM	1 minute	52	64
39	6:18 PM	1 minute	51	59
40	6:19 PM	1 minute	52	58
41	6:20 PM	1 minute	53	62
			50	70
			Average	Max

Notes:
Measurements taken at a distance of 100 feet from a well attended little league baseball game

Appendix G-1
FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Noise Prediction Worksheet

Project Information:

Job Number: 2019-085
Project Name: The Preserve Residential Development
Roadway Name: Grant Line Road

Traffic Data:

Year: Future
Average Daily Traffic Volume: 35,295
Percent Daytime Traffic: 73
Percent Nighttime Traffic: 27
Percent Medium Trucks (2 axle): 2
Percent Heavy Trucks (3+ axle): 2
Assumed Vehicle Speed (mph): 55
Intervening Ground Type (hard/soft): **Soft**

Traffic Noise Levels:

				DNL, dB			
Location	Description	Distance	Offset (dB)	Autos	Medium Trucks	Heavy Trucks	Total
Park	Nearest Park (Park 1)	1,080	0	56	46	50	57
Residential	Nearest Backyards	1,050	0	56	46	50	57
Residential	Nearest First-Floor Facades	1,060	0	56	46	50	57
Residential	Nearest Upper-Floor Facades	1,060	2	58	48	52	59

Traffic Noise Contours (No Calibration Offset):

DNL Contour, dB	Distance from Centerline, (ft)
75	67
70	145
65	313
60	675

Notes:
1. Future (Cumulative Plus Project conditions) average daily traffic volume for Grant Line Road was obtained using data provided in the traffic impact study conducted for the project by Kimley-Horn & Associates, Inc.
2. Offset of +2 dB offset was applied at upper-level building facades to account for reduced ground absorption of sound at elevated positions.

Appendix G-2
FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Noise Prediction Worksheet

Project Information:

Job Number: 2019-085
Project Name: The Preserve Residential Development
Roadway Name: Raymer Way

Traffic Data:

Year: Future
Average Daily Traffic Volume: 11,475
Percent Daytime Traffic: 73
Percent Nighttime Traffic: 27
Percent Medium Trucks (2 axle): 2
Percent Heavy Trucks (3+ axle): 2
Assumed Vehicle Speed (mph): 35
Intervening Ground Type (hard/soft): **Soft**

Traffic Noise Levels:

				DNL, dB			
Location	Description	Distance	Offset (dB)	Autos	Medium Trucks	Heavy Trucks	Total
Park	Nearest Park (Park 1)	450	0	51	44	49	53
Residential	Nearest Backyards	110	0	60	53	58	63
Residential	Nearest First-Floor Facades	120	0	59	52	57	62
Residential	Nearest Upper-Floor Facades	120	2	61	54	59	64

Traffic Noise Contours (No Calibration Offset):

DNL Contour, dB	Distance from Centerline, (ft)
75	16
70	35
65	76
60	163

Notes: 1. Future (Cumulative Plus Project conditions) average daily traffic volume for Raymer Way was obtained using data provided in the traffic impact study conducted for the project by Kimley-Horn & Associates, Inc.
2. Offset of +2 dB offset was applied at upper-level building facades to account for reduced ground absorption of sound at elevated positions.

January 5, 2021

Rod Stinson
Raney Planning & Management, Inc.
1501 Sports Drive Suite A
Sacramento, CA 95834

Transmitted via email: rods@raneymanagement.com

Subject: Changes in noise levels associated with the addition of six (6) units for the proposed Preserve Residential Development in Rancho Cordova, California.

Dear Rod,

Bollard Acoustical Consultants, Inc. (BAC) previously prepared a noise and vibration assessment for the Preserve Residential Development project in Rancho Cordova, California (dated September 3, 2020). On January 4, 2021, it was brought to the attention of BAC that the project had been revised to include six (6) additional units. According to the revised traffic impact analysis prepared by the project traffic consultant (Kimley-Horn & Associates, Inc.) dated November 4, 2020, the project proposes a total of approximately 434 single-family residential units. After a review of the revised traffic impact analysis, specifically the revised peak-hour turning movements contained in that report, it was determined that the changes in noise levels associated with the additional units would not be appreciable and would not change the conclusions presented in the noise and vibration assessment previously prepared by BAC. As a result, a revision to the noise and vibration study prepared by BAC dated September 3, 2020 would not be warranted.

Please contact me at (916) 663-0500 or dariog@bacnoise.com if you have any questions or require additional information.

Sincerely,

Dario Gotchet

Dario Gotchet
Senior Consultant