



February 19, 2020

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Subject: Traffic noise review for the Aggie Research Campus (ARC) project– City of Davis, California

Dear Mr. Pappani:

Saxelby Acoustics has prepared the following analysis of traffic noise impacts associated with the above-referenced project. The intent of this analysis is to determine whether the proposed project's traffic noise increases would result in impacts greater than that assumed under the Mace Ranch Innovation Center Project DEIR. The following outlines the criteria used to evaluate traffic noise increase from the DEIR and a revaluation of the Aggie Research Campus traffic noise levels versus those criteria.

CRITERIA

Off-site traffic noise increase threshold test

The test of significance for increases in off-site traffic noise is two-fold. First, traffic noise levels are reviewed to see if the project's contribution to traffic noise would exceed the FICON levels identified in Table 4.11-9 of the DEIR [Table 1]. If the project's increase in traffic noise levels along surrounding roadways would exceed the FICON criteria shown in Table 1, the proposed project would be considered to have a significant noise impact along that roadway segment.

TABLE 1: SIGNIFICANCE OF CHANGES IN NOISE EXPOSURE

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

FICON provides guidance in the assessment of changes in ambient noise levels resulting from aircraft operations. The recommendations are based upon studies that relate aircraft noise levels to the percentage of persons highly annoyed by the noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, it has been widely accepted that they are applicable to all sources of noise described in terms of cumulative noise exposure metrics such as the Ldn.

SOURCE: FEDERAL INTERAGENCY COMMITTEE ON NOISE (FICON)

The second part of the significance test would be applied if the project does not result in the traffic noise level increases shown in **Table 1** (i.e., the project does not exceed the FICON criteria). In this case, each roadway segment is assessed to determine whether the project’s traffic noise contribution would cause any receptors along the roadway to be exposed to exterior noise levels exceeding the City’s General Plan Noise Element standards. Specifically, Noise Element Policy 1.1-c requires the following:

New development and changes in use shall generally be allowed only if they will not adversely impact attainment within the community of the exterior and interior noise standards shown in Table 19 [Table 4.11-7 of DEIR] and Table 20 [Table 4.11-8 of DEIR]. Cumulative and project specific impacts by new development on existing residential land uses shall be mitigated consistent with the standards in Table 19 [Table 4.11-7 of DEIR] and Table 20 [Table 4.11-8 of DEIR].

For residential uses, Table 19 [Table 4.11-7 of DEIR] establishes a Normally Acceptable exterior noise level standard of 60 dB L_{dn}. Therefore, if an existing residential receptor is exposed to existing noise levels of less than 60 dB L_{dn}, any project-related traffic noise level increase that causes noise levels to exceed 60 dB L_{dn} would be considered significant. If an existing receptor is exposed to conditionally acceptable exterior noise levels (60 to 70 dB) the FICON criteria shown in **Table 1** would be used as the test of significance.

FUTURE TRAFFIC NOISE ENVIRONMENT AT OFF-SITE RECEPTORS

Off-Site Traffic Noise Impact Assessment Methodology

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

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

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

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

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each project-area roadway segment. In some locations sensitive receptors may not receive full shielding from noise barriers, or may be located at distances which vary from the assumed calculation distance. **Table 2** shows the results of this analysis for Existing and Existing Plus Project conditions. **Table 3** shows the results for Cumulative and Cumulative Plus Project conditions. **Appendix A** shows the complete inputs and results of the traffic noise analysis.

TABLE 2: EXISTING AND EXISTING PLUS ARC PROJECT TRAFFIC NOISE LEVELS

Roadway	Segment	Noise Levels (L_{dn} , dB) at Outdoor Activity Areas of Nearest Sensitive Receptors				
		Existing	Existing + Project	Change	Significance Criteria ¹	Significant? (Y/N)
Alhambra	South of Covell	51.9	52.0	0.1	+5 dB or > 60 dB	No
Alhambra	West of Mace	54.0	55.5	1.5	+5 dB or > 60 dB	No
Covell Blvd.	L to Pole Line	63.2	63.9	0.7	+3 dB	No
Covell Blvd.	Pole Line to Birch	62.8	64.1	1.3	+3 dB	No
Covell Blvd.	Birch to Baywood	62.4	63.7	1.3	+3 dB	No
Covell Blvd.	Baywood to Manzanita	62.6	63.9	1.3	+3 dB	No
Covell Blvd.	Manzanita to Wright	60.1	61.5	1.4	+3 dB	No
Covell Blvd.	Wright to Monarch	60.4	61.8	1.4	+3 dB	No
Covell Blvd.	Monarch to Alhambra	61.8	63.2	1.4	+3 dB	No
Covell Blvd.	Alhambra to Harper JR HS	61.0	62.6	1.6	+3 dB	No
Cowell Blvd	Drummond to Mace	58.9	59.1	0.2	+5 dB or > 60 dB	No
Cowell Blvd	East of Mace	56.9	57.0	0.1	+5 dB or > 60 dB	No
Mace Blvd.	Harper JR HS to Alhambra	51.0	52.4	1.4	+5 dB or > 60 dB	No
Mace Blvd.	Alhambra to 2nd	63.0	64.4	1.4	+3 dB	No
Mace Blvd.	Chiles to Cowell	53.9	54.2	0.3	+5 dB or > 60 dB	No
Mace Blvd.	Cowell to El Macero	61.3	61.5	0.2	+3 dB	No
Mace Blvd.	South of El Macero	60.2	60.4	0.1	+3 dB	No
Pole Line Road	North of Covell	66.3	66.7	0.4	+1.5 dB	No
Pole Line Road	Covell to Claremont	60.9	61.0	0.0	+3 dB	No

¹ Where existing noise levels are less than 60 dB an increase of 5 dB would be a significant increase. Additionally, any increase causing noise levels to exceed the City's Normally Acceptable 60 dB L_{dn} noise level standard at an existing residential use would also be significant. Where existing noise levels exceed 60 dB but are less than 65 dB, an increase of 3 dB or more would be significant. Where existing noise levels exceed 65 dB, an increase of 1.5 dB or more would be significant.

² Traffic noise levels do not account for shielding from existing noise barriers or intervening structures. Traffic noise levels may vary depending on actual setback distances and localized shielding.

TABLE 3: CUMULATIVE AND CUMULATIVE PLUS ARC PROJECT TRAFFIC NOISE LEVELS

Roadway	Segment	Noise Levels (L_{dn} , dB) at Outdoor Activity Areas of Nearest Sensitive Receptors				
		Cumulative	Cumulative + Project	Change	Significance Criteria ¹	Significant? (Y/N)
Alhambra	South of Covell	52.6	52.6	0.0	+5 dB or > 60 dB	No
Alhambra	West of Mace	56.7	57.6	0.9	+5 dB or > 60 dB	No
Covell Blvd.	L to Pole Line	63.6	64.3	0.7	+3 dB	No
Covell Blvd.	Pole Line to Birch	63.3	64.4	1.2	+3 dB	No
Covell Blvd.	Birch to Baywood	62.9	64.1	1.2	+3 dB	No
Covell Blvd.	Baywood to Manzanita	63.1	64.3	1.2	+3 dB	No
Covell Blvd.	Manzanita to Wright	60.6	61.9	1.3	+3 dB	No
Covell Blvd.	Wright to Monarch	61.0	62.2	1.2	+3 dB	No
Covell Blvd.	Monarch to Alhambra	62.2	63.5	1.3	+3 dB	No
Covell Blvd.	Alhambra to Harper JR HS	61.5	63.0	1.5	+3 dB	No
Cowell Blvd	Drummond to Mace	61.5	61.6	0.1	+3 dB	No
Cowell Blvd	East of Mace	57.2	57.2	0.1	+5 dB or > 60 dB	No
Mace Blvd.	Harper JR HS to Alhambra	51.5	52.7	1.3	+5 dB or > 60 dB	No
Mace Blvd.	Alhambra to 2nd	64.2	65.4	1.2	+3 dB	No
Mace Blvd.	Chiles to Cowell	55.1	55.3	0.2	+5 dB or > 60 dB	No
Mace Blvd.	Cowell to El Macero	61.7	61.9	0.2	+3 dB	No
Mace Blvd.	South of El Macero	60.7	60.8	0.1	+3 dB	No
Pole Line Road	North of Covell	67.0	67.3	0.4	+1.5 dB	No
Pole Line Road	Covell to Claremont	61.6	61.6	0.0	+3 dB	No

¹ Where existing noise levels are less than 60 dB an increase of 5 dB would be a significant increase. Additionally, any increase causing noise levels to exceed the City's Normally Acceptable 60 dB L_{dn} noise level standard at an existing residential use would also be significant. Where existing noise levels exceed 60 dB but are less than 65 dB, an increase of 3 dB or more would be significant. Where existing noise levels exceed 65 dB, an increase of 1.5 dB or more would be significant.

² Traffic noise levels do not account for shielding from existing noise barriers or intervening structures. Traffic noise levels may vary depending on actual setback distances and localized shielding.

The project-related increases in transportation noise levels would be less than the FICON criteria outlined in **Table 1** above. As shown in the table, some noise-sensitive receptors located along the project-area roadways are currently exposed to exterior traffic noise levels exceeding the City of Davis 60 dB Ldn exterior noise level standard for residential uses. These receptors would continue to experience elevated exterior noise levels with implementation of the proposed project; however, the proposed project's contribution to traffic noise increases is predicted to be 1.6 dB, or less. For example, sensitive receptors located adjacent to Covell Boulevard from Pole Line Road to Birch Lane currently experience an exterior noise level of approximately 62.8 dB Ldn. This exceeds the City's Normally Acceptable exterior noise level standard of 60 dB Ldn. Under Existing Plus Project conditions, exterior traffic noise levels are predicted to be approximately 64.1 dB Ldn. This would still exceed the City's Normally Acceptable exterior noise level standard of 60 dB Ldn. However, the project's contribution 1.3 dB would not exceed the FICON criteria of 3.0 dB where existing noise levels are between 60 and 65 dB. Therefore, this would be a less than significant impact at this particular location.

With respect to the second part of the test of significance, **Table 2** and **Table 3** demonstrate that the proposed project is not predicted to cause increases in existing traffic noise levels which would trigger a new exceedance of the City of Davis' 60 dB Ldn exterior noise level standard at sensitive receptor locations.

Therefore, traffic-related noise increases attributable to project vehicles would result in less than significant impacts to existing sensitive receptors along nearby roadways. These findings are consistent with the findings of the Mace Ranch Innovation Center DEIR and this impact would remain less than significant.

Mitigation Measure(s)

None required.

FUTURE TRAFFIC NOISE ENVIRONMENT AT ON-SITE RECEPTORS

Exterior Noise Levels

Under the Mace Ranch Innovation Center DEIR, future traffic noise levels on the project site were predicted to range between 60-65 dBA at the various proposed noise-sensitive uses. Since the preparation of the DEIR, no substantial increase in railroad operations or Interstate 80 traffic volumes is known to have occurred. However, predicted cumulative traffic volumes for Mace Boulevard have increased from approximately 26,040 vehicles per day to 29,590. This would result in an increase of on-site traffic noise levels of approximately 0.56 dBA. This would potentially result in on-site noise levels increasing up to 0.56 dBA, or 60.5-65.5 dBA at on-site receptors. This increase would not be perceptible and would result in noise levels which do not exceed the City's 60-70 dBA conditionally acceptable noise standard range for residential uses and 65-75 dBA conditionally acceptable range for transient lodging and office, business commercial, and professional uses. These findings are consistent with the findings of the Mace Ranch Innovation Center DEIR and this impact would remain less than significant.

Interior Noise Levels

Exterior noise levels are predicted to be 60.5-65.5 dB Ldn, or less at each of the proposed MRIC use areas. Typical construction measures provide a 25 dB exterior-to-interior noise level reduction. Therefore, interior noise levels are predicted to be less than 40.5 dB Ldn for all proposed MRIC uses. This would comply with the City's 45 dB Ldn standard for residential type uses (hotel) and 55 dB Ldn standard for office uses. These findings are consistent with the findings of the Mace Ranch Innovation Center DEIR and this impact would remain less than significant.

Sincerely,

Saxelby Acoustics LLC



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

Appendix A: Traffic Noise Calculation Inputs and Results



Appendix A-1

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

Project #: 190904

Description: Aggies Research Campus - Existing Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset			Level, dBA
											60 dBA	65 dBA	70 dBA	
1	Alhambra	3,020	85	0	15	1.0%	1.0%	30	60	-5	37	17	8	51.9
2	Alhambra	4,850	85	0	15	1.0%	1.0%	30	60	-5	51	24	11	54.0
3	Covell Blvd.	19,960	83	0	17	1.0%	1.0%	35	100	0	163	76	35	63.2
4	Covell Blvd.	15,650	83	0	17	1.0%	1.0%	35	90	0	139	64	30	62.8
5	Covell Blvd.	15,510	83	0	17	1.0%	1.0%	35	95	0	138	64	30	62.4
6	Covell Blvd.	14,890	83	0	17	1.0%	1.0%	35	90	0	134	62	29	62.6
7	Covell Blvd.	14,490	83	0	17	1.0%	1.0%	35	60	-5	132	61	28	60.1
8	Covell Blvd.	15,530	83	0	17	1.0%	1.0%	35	60	-5	138	64	30	60.4
9	Covell Blvd.	15,360	83	0	17	1.0%	1.0%	40	60	-5	170	79	37	61.8
10	Covell Blvd.	12,820	83	0	17	1.0%	1.0%	40	60	-5	150	70	32	61.0
11	Cowell Blvd	3,740	85	0	15	1.0%	1.0%	25	40	0	34	16	7	58.9
12	Cowell Blvd	4,370	85	0	15	1.0%	1.0%	25	60	0	37	17	8	56.9
13	Mace Blvd.	12,950	83	0	17	1.0%	1.0%	40	600	0	151	70	33	51.0
14	Mace Blvd.	17,080	83	0	17	1.0%	1.0%	40	115	0	182	85	39	63.0
15	Mace Blvd.	10,090	83	0	17	1.0%	1.0%	40	325	0	128	60	28	53.9
16	Mace Blvd.	6,700	83	0	17	1.0%	1.0%	35	65	0	79	37	17	61.3
17	Mace Blvd.	5,310	83	0	17	1.0%	1.0%	35	65	0	68	31	15	60.2
18	Pole Line Road	14,830	85	0	15	1.0%	1.0%	40	60	0	158	73	34	66.3
19	Pole Line Road	10,990	85	0	15	1.0%	1.0%	25	60	0	69	32	15	60.9

Appendix A-2

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

Project #: 190904

Description: Aggies Research Campus - Existing Plus Project Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset			Level, dBA
											60 dBA	65 dBA	70 dBA	
1	Alhambra	3,060	85	0	15	1.0%	1.0%	30	60	-5	38	18	8	52.0
2	Alhambra	6,850	85	0	15	1.0%	1.0%	30	60	-5	65	30	14	55.5
3	Covell Blvd.	23,630	83	0	17	1.0%	1.0%	35	100	0	183	85	39	63.9
4	Covell Blvd.	20,930	83	0	17	1.0%	1.0%	35	90	0	169	78	36	64.1
5	Covell Blvd.	20,820	83	0	17	1.0%	1.0%	35	95	0	168	78	36	63.7
6	Covell Blvd.	20,280	83	0	17	1.0%	1.0%	35	90	0	165	77	36	63.9
7	Covell Blvd.	19,930	83	0	17	1.0%	1.0%	35	60	-5	163	76	35	61.5
8	Covell Blvd.	21,280	83	0	17	1.0%	1.0%	35	60	-5	170	79	37	61.8
9	Covell Blvd.	21,160	83	0	17	1.0%	1.0%	40	60	-5	210	98	45	63.2
10	Covell Blvd.	18,660	83	0	17	1.0%	1.0%	40	60	-5	193	90	42	62.6
11	Cowell Blvd	3,950	85	0	15	1.0%	1.0%	25	40	0	35	16	8	59.1
12	Cowell Blvd	4,470	85	0	15	1.0%	1.0%	25	60	0	38	18	8	57.0
13	Mace Blvd.	17,770	83	0	17	1.0%	1.0%	40	600	0	187	87	40	52.4
14	Mace Blvd.	23,430	83	0	17	1.0%	1.0%	40	115	0	225	104	48	64.4
15	Mace Blvd.	10,750	83	0	17	1.0%	1.0%	40	325	0	134	62	29	54.2
16	Mace Blvd.	7,050	83	0	17	1.0%	1.0%	35	65	0	82	38	18	61.5
17	Mace Blvd.	5,480	83	0	17	1.0%	1.0%	35	65	0	69	32	15	60.4
18	Pole Line Road	16,390	85	0	15	1.0%	1.0%	40	60	0	169	78	36	66.7
19	Pole Line Road	11,040	85	0	15	1.0%	1.0%	25	60	0	69	32	15	61.0

Appendix A-3

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

Project #: 190904

Description: Aggies Research Campus - Cumulative Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset			Level, dBA
											60 dBA	65 dBA	70 dBA	
1	Alhambra	3,500	85	0	15	1.0%	1.0%	30	60	-5	41	19	9	52.6
2	Alhambra	9,100	85	0	15	1.0%	1.0%	30	60	-5	78	36	17	56.7
3	Covell Blvd.	22,000	83	0	17	1.0%	1.0%	35	100	0	174	81	38	63.6
4	Covell Blvd.	17,400	83	0	17	1.0%	1.0%	35	90	0	149	69	32	63.3
5	Covell Blvd.	17,300	83	0	17	1.0%	1.0%	35	95	0	148	69	32	62.9
6	Covell Blvd.	16,700	83	0	17	1.0%	1.0%	35	90	0	145	67	31	63.1
7	Covell Blvd.	16,200	83	0	17	1.0%	1.0%	35	60	-5	142	66	31	60.6
8	Covell Blvd.	17,500	83	0	17	1.0%	1.0%	35	60	-5	150	69	32	61.0
9	Covell Blvd.	17,100	83	0	17	1.0%	1.0%	40	60	-5	182	85	39	62.2
10	Covell Blvd.	14,400	83	0	17	1.0%	1.0%	40	60	-5	163	75	35	61.5
11	Cowell Blvd	6,800	85	0	15	1.0%	1.0%	25	40	0	50	23	11	61.5
12	Cowell Blvd	4,600	85	0	15	1.0%	1.0%	25	60	0	39	18	8	57.2
13	Mace Blvd.	14,300	83	0	17	1.0%	1.0%	40	600	0	162	75	35	51.5
14	Mace Blvd.	22,400	83	0	17	1.0%	1.0%	40	115	0	218	101	47	64.2
15	Mace Blvd.	13,200	83	0	17	1.0%	1.0%	40	325	0	153	71	33	55.1
16	Mace Blvd.	7,400	83	0	17	1.0%	1.0%	35	65	0	84	39	18	61.7
17	Mace Blvd.	5,900	83	0	17	1.0%	1.0%	35	65	0	72	34	16	60.7
18	Pole Line Road	17,300	85	0	15	1.0%	1.0%	40	60	0	175	81	38	67.0
19	Pole Line Road	12,700	85	0	15	1.0%	1.0%	25	60	0	76	35	16	61.6

Appendix A-4

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

Project #: 190904

Description: Aggies Research Campus - Cumulative Plus Project Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset			Level, dBA
											60 dBA	65 dBA	70 dBA	
1	Alhambra	3,540	85	0	15	1.0%	1.0%	30	60	-5	42	19	9	52.6
2	Alhambra	11,090	85	0	15	1.0%	1.0%	30	60	-5	89	41	19	57.6
3	Covell Blvd.	25,670	83	0	17	1.0%	1.0%	35	100	0	193	90	42	64.3
4	Covell Blvd.	22,680	83	0	17	1.0%	1.0%	35	90	0	178	83	38	64.4
5	Covell Blvd.	22,610	83	0	17	1.0%	1.0%	35	95	0	177	82	38	64.1
6	Covell Blvd.	22,090	83	0	17	1.0%	1.0%	35	90	0	175	81	38	64.3
7	Covell Blvd.	21,640	83	0	17	1.0%	1.0%	35	60	-5	172	80	37	61.9
8	Covell Blvd.	23,250	83	0	17	1.0%	1.0%	35	60	-5	181	84	39	62.2
9	Covell Blvd.	22,900	83	0	17	1.0%	1.0%	40	60	-5	222	103	48	63.5
10	Covell Blvd.	20,240	83	0	17	1.0%	1.0%	40	60	-5	204	95	44	63.0
11	Cowell Blvd	7,010	85	0	15	1.0%	1.0%	25	40	0	51	24	11	61.6
12	Cowell Blvd	4,700	85	0	15	1.0%	1.0%	25	60	0	39	18	8	57.2
13	Mace Blvd.	19,120	83	0	17	1.0%	1.0%	40	600	0	196	91	42	52.7
14	Mace Blvd.	29,590	83	0	17	1.0%	1.0%	40	115	0	263	122	57	65.4
15	Mace Blvd.	13,860	83	0	17	1.0%	1.0%	40	325	0	159	74	34	55.3
16	Mace Blvd.	7,750	83	0	17	1.0%	1.0%	35	65	0	87	40	19	61.9
17	Mace Blvd.	6,070	83	0	17	1.0%	1.0%	35	65	0	74	34	16	60.8
18	Pole Line Road	18,860	85	0	15	1.0%	1.0%	40	60	0	185	86	40	67.3
19	Pole Line Road	12,750	85	0	15	1.0%	1.0%	25	60	0	76	35	16	61.6