j.c. brennan & associates
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November 7, 2007

Mr. Mark Teague
PMC
508 Chestnut Street, Suite A
Mount Shasta, CA 96067

Subject: Highland Park Area Roadway Traffic Noise Analysis

Dear Mark:

Based upon the traffic report which was provided to us by Omni-Means, j.c. brennan & associates, Inc. has conducted an analysis of the expected changes in traffic noise levels associated with the Highland Park project.

Methodology

The analysis conducted by j.c. brennan & associates, Inc. utilizes the Federal Highway Administration (FHWA RD 77-108) traffic noise prediction model. Inputs to the model included peak hour traffic volumes provided by Omni Means for the Realignment Alternative. The peak hour volumes were multiplied by a factor of 10 to represent 24-hour ADT volumes. The Realignment Alternative traffic analysis analyzed a total of 3 intersections. The traffic noise analysis conducted by j.c. brennan & associates, Inc. included the following alternatives:

- Short Term No Project;
- Short Term Plus Project;
- Cumulative No Project; and
- Cumulative Plus Project

Criteria

As a means of determining a potential noise impact is to assess a persons' reaction to changes in noise levels due to a project. Table 1 is commonly used to show expected public reaction to changes in environmental noise levels. This table was developed on the basis of test subjects' reactions to changes in the levels of steady-state pure tones or broadband noise and to changes in levels of a given noise source. It is probably most applicable to noise levels in the range of 50 to 70 dBA, as this is the usual range of voice and interior noise levels.

Table 1
Subjective Reaction to Changes in Noise Levels of Similar Sources

Change in Level, dBA	Subjective Reaction	Factor Change in Acoustical Energy
1	Imperceptible (Except for Tones)	1.3
3	Just Barely Perceptible	2.0
6	Clearly Noticeable	4.0
10	About Twice (or Half) as Loud	10.0

Source: Architectural Acoustics, M. David Egan, 1988.

Based upon Table 1, a increase of more than 3 dB would result in a significant increase in traffic noise levels.

Analysis

Tables 2 and 3 show the results of the traffic noise analysis for the Browning, Hilltop and Mission De Oro roadways.

Table 2
Short Term Traffic Noise Levels With & Without Project

		Noise Levels (Ldn, dB) At 75 Feet From Centerline[1]		
Roadway	Segment	Short Term (dB)	Short Term + Project (dB)	Change (dB)
Browning	W. of Hilltop	53	53	0
Browning	E. of Hilltop	63	63	0
Hilltop	N. of Browning	64	64	0
Hilltop	S. of Browning	64	64	0
Browning	W. of Mission De Oro	63	63	0
Browning	E. of Mission De Oro	63	63	0
Mission De Oro	N. of Browning	54	57	3

[1] Distances to traffic noise contours are measured in feet from the centerlines of the roadways.
Source: j.c. brennan & associates, Inc., 2007

Table 3
Cumulative Traffic Noise Levels With and Without Project

Roadway	Segment	Noise Levels (Ldn, dB) At 75 Feet From Centerline[1]		
		Cumulative (dB)	Cumulative + Project (dB)	Change (dB)
Browning	W. of Hilltop	53	53	0
Browning	E. of Hilltop	64	63	-1
Hilltop	N. of Browning	65	65	0
Hilltop	S. of Browning	65	65	0
Browning	W. of Mission De Oro	64	64	0
Browning	E. of Mission De Oro	63	63	0
Mission De Oro	N. of Browning	56	59	3

[1] Distances to traffic noise contours are measured in feet from the centerlines of the roadways.
Source: j.c. brennan & associates, Inc., 2007

Based upon the analysis, the project would not result in an increase in traffic noise levels in excess of 3 dB Ldn. Therefore, no significant impact is expected.

If you have any questions, please contact me at (530) 823-0960.

Respectfully submitted,

j.c. brennan & associates, Inc.

Jim Brennan
President
Member: Institute of Noise Control Engineering

File: 2007-104 – November 7 letter to Mark Teague

Appendix B-1

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

Data Input Sheet

Project #: 104
Description: Short-term No Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Browning	W. of Hilltop	1,260	85		15	2	1	35	75	
2	Browning	E. of Hilltop	11,970	85		15	2	1	35	75	
3	Hilltop	N. of Browning	17,240	85		15	2	1	35	75	
4	Hilltop	S. of Browning	15,170	85		15	2	1	35	75	
5	Browning	W. of Mission De Oro	12,480	85		15	2	1	35	75	
6	Browning	E. of Mission De Oro	11,330	85		15	2	1	35	75	
7	Mission De Oro	N. of Browning	1,460	85		15	2	1	35	75	
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FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Predicted Levels

Project #: 104
Description: Short-term No Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Browning	W. of Hilltop	51.2	44.0	46.2	53
2	Browning	E. of Hilltop	61.0	53.8	56.0	63
3	Hilltop	N. of Browning	62.6	55.4	57.6	64
4	Hilltop	S. of Browning	62.0	54.9	57.0	64
5	Browning	W. of Mission De Oro	61.2	54.0	56.2	63
6	Browning	E. of Mission De Oro	60.8	53.6	55.8	63
7	Mission De Oro	N. of Browning	51.9	44.7	46.9	54

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

Project #: 104
Description: Short-term No Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	-------- Distances to Traffic Noise Contours -------- 75	70	65	60	55
1	Browning	W. of Hilltop	3	6	12	26	55
2	Browning	E. of Hilltop	11	25	53	115	248
3	Hilltop	N. of Browning	15	32	68	147	316
4	Hilltop	S. of Browning	13	29	62	135	290
5	Browning	W. of Mission De Oro	12	25	55	118	255
6	Browning	E. of Mission De Oro	11	24	51	111	239
7	Mission De Oro	N. of Browning	3	6	13	28	61

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

Data Input Sheet

Project #: 104
Description: Short-term Plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Browning	W. of Hilltop	1,290	85		15	2	1	35	75	
2	Browning	E. of Hilltop	13,530	85		15	2	1	35	75	
3	Hilltop	N. of Browning	17,390	85		15	2	1	35	75	
4	Hilltop	S. of Browning	15,830	85		15	2	1	35	75	
5	Browning	W. of Mission De Oro	13,590	85		15	2	1	35	75	
6	Browning	E. of Mission De Oro	11,650	85		15	2	1	35	75	
7	Mission De Oro	N. of Browning	3,290	85		15	2	1	35	75	
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FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Predicted Levels

Project #: 104
Description: Short-term Plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Browning	W. of Hilltop	51.3	44.1	46.3	53
2	Browning	E. of Hilltop	61.5	54.4	56.5	63
3	Hilltop	N. of Browning	62.6	55.4	57.6	64
4	Hilltop	S. of Browning	62.2	55.0	57.2	64
5	Browning	W. of Mission De Oro	61.5	54.4	56.6	63
6	Browning	E. of Mission De Oro	60.9	53.7	55.9	63
7	Mission De Oro	N. of Browning	55.4	48.2	50.4	57

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

Project #: 104
Description: Short-term Plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	-------- Distances to Traffic Noise Contours -------- 75	70	65	60	55
1	Browning	W. of Hilltop	3	6	12	26	56
2	Browning	E. of Hilltop	12	27	58	125	269
3	Hilltop	N. of Browning	15	32	68	147	318
4	Hilltop	S. of Browning	14	30	64	138	298
5	Browning	W. of Mission De Oro	13	27	58	125	269
6	Browning	E. of Mission De Oro	11	24	52	113	243
7	Mission De Oro	N. of Browning	5	10	23	49	105

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

Data Input Sheet

Project #: 104
Description: Cumulative No Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Browning	W. of Hilltop	1,260	85		15	2	1	35	75	
2	Browning	E. of Hilltop	14,210	85		15	2	1	35	75	
3	Hilltop	N. of Browning	20,540	85		15	2	1	35	75	
4	Hilltop	S. of Browning	18,310	85		15	2	1	35	75	
5	Browning	W. of Mission De Oro	14,190	85		15	2	1	35	75	
6	Browning	E. of Mission De Oro	12,850	85		15	2	1	35	75	
7	Mission De Oro	N. of Browning	2,690	85		15	2	1	35	75	
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FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Predicted Levels

Project #: 104
Description: Cumulative No Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Browning	W. of Hilltop	51.2	44.0	46.2	53
2	Browning	E. of Hilltop	61.7	54.6	56.8	64
3	Hilltop	N. of Browning	63.3	56.2	58.4	65
4	Hilltop	S. of Browning	62.8	55.7	57.9	65
5	Browning	W. of Mission De Oro	61.7	54.6	56.7	64
6	Browning	E. of Mission De Oro	61.3	54.1	56.3	63
7	Mission De Oro	N. of Browning	54.5	47.3	49.5	56

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

Project #: 104
Description: Cumulative No Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	-------- Distances to Traffic Noise Contours -------- 75	70	65	60	55
1	Browning	W. of Hilltop	3	6	12	26	55
2	Browning	E. of Hilltop	13	28	60	129	278
3	Hilltop	N. of Browning	16	35	76	165	355
4	Hilltop	S. of Browning	15	33	71	153	329
5	Browning	W. of Mission De Oro	13	28	60	129	277
6	Browning	E. of Mission De Oro	12	26	56	120	260
7	Mission De Oro	N. of Browning	4	9	20	42	92

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

Data Input Sheet

Project #: 104
Description: Cumulative Plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Browning	W. of Hilltop	1,290	85		15	2	1	35	75	
2	Browning	E. of Hilltop	11,600	85		15	2	1	35	75	
3	Hilltop	N. of Browning	21,050	85		15	2	1	35	75	
4	Hilltop	S. of Browning	19,380	85		15	2	1	35	75	
5	Browning	W. of Mission De Oro	15,820	85		15	2	1	35	75	
6	Browning	E. of Mission De Oro	13,060	85		15	2	1	35	75	
7	Mission De Oro	N. of Browning	4,530	85		15	2	1	35	75	
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Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Browning	W. of Hilltop	51.3	44.1	46.3	53
2	Browning	E. of Hilltop	60.9	53.7	55.9	63
3	Hilltop	N. of Browning	63.4	56.3	58.5	65
4	Hilltop	S. of Browning	63.1	55.9	58.1	65
5	Browning	W. of Mission De Oro	62.2	55.0	57.2	64
6	Browning	E. of Mission De Oro	61.4	54.2	56.4	63
7	Mission De Oro	N. of Browning	56.8	49.6	51.8	59

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

Noise Contour Output

Project #: 104
Description: Cumulative Plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	-------- Distances to Traffic Noise Contours -------- 75	70	65	60	55
1	Browning	W. of Hilltop	3	6	12	26	56
2	Browning	E. of Hilltop	11	24	52	113	242
3	Hilltop	N. of Browning	17	36	78	167	361
4	Hilltop	S. of Browning	16	34	74	158	341
5	Browning	W. of Mission De Oro	14	30	64	138	298
6	Browning	E. of Mission De Oro	12	26	57	122	262
7	Mission De Oro	N. of Browning	6	13	28	60	130