Appendix I

Noise Calculations

Daytime Construction Activities-Heavy Duty Equipment

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (L_{eq} dBA)
threshold	4,258	55.0
Center	5000	53.6
Staging Area	3000	58.0

Equipment	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Vibratory Pile Driver	95	0.4
Backhoe	80	0.4
Concrete Mixer Truck	85	0.16
Concrete Pump Truck	82	0.4
Crane	85	0.4
Dozer	85	0.4
Man Lift	85	0.4
Generator	82	0.4
Front End Loader	80	0.2
Paver	85	0.4
Pneumatic Tools	85	0.5
Scraper	85	0.4
Pickup Truck	55	0.4

Ground Type	hard
Source Height	8
Receiver Height	5
Ground Factor[2]	0.00

Predicted Noise Level [3]	L_{eq} dBA at 50 feet[3]
Vibratory Pile Driver	91.0
Backhoe	76.0
Concrete Mixer Truck	77.0
Concrete Pump Truck	78.0
Crane	81.0
Dozer	81.0
Man Lift	81.0
Generator	78.0
Front End Loader	73.0
Paver	81.0
Pneumatic Tools	82.0
Scraper	81.0
Pickup Truck	51.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
93.6

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006. Table 1.

[2] Based on Figure 6-5 from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 6-23).

[3] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 12-3).

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects (FTA 2006: pg 6-23); and

D = Distance from source to receiver.

Daytime Construction Activities-Heavy Duty Equipment

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (L_{eq} dBA)
threshold	6,826	55.0
Center	5000	57.7
Staging Area	3000	62.1

Equipment	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Vibratory Pile Driver	95	1
Backhoe	80	1
Concrete Mixer Truck	85	1
Concrete Pump Truck	82	1
Crane	85	1
Dozer	85	1
Man Lift	85	1
Generator	82	1
Front End Loader	80	1
Paver	85	1
Pneumatic Tools	85	1
Scraper	85	1
Pickup Truck	55	1

Ground Type	hard
Source Height	8
Receiver Height	5
Ground Factor[2]	0.00

Predicted Noise Level [3]	L_{eq} dBA at 50 feet[3]
Vibratory Pile Driver	95.0
Backhoe	80.0
Concrete Mixer Truck	85.0
Concrete Pump Truck	82.0
Crane	85.0
Dozer	85.0
Man Lift	85.0
Generator	82.0
Front End Loader	80.0
Paver	85.0
Pneumatic Tools	85.0
Scraper	85.0
Pickup Truck	55.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
97.7

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006. Table 1.

[2] Based on Figure 6-5 from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 6-23).

[3] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 12-3).

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects (FTA 2006: pg 6-23); and

D = Distance from source to receiver.

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Night Time Construction Activities-Heavy Duty Equipment

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (L_{eq} dBA)
Threshold	2,541	45.0
Center	50	79.1

Equipment	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Concrete Pump Truck	82	0.2
Drum Mixer	80	0.5

Ground Type	hard
Source Height	8
Receiver Height	5
Ground Factor[2]	0.00

Predicted Noise Level [3]	L_{eq} dBA at 50 feet[3]
Concrete Pump Truck	75.0
Drum Mixer	77.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
79.1

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006. Table 1.

[2] Based on Figure 6-5 from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 6-23).

[3] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 12-3).

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects (FTA 2006: pg 6-23); and

D = Distance from source to receiver.

Night Time Construction Activities-Heavy Duty Equipment

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (L_{eq} dBA)
Threshold	452	65.0
Center	5000	44.1

Equipment	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Concrete Pump Truck	82	1
Drum Mixer	80	1

Ground Type	hard
Source Height	8
Receiver Height	5
Ground Factor[2]	0.00

Predicted Noise Level [3]	L_{eq} dBA at 50 feet[3]
Concrete Pump Truck	82.0
Drum Mixer	80.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
84.1

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006. Table 1.

[2] Based on Figure 6-5 from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 6-23).

[3] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 12-3).

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects (FTA 2006: pg 6-23); and

D = Distance from source to receiver.

Combined Construction Noise (Traffic + Heavy Duty Equipment)

Max Construction Noise (Construction Equipment + Traffic)

Traffic @ SR	47.0
Staging Area @ SR	52.9
Center of Site @ SR	48.5
Combined Leq	**53.9**

Equipment Description	Acoustical Usage Factor (%)	Spec 721.560 Lmax @ 50ft (dBA slow)	Actual Measured Lmax @ 50ft (dBA slow)	No. of Actual Data Samples (count)	Spec 721.560 LmaxCalc	Spec 721.560 Leq	Distance	Actual Measured LmaxCalc	Actual Measured Leq
Auger Drill Rig	20	85	84	36	79.0	72.0	100	78.0	71.0
Backhoe	40	80	78	372	74.0	70.0	100	72.0	68.0
Bar Bender	20	80	na	0	74.0	67.0	100		
Blasting	na	94	na	0	88.0		100		
Boring Jack Power Unit	50	80	83	1	74.0	71.0	100	77.0	74.0
Chain Saw	20	85	84	46	79.0	72.0	100	78.0	71.0
Clam Shovel (dropping)	20	93	87	4	87.0	80.0	100	81.0	74.0
Compactor (ground)	20	80	83	57	74.0	67.0	100	77.0	70.0
Compressor (air)	40	80	78	18	74.0	70.0	100	72.0	68.0
Concrete Batch Plant	15	83	na	0	77.0	68.7	100		
Concrete Mixer Truck	40	85	79	40	79.0	75.0	100	73.0	69.0
Concrete Pump Truck	20	82	81	30	76.0	69.0	100	75.0	68.0
Concrete Saw	20	90	90	55	84.0	77.0	100	84.0	77.0
Crane	16	85	81	405	79.0	71.0	100	75.0	67.0
Dozer	40	85	82	55	79.0	75.0	100	76.0	72.0
Drill Rig Truck	20	84	79	22	78.0	71.0	100	73.0	66.0
Drum Mixer	50	80	80	1	74.0	71.0	100	74.0	71.0
Dump Truck	40	84	76	31	78.0	74.0	100	70.0	66.0
Excavator	40	85	81	170	79.0	75.0	100	75.0	71.0
Flat Bed Truck	40	84	74	4	78.0	74.0	100	68.0	64.0
Front End Loader	40	80	79	96	74.0	70.0	100	73.0	69.0
Generator	50	82	81	19	76.0	73.0	100	75.0	72.0
Generator (<25KVA, VMS s	50	70	73	74	64.0	61.0	100	67.0	64.0
Gradall	40	85	83	70	79.0	75.0	100	77.0	73.0
Grader	40	85	na	0	79.0	75.0	100		
Grapple (on Backhoe)	40	85	87	1	79.0	75.0	100	81.0	77.0
Horizontal Boring Hydr. Jac	25	80	82	6	74.0	68.0	100	76.0	70.0
Hydra Break Ram	10	90	na	0	84.0	74.0	100		
Impact Pile Driver	20	95	101	11	89.0	82.0	100	95.0	88.0
Jackhammer	20	85	89	133	79.0	72.0	100	83.0	76.0
Man Lift	20	85	75	23	79.0	72.0	100	69.0	62.0
Mounted Impact Hammer	20	90	90	212	84.0	77.0	100	84.0	77.0
Pavement Scarafier	20	85	90	2	79.0	72.0	100	84.0	77.0
Paver	50	85	77	9	79.0	76.0	100	71.0	68.0
Pickup Truck	40	55	75	1	49.0	45.0	100	69.0	65.0
Pneumatic Tools	50	85	85	90	79.0	76.0	100	79.0	76.0
Pumps	50	77	81	17	71.0	68.0	100	75.0	72.0
Refrigerator Unit	100	82	73	3	76.0	76.0	100	67.0	67.0
Rivit Buster/chipping gun	20	85	79	19	79.0	72.0	100	73.0	66.0
Rock Drill	20	85	81	3	79.0	72.0	100	75.0	68.0
Roller	20	85	80	16	79.0	72.0	100	74.0	67.0
Sand Blasting (Single Nozzl	20	85	96	9	79.0	72.0	100	90.0	83.0
Scraper	40	85	84	12	79.0	75.0	100	78.0	74.0
Shears (on backhoe)	40	85	96	5	79.0	75.0	100	90.0	86.0
Slurry Plant	100	78	78	1	72.0	72.0	100	72.0	72.0
Slurry Trenching Machine	50	82	80	75	76.0	73.0	100	74.0	71.0
Soil Mix Drill Rig	50	80	na	0	74.0	71.0	100		
Tractor	40	84	na	0	78.0	74.0	100		
Vacuum Excavator (Vac-tru	40	85	85	149	79.0	75.0	100	79.0	75.0
Vacuum Street Sweeper	10	80	82	19	74.0	64.0	100	76.0	66.0
Ventilation Fan	100	85	79	13	79.0	79.0	100	73.0	73.0
Vibrating Hopper	50	85	87	1	79.0	76.0	100	81.0	78.0
Vibratory Concrete Mixer	20	80	80	1	74.0	67.0	100	74.0	67.0
Vibratory Pile Driver	20	95	101	44	89.0	82.0	100	95.0	88.0
Warning Horn	5	85	83	12	79.0	66.0	100	77.0	64.0
Welder / Torch	40	73	74	5	67.0	63.0	100	68.0	64.0

Source:
FHWA Roadway Construction Noise Model, January 2006. Table 9.1
U.S. Department of Transportation
CA/T Construction Spec. 721.560

Distance Propagation Calculations for Stationary Sources of Ground Vibration

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KEY: Orange cells are for input.
Grey cells are intermediate calculations performed by the model.
Green cells are data to present in a written analysis (output).

STEP 1: Determine units in which to perform calculation.
— If vibration decibels (VdB), then use Table A and proceed to Steps 2A and 3A.
— If peak particle velocity (PPV), then use Table B and proceed to Steps 2B and 3B.

STEP 2A: Identify the vibration source and enter the reference vibration level (VdB) and distance.

STEP 3A: Select the distance to the receiver.

Table A. Propagation of vibration decibels (VdB) with distance

Noise Source/ID	Reference Noise Level			Attenuated Noise Level at Receptor		
	vibration level (VdB)	@	distance (ft)	vibration level (VdB)	@	distance (ft)
Impact pile driver	112	@	25	79.6	@	300
blasting	109	@	25	79.0	@	250
sonic pile driving	104	@	25	80.7	@	150

STEP 2B: Identify the vibration source and enter the reference peak particle velocity (PPV) and distance.

STEP 3B: Select the distance to the receiver.

Table B. Propagation of peak particle velocity (PPV) with distance

Noise Source/ID	Reference Noise Level			Attenuated Noise Level at Receptor		
	vibration level (PPV)	@	distance (ft)	vibration level (PPV)	@	distance (ft)
Impact pile driver	1.518	@	25	0.190	@	100
blasting	1.130	@	25	0.217	@	75
sonic pile driving	0.734	@	25	0.197	@	60

Notes:
Computation of propagated vibration levels is based on the equations presented on pg. 12-11 of FTA 2006. Estimates of attenuated vibration levels do not account for reductions from intervening underground barriers or other underground structures of any type, or changes in soil type.

Sources:
Federal Transit Association (FTA). 2006 (May). Transit Noise and Vibration Impact Assessment. FTA-VA-90-1003-06. Washington, D.C. Available: <http://www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf>. Accessed: September 24, 2010.

Attenuation Calculations for Stationary Noise Sources

KEY: Orange cells are for input.
Grey cells are intermediate calculations performed by the model.
Green cells are data to present in a written analysis (output).

STEP 1: Identify the noise source and enter the reference noise level (dBA and distance).

STEP 2: Select the ground type (hard or soft), and enter the source and receiver heights.

STEP 3: Select the distance to the receiver.

Noise Source/ID	Reference Noise Level			Attenuation Characteristics				Attenuated Noise Level at Receptor		
	noise level (dBA)	@	distance (ft)	Ground Type (soft/hard)	Source Height (ft)	Receiver Height (ft)	Ground Factor	noise level (dBA)	@	distance (ft)
Electrical Gen (Leq)	73.0	@	45	hard	6	5	0.66	55.8	@	200
Electrical Gen (Lmax)	84.0	@	45	hard	6	5	0.66	70.1	@	150
Electrical Gen (Leq)	73.0	@	45	hard	6	5	0.66	45.2	@	500
Electrical Gen (Lmax)	84.0	@	45	hard	6	5	0.66	65.2	@	230
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			

Notes:

Estimates of attenuated noise levels do not account for reductions from intervening barriers, including walls, trees, vegetation, or structures of any type.

Computation of the attenuated noise level is based on the equation presented on pg. 12-3 and 12-4 of FTA 2006.

Computation of the ground factor is based on the equation presentd in Figure 6-23 on pg. 6-23 of FTA 2006, where the distance of the reference noise leve can be adjusted and the usage factor is not applied (i.e., the usage factor is equal to 1).

Sources:

Federal Transit Association (FTA). 2006 (May). Transit Noise and Vibration Impact Assessment. FTA-VA-90-1003-06. Washington, D.C. Available: <http://www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf>. Accessed: September 24, 2010.

Attenuation Calculations for Stationary Noise Sources

KEY: Orange cells are for input.

Grey cells are intermediate calculations performed by the model.

Green cells are data to present in a written analysis (output).

STEP 1: Identify the noise source and enter the reference noise level (dBA and distance).

STEP 2: Select the ground type (hard or soft), and enter the source and receiver heights.

STEP 3: Select the distance to the receiver.

Noise Source/ID	**Reference Noise Level** noise level (dBA)	@	distance (ft)	**Attenuation Characteristics** Ground Type (soft/hard)	Source Height (ft)	Receiver Height (ft)	Ground Factor	**Attenuated Noise Level at Receptor** noise level (dBA)	@	distance (ft)
Parking Lot (Leq)	59.8	@	15	hard	6	5	0.66	55.4	@	22
Parking Lot (Lmax)	78.1	@	15	hard	6	5	0.66	70.1	@	30
Parking Lot (Leq)	59.8	@	15	hard	6	5	0.66	45.4	@	52
Parking Lot (Lmax)	78.1	@	15	hard	6	5	0.66	65.4	@	45
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			

Notes:

Estimates of attenuated noise levels do not account for reductions from intervening barriers, including walls, trees, vegetation, or structures of any type.

Computation of the attenuated noise level is based on the equation presented on pg. 12-3 and 12-4 of FTA 2006.

Computation of the ground factor is based on the equation presentd in Figure 6-23 on pg. 6-23 of FTA 2006, where the distance of the reference noise leve can be adjusted and the usage factor is not applied (i.e., the usage factor is equal to 1).

Sources:

Federal Transit Association (FTA). 2006 (May). Transit Noise and Vibration Impact Assessment. FTA-VA-90-1003-06. Washington, D.C. Available: <http://www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf>. Accessed: September 24, 2010.

Attenuation Calculations for Stationary Noise Sources

KEY: Orange cells are for input.

Grey cells are intermediate calculations performed by the model.

Green cells are data to present in a written analysis (output).

STEP 1: Identify the noise source and enter the reference noise level (dBA and distance).

STEP 2: Select the ground type (hard or soft), and enter the source and receiver heights.

STEP 3: Select the distance to the receiver.

Noise Source/ID	Reference Noise Level			Attenuation Characteristics				Attenuated Noise Level at Receptor		
	noise level (dBA)	@	distance (ft)	Ground Type (soft/hard)	Source Height (ft)	Receiver Height (ft)	Ground Factor	noise level (dBA)	@	distance (ft)
Parking Lot (Leq)	82.0	@	50	hard	6	5	0.66	55.9	@	480
Parking Lot (Lmax)	86.0	@	50	hard	6	5	0.66	70.0	@	200
Parking Lot (Leq)	82.0	@	50	hard	6	5	0.66	45.3	@	1200
Parking Lot (Lmax)	86.0	@	50	hard	6	5	0.66	65.3	@	300
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			

Notes:

Estimates of attenuated noise levels do not account for reductions from intervening barriers, including walls, trees, vegetation, or structures of any type.

Computation of the attenuated noise level is based on the equation presented on pg. 12-3 and 12-4 of FTA 2006.

Computation of the ground factor is based on the equation presentd in Figure 6-23 on pg. 6-23 of FTA 2006, where the distance of the reference noise leve can be adjusted and the usage factor is not applied (i.e., the usage factor is equal to 1).

Sources:

Federal Transit Association (FTA). 2006 (May). Transit Noise and Vibration Impact Assessment. FTA-VA-90-1003-06. Washington, D.C. Available: <http://www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf>. Accessed: September 24, 2010.

Proposed Project- Winter Analysis

Project:

Number	Name	Segment Description and Location From	To	Existing Conditions	Existing + Project Conditions	Δ Existing – Existing + Project
Summary of Net Changes						
1	Squaw Valley Road	SR 89 and squaw creek rd		60.1	61.0	0.9
2	Squaw Valey Road	squaw creek rd and village		60.2	61.0	0.7
3	SR 89	north of Squaw Valley Road		66.3	66.7	0.4
4	SR 89	South of Squaw Valley Road		63.4	63.8	0.4

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Proposed Project- Winter Existing

Project:

Noise Level Descriptor: CNEL
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor:

			Input											Output				
	Segment Description and Location			Speed	Distance to Directional Centerline, (feet)4		Traffic Distribution Characteristics							CNEL,	Distance to Contour, (feet)3			
Number	Name		ADT	(mph)	Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve	% Night		(dBA)5,6,7	70 dBA	65 dBA	60 dBA	55 dBA
Existing Conditions																		
1	Squaw Valey Road	SR 89 and squaw creek rd	12,600	35	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%		60.1	22	47	102	219
2	Squaw Valey Road	squaw creek rd and village	12,900	35	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%		60.2	22	48	103	223
3	SR 89	north of Squaw Valley Road	15,000	55	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%		66.3	56	121	262	564
5	SR 89	South of Squaw Valley Road	13,700	45	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%		63.4	36	78	168	361

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Proposed Project- Winter Existing + Project

Project:

Noise Level Descriptor: CNEL
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor:

	Segment Description and Location			Input											Output				
					Speed	Distance to Directional Centerline, (feet)[4]		Traffic Distribution Characteristics							CNEL,	Distance to Contour, (feet)[3]			
Number	Name	From	To	ADT	(mph)	Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve	% Night		(dBA)[5,6,7]	70 dBA	65 dBA	60 dBA	55 dBA
Existing + Project Conditions																			
1	Squaw Valey Road	SR 89 and squaw creek rd		15,400	35	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%		61.0	25	54	116	251
2	Squaw Valey Road	squaw creek rd and village		15,300	35	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%		61.0	25	54	116	250
4	SR 89	north of Squaw Valley Road		16,500	55	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%		66.7	60	129	279	600
5	SR 89	South of Squaw Valley Road		15,000	45	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%		63.8	38	83	178	384

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Proposed Project- Summer Analysis

Project:

Number	Name	From	To	Existing Conditions	Existing + Project Conditions	Δ Existing – Existing + Project
	Segment Description and Location					
Summary of Net Changes						
1	Squaw Valey Road	SR 89 and squaw creek rd		59.0	63.5	4.5
2	Squaw Valey Road	squaw creek rd and village		59.7	62.8	3.1
3	SR 89	north of Squaw Valley Road		68.6	69.7	1.1
4	SR 89	South of Squaw Valley Road		66.4	67.2	0.8

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Proposed Project- Summer Existing

Project:

Noise Level Descriptor: CNEL
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor:

		Segment Description and Location		Input											Output				
						Distance to Directional Centerline, (feet)4		Traffic Distribution Characteristics							CNEL,	Distance to Contour, (feet)3			
Number	Name	From	To	ADT	Speed (mph)	Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve	% Night		(dBA)5,6,7	70 dBA	65 dBA	60 dBA	55 dBA
Cumulative Conditions																			
1	Squaw Valey Road	SR 89 and squaw creek rd		5,150	35	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		59.0	18	40	85	184
2	Squaw Valey Road	squaw creek rd and village		6,116	35	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		59.7	21	44	96	206
3	SR 89	north of Squaw Valley Road		16,700	55	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		68.6	81	174	374	806
4	SR 89	South of Squaw Valley Road		16,500	45	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		66.4	57	123	265	571

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Proposed Project- Summer Existing + Project

Project:

Noise Level Descriptor: CNEL
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor:

Number	Name	From	To	ADT	Speed (mph)	Distance to Directional Centerline, (feet)[4] Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve	% Night	CNEL, (dBA)[5,6,7]	Distance to Contour, (feet)[3] 70 dBA	65 dBA	60 dBA	55 dBA
Cumulative +Project Conditions																		
1	Squaw Valley Road	SR 89 and squaw creek rd		14,499	35	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%	63.5	37	79	170	366
2	Squaw Valey Road	squaw creek rd and village		12,501	35	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%	62.8	33	71	154	332
3	SR 89	north of Squaw Valley Road		21,600	55	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%	69.7	96	206	444	957
4	SR 89	South of Squaw Valley Road		20,000	45	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%	67.2	65	140	302	650

Input columns: ADT through % Night. Output columns: CNEL and Distance to Contour.

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Citation	Reference
1	Caltrans Technical Noise Supplement. 2009 (November). Table (5-11), Pg 5-60.
2	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-26), Pg 5-60.
3	Caltrans Technical Noise Supplement. 2009 (November). Equation (2-16), Pg 2-32.
4	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-11), Pg 5-47, 48.
5	Caltrans Technical Noise Supplement. 2009 (November). Equation (2-26), Pg 2-55, 56.
6	Caltrans Technical Noise Supplement. 2009 (November). Equation (2-27), Pg 2-57.
7	Caltrans Technical Noise Supplement. 2009 (November). Pg 2-53.
8	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-7), Pg 5-45.
9	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-8), Pg 5-45.
10	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-9), Pg 5-45.
11	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-13), Pg 5-49.
12	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-14), Pg 5-49.
13	Federal Highway Administration Traffic Noise Model Technical Manual. Report No. FHWA-PD-96-010. 1998 (January). Equation (16), Pg 67
14	Federal Highway Administration Traffic Noise Model Technical Manual. Report No. FHWA-PD-96-010. 1998 (January). Equation (20), Pg 69
15	Federal Highway Administration Traffic Noise Model Technical Manual. Report No. FHWA-PD-96-010. 1998 (January). Equation (18), Pg 69

Winter Cumulative Analysis

Project:

Number	Name	Segment Description and Location From	To	Cumulative	Existing + Project	Δ Cumulative – Cumulative + Project
Summary of Net Changes						
1	Squaw Valley Road	SR 89 and squaw creek rd		61.0	61.7	0.7
2	Squaw Valey Road	squaw creek rd and village		60.8	61.4	0.7
3	SR 89	north of Squaw Valley Road		68.8	69.3	0.5
4	SR 89	South of Squaw Valley Road		65.9	67.5	1.6

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Winter Cumulative No Project

Project:

Noise Level Descriptor: CNEL
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor:

			Input											Output				
		Segment Description and Location			Distance to Directional Centerline, (feet)4		Traffic Distribution Characteristics								Distance to Contour, (feet)3			
Number	Name		ADT	Speed (mph)	Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve	% Night	CNEL, (dBA)5,6,7		70 dBA	65 dBA	60 dBA	55 dBA
Existing Conditions																		
1	Squaw Valley Road	SR 89 and squaw creek rd	15,500	35	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	61.0		25	54	117	252
2	Squaw Valley Road	squaw creek rd and village	14,600	35	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	60.8		24	52	112	242
3	SR 89	north of Squaw Valley Road	27,000	55	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	68.8		83	180	387	834
5	SR 89	South of Squaw Valley Road	24,660	45	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	65.9		53	115	248	534

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Winter Cumulative + Project

Project:

Noise Level Descriptor: CNEL
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor:

				Input										Output				
	Segment Description and Location				Speed	Distance to Directional Centerline, (feet)[4]		Traffic Distribution Characteristics						CNEL,	Distance to Contour, (feet)[3]			
Number	Name	From	To	ADT	(mph)	Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve	% Night	(dBA)[5,6,7]	70 dBA	65 dBA	60 dBA	55 dBA
Existing + Project Conditions																		
1	Squaw Valey Road	SR 89 and squaw creek rd		18,300	35	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	61.7	28	61	131	281
2	Squaw Valey Road	squaw creek rd and village		17,000	35	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	61.4	27	58	124	268
4	SR 89	north of Squaw Valley Road		29,983	55	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	69.3	89	193	415	894
5	SR 89	South of Squaw Valley Road		35,355	45	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	67.5	68	146	315	680

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Summer Cumulative Analysis

Project:

Number	Name	Segment Description and Location From	To	Cumulative	Cumulative + Project	Δ Cumulative – Cumulative + Project
Summary of Net Changes						
1	Squaw Valley Road	SR 89 and squaw creek rd		59.9	64.2	4.3
2	Squaw Valey Road	squaw creek rd and village		60.6	63.3	2.6
3	SR 89	north of Squaw Valley Road		71.2	72.0	0.9
4	SR 89	South of Squaw Valley Road		69.7	70.7	0.9

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Summer Cumulative No Project

Project:

Noise Level Descriptor: CNEL
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor:

				Input											Output				
	Segment Description and Location					Distance to Directional Centerline, (feet)$_4$		Traffic Distribution Characteristics								Distance to Contour, (feet)$_3$			
Number	Name	From	To	ADT	Speed (mph)	Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve	% Night		CNEL, (dBA)$_{5,6,7}$	70 dBA	65 dBA	60 dBA	55 dBA
Cumulative Conditions																			
1	Squaw Valey Road	SR 89 and squaw creek rd		6,442	35	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		59.9	21	46	99	213
2	Squaw Valey Road	squaw creek rd and village		7,596	35	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		60.6	24	51	110	238
3	SR 89	north of Squaw Valley Road		30,060	55	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		71.2	119	257	554	1193
4	SR 89	South of Squaw Valley Road		36,000	45	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		69.7	96	207	446	961

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Summer Cumulative + Project

Project:

Noise Level Descriptor: CNEL
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor:

	Segment Description and Location			Input											Output				
						Distance to Directional Centerline, (feet)[4]		Traffic Distribution Characteristics							CNEL,	Distance to Contour, (feet)[3]			
Number	Name	From	To	ADT	Speed (mph)	Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve	% Night		(dBA)[5,6,7]	70 dBA	65 dBA	60 dBA	55 dBA
Cumulative +Project Conditions																			
1	Squaw Valey Road	SR 89 and squaw creek rd		17,229	35	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		64.2	41	88	191	411
2	Squaw Valey Road	squaw creek rd and village		13,890	35	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		63.3	36	77	165	356
3	SR 89	north of Squaw Valley Road		36,649	55	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		72.0	136	293	632	1362
4	SR 89	South of Squaw Valley Road		44,457	45	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		70.7	111	238	514	1106

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Citation	Reference
1	Caltrans Technical Noise Supplement. 2009 (November). Table (5-11), Pg 5-60.
2	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-26), Pg 5-60.
3	Caltrans Technical Noise Supplement. 2009 (November). Equation (2-16), Pg 2-32.
4	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-11), Pg 5-47, 48.
5	Caltrans Technical Noise Supplement. 2009 (November). Equation (2-26), Pg 2-55, 56.
6	Caltrans Technical Noise Supplement. 2009 (November). Equation (2-27), Pg 2-57.
7	Caltrans Technical Noise Supplement. 2009 (November). Pg 2-53.
8	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-7), Pg 5-45.
9	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-8), Pg 5-45.
10	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-9), Pg 5-45.
11	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-13), Pg 5-49.
12	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-14), Pg 5-49.
13	Federal Highway Administration Traffic Noise Model Technical Manual. Report No. FHWA-PD-96-010. 1998 (January). Equation (16), Pg 67
14	Federal Highway Administration Traffic Noise Model Technical Manual. Report No. FHWA-PD-96-010. 1998 (January). Equation (20), Pg 69
15	Federal Highway Administration Traffic Noise Model Technical Manual. Report No. FHWA-PD-96-010. 1998 (January). Equation (18), Pg 69

SVGPLU Development Alternative-Winter Analysis

Project:

Number	Name	Segment Description and Location From	To	Existing Conditions	Existing + Project Conditions	Δ Existing – Existing + Project
Summary of Net Changes						
1	Squaw Valey Road	SR 89 and squaw creek rd		60.1	60.7	0.6
2	Squaw Valey Road	squaw creek rd and village		60.2	60.8	0.5
3	SR 89	north of Squaw Valley Road		66.3	66.6	0.3
4	SR 89	South of Squaw Valley Road		63.4	63.6	0.3

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

SVGPLU Development Alternative-Winter Existing

Project:

Noise Level Descriptor: CNEL
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor:

			Input											Output				
		Segment Description and Location			Distance to Directional Centerline, (feet)$_4$		Traffic Distribution Characteristics							CNEL,	Distance to Contour, (feet)$_3$			
Number	Name		ADT	Speed (mph)	Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve	% Night		(dBA)$_{5,6,7}$	70 dBA	65 dBA	60 dBA	55 dBA
Existing Conditions																		
1	Squaw Valley Road	SR 89 and squaw creek rd	12,600	35	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%		60.1	22	47	102	219
2	Squaw Valley Road	squaw creek rd and village	12,900	35	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%		60.2	22	48	103	223
3	SR 89	north of Squaw Valley Road	15,000	55	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%		66.3	56	121	262	564
5	SR 89	South of Squaw Valley Road	13,700	45	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%		63.4	36	78	168	361
						.												

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

SVGPLU Development Alternative-Winter Existing + Project

Project:

Noise Level Descriptor: CNEL
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor:

Number	Name	From	To	ADT	Speed (mph)	Distance to Directional Centerline, (feet)[4] Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve	% Night	CNEL, (dBA)[5,6,7]	Distance to Contour, (feet)[3] 70 dBA	65 dBA	60 dBA	55 dBA
Existing + Project Conditions																		
1	Squaw Valey Road	SR 89 and squaw creek rd		14,560	35	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	60.7	24	52	112	241
2	Squaw Valey Road	squaw creek rd and village		14,589	35	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	60.8	24	52	112	242
4	SR 89	north of Squaw Valley Road		16,050	55	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	66.6	59	127	274	590
5	SR 89	South of Squaw Valley Road		14,610	45	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	63.6	38	81	175	377

Input: Segment Description and Location through Traffic Distribution Characteristics; Output: CNEL and Distance to Contour.

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

SVGPLU Development Alternative-Summer Analysis

Project:

Number	Segment Description and Location Name	From	To	Existing Conditions	Existing + Project Conditions	Δ Existing – Existing + Project
Summary of Net Changes						
1	Squaw Valley Road	SR 89 and squaw creek rd		59.0	62.1	3.1
2	Squaw Valley Road	squaw creek rd and village		59.7	61.8	2.1
3	SR 89	north of Squaw Valley Road		68.6	69.3	0.7
4	SR 89	South of Squaw Valley Road		66.4	66.9	0.5

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Traffic N SVGPLU Development Alternative-Summer Existing

Project:

Noise Level Descriptor: CNEL
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor:

	Segment Description and Location			Input												Output				
						Distance to Directional Centerline, (feet)4		Traffic Distribution Characteristics								CNEL,	Distance to Contour, (feet)3			
Number	Name	From	To	ADT	Speed (mph)	Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve	% Night			(dBA)5,6,7	70 dBA	65 dBA	60 dBA	55 dBA
Cumulative Conditions																				
1	Squaw Valey Road	SR 89 and squaw creek rd		5,150	35	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%			59.0	18	40	85	184
2	Squaw Valey Road	squaw creek rd and village		6,116	35	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%			59.7	21	44	96	206
3	SR 89	north of Squaw Valley Road		16,700	55	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%			68.6	81	174	374	806
4	SR 89	South of Squaw Valley Road		16,500	45	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%			66.4	57	123	265	571

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

SVGPLU Development Alternative-Summer Existing + Project

Project:

Noise Level Descriptor: CNEL
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor:

				Input											Output				
	Segment Description and Location					Distance to Directional Centerline, (feet)[4]		Traffic Distribution Characteristics								Distance to Contour, (feet)[3]			
Number	Name	From	To	ADT	Speed (mph)	Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve	% Night		CNEL, (dBA)[5,6,7]	70 dBA	65 dBA	60 dBA	55 dBA
Cumulative +Project Conditions																			
1	Squaw Valey Road	SR 89 and squaw creek rd		10,572	35	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		62.1	30	64	138	297
2	Squaw Valey Road	squaw creek rd and village		9,819	35	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		61.8	28	61	131	282
3	SR 89	north of Squaw Valley Road		19,542	55	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		69.3	90	193	416	895
4	SR 89	South of Squaw Valley Road		18,530	45	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		66.9	62	133	287	617

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Citation	Reference
1	Caltrans Technical Noise Supplement. 2009 (November). Table (5-11), Pg 5-60.
2	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-26), Pg 5-60.
3	Caltrans Technical Noise Supplement. 2009 (November). Equation (2-16), Pg 2-32.
4	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-11), Pg 5-47, 48.
5	Caltrans Technical Noise Supplement. 2009 (November). Equation (2-26), Pg 2-55, 56.
6	Caltrans Technical Noise Supplement. 2009 (November). Equation (2-27), Pg 2-57.
7	Caltrans Technical Noise Supplement. 2009 (November). Pg 2-53.
8	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-7), Pg 5-45.
9	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-8), Pg 5-45.
10	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-9), Pg 5-45.
11	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-13), Pg 5-49.
12	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-14), Pg 5-49.
13	Federal Highway Administration Traffic Noise Model Technical Manual. Report No. FHWA-PD-96-010. 1998 (January). Equation (16), Pg 67
14	Federal Highway Administration Traffic Noise Model Technical Manual. Report No. FHWA-PD-96-010. 1998 (January). Equation (20), Pg 69
15	Federal Highway Administration Traffic Noise Model Technical Manual. Report No. FHWA-PD-96-010. 1998 (January). Equation (18), Pg 69

Reduced Density Alternative- Winter Analysis

Project:

Number	Name	Segment Description and Location From	To
Summary of Net Changes			
1	Squaw Valley Road	SR 89 and squaw creek rd	
2	Squaw Valey Road	squaw creek rd and village	
3	SR 89	north of Squaw Valley Road	
4	SR 89	South of Squaw Valley Road	

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Reduced Density Alternative- Winter Existing

Project:

Noise Level Descriptor: CNEL
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor:

		Segment Description and Location	Input											Output				
				Speed	Distance to Directional Centerline, (feet)4		Traffic Distribution Characteristics						CNEL,	Distance to Contour, (feet)3			
Number	Name		ADT	(mph)	Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve	% Night	(dBA)5,6,7	70 dBA	65 dBA	60 dBA	55 dBA
Existing Conditions																	
1	Squaw Valey Road	SR 89 and squaw creek rd	12,600	35	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	60.1	22	47	102	219
2	Squaw Valey Road	squaw creek rd and village	12,900	35	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	60.2	22	48	103	223
3	SR 89	north of Squaw Valley Road	15,000	55	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	66.3	56	121	262	564
5	SR 89	South of Squaw Valley Road	13,700	45	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	63.4	36	78	168	361
						.											

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Reduced Density Alternative- Winter Existing + Project

Project:

Noise Level Descriptor: CNEL
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor:

		Segment Description and Location		Input											Output				
						Distance to Directional Centerline, (feet)4		Traffic Distribution Characteristics								Distance to Contour, (feet)3			
Number	Name	From	To	ADT	Speed (mph)	Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve	% Night	CNEL, (dBA)5,6,7	70 dBA	65 dBA	60 dBA	55 dBA
Existing + Project Conditions																		
1	Squaw Valey Road	SR 89 and squaw creek rd		13,972	35	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	60.6	23	51	109	235
2	Squaw Valey Road	squaw creek rd and village		14,076	35	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	60.6	24	51	110	236
4	SR 89	north of Squaw Valley Road		15,735	55	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	66.5	58	125	270	582
5	SR 89	South of Squaw Valley Road		14,337	45	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	63.6	37	80	173	372

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Reduced Density Alternative- Summer Analysis

Project:

Number	Name	Segment Description and Location From	To	Existing Conditions	Existing + Project Conditions	Δ Existing – Existing + Project
Summary of Net Changes						
1	Squaw Valey Road	SR 89 and squaw creek rd		59.0	61.7	2.8
2	Squaw Valey Road	squaw creek rd and village		59.7	61.5	1.8
3	SR 89	north of Squaw Valley Road		68.6	69.2	0.6
4	SR 89	South of Squaw Valley Road		66.4	66.8	0.4

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Reduced Density Alternative- Summer Existing

Project:

Noise Level Descriptor: CNEL
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor:

	Segment Description and Location			Input											Output				
						Distance to Directional Centerline, (feet)4		Traffic Distribution Characteristics							CNEL,	Distance to Contour, (feet)3			
Number	Name	From	To	ADT	Speed (mph)	Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve	% Night		(dBA)5,6,7	70 dBA	65 dBA	60 dBA	55 dBA
Cumulative Conditions																			
1	Squaw Valey Road	SR 89 and squaw creek rd		5,150	35	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		59.0	18	40	85	184
2	Squaw Valey Road	squaw creek rd and village		6,116	35	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		59.7	21	44	96	206
3	SR 89	north of Squaw Valley Road		16,700	55	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		68.6	81	174	374	806
4	SR 89	South of Squaw Valley Road		16,500	45	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		66.4	57	123	265	571

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Reduced Density Alternative- Summer Existing + Project

Project:

Noise Level Descriptor: CNEL
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor:

				Input										Output				
	Segment Description and Location					Distance to Directional Centerline, (feet)[4]		Traffic Distribution Characteristics						CNEL,	Distance to Contour, (feet)[3]			
Number	Name	From	To	ADT	Speed (mph)	Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve	% Night	(dBA)[5,6,7]	70 dBA	65 dBA	60 dBA	55 dBA
Cumulative +Project Conditions																		
1	Squaw Valley Road	SR 89 and squaw creek rd		9,731	35	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%	61.7	28	60	130	281
2	Squaw Valley Road	squaw creek rd and village		9,244	35	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%	61.5	27	58	126	271
3	SR 89	north of Squaw Valley Road		19,101	55	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%	69.2	88	190	409	882
4	SR 89	South of Squaw Valley Road		18,215	45	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%	66.8	61	132	283	610

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Citation	Reference
1	Caltrans Technical Noise Supplement. 2009 (November). Table (5-11), Pg 5-60.
2	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-26), Pg 5-60.
3	Caltrans Technical Noise Supplement. 2009 (November). Equation (2-16), Pg 2-32.
4	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-11), Pg 5-47, 48.
5	Caltrans Technical Noise Supplement. 2009 (November). Equation (2-26), Pg 2-55, 56.
6	Caltrans Technical Noise Supplement. 2009 (November). Equation (2-27), Pg 2-57.
7	Caltrans Technical Noise Supplement. 2009 (November). Pg 2-53.
8	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-7), Pg 5-45.
9	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-8), Pg 5-45.
10	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-9), Pg 5-45.
11	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-13), Pg 5-49.
12	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-14), Pg 5-49.
13	Federal Highway Administration Traffic Noise Model Technical Manual. Report No. FHWA-PD-96-010. 1998 (January). Equation (16), Pg 67
14	Federal Highway Administration Traffic Noise Model Technical Manual. Report No. FHWA-PD-96-010. 1998 (January). Equation (20), Pg 69
15	Federal Highway Administration Traffic Noise Model Technical Manual. Report No. FHWA-PD-96-010. 1998 (January). Equation (18), Pg 69

Traffic Noise Spreadsheet Calculator

Project:

Number	Segment Description and Location: Name	From	To	Existing Conditions	Existing + Project Conditions	Δ Existing – Existing + Project
Summary of Net Changes						
1	Squaw Valley Road	SR 89 and squaw creek rd		60.1	60.9	0.8
2	Squaw Valey Road	squaw creek rd and village		60.2	60.9	0.7
3	SR 89	north of Squaw Valley Road		66.3	66.6	0.4
4	SR 89	South of Squaw Valley Road		63.4	63.7	0.4

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Traffic Noise Spreadsheet Calculator

Project:

Noise Level Descriptor: CNEL
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor:

Number	Name	Segment Description and Location	ADT	Speed (mph)	Distance to Directional Centerline, (feet)[4] Near	Far	Traffic Distribution Characteristics % Auto	% Medium	% Heavy	% Day	% Eve	% Night	CNEL, (dBA)[5,6,7]	Distance to Contour, (feet)[3] 70 dBA	65 dBA	60 dBA	55 dBA
Existing Conditions																	
1	Squaw Valey Road	SR 89 and squaw creek rd	12,600	35	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	60.1	22	47	102	219
2	Squaw Valey Road	squaw creek rd and village	12,900	35	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	60.2	22	48	103	223
3	SR 89	north of Squaw Valley Road	15,000	55	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	66.3	56	121	262	564
5	SR 89	South of Squaw Valley Road	13,700	45	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	63.4	36	78	168	361

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Traffic Noise Spreadsheet Calculator

Project:

Noise Level Descriptor: CNEL
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor:

Number	Name	From	To	ADT	Speed (mph)	Distance to Directional Centerline, (feet)4 Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve	% Night	CNEL, (dBA)5,6,7	Distance to Contour, (feet)3 70 dBA	65 dBA	60 dBA	55 dBA
Existing + Project Conditions																		
1	Squaw Valey Road	SR 89 and squaw creek rd		15,092	35	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	60.9	25	53	115	247
2	Squaw Valey Road	squaw creek rd and village		15,036	35	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	60.9	25	53	115	247
4	SR 89	north of Squaw Valley Road		16,335	55	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	66.6	60	129	277	596
5	SR 89	South of Squaw Valley Road		14,857	45	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	63.7	38	82	177	381

Columns ADT through % Night are under **Input** (Traffic Distribution Characteristics: % Auto – % Night); CNEL and Distance to Contour are under **Output**. Segment Description and Location: Name, From, To.

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Traffic Noise Spreadsheet Calculator

Project:

Number	Name	Segment Description and Location From	To	Existing Conditions	Existing + Project Conditions	Δ Existing – Existing + Project
Summary of Net Changes						
1	Squaw Valley Road	SR 89 and squaw creek rd		59.0	62.9	4.0
2	Squaw Valey Road	squaw creek rd and village		59.7	62.4	2.7
3	SR 89	north of Squaw Valley Road		68.6	69.5	0.9
4	SR 89	South of Squaw Valley Road		66.4	67.1	0.7

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Traffic Noise Spreadsheet Calculator

Project:

Noise Level Descriptor: CNEL
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor:

	Segment Description and Location			Input											Output				
						Distance to Directional Centerline, (feet)4		Traffic Distribution Characteristics							CNEL,	Distance to Contour, (feet)3			
Number	Name	From	To	ADT	Speed (mph)	Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve	% Night		(dBA)5,6,7	70 dBA	65 dBA	60 dBA	55 dBA
Cumulative Conditions																			
1	Squaw Valley Road	SR 89 and squaw creek rd		5,150	35	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		59.0	18	40	85	184
2	Squaw Valley Road	squaw creek rd and village		6,116	35	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		59.7	21	44	96	206
3	SR 89	north of Squaw Valley Road		16,700	55	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		68.6	81	174	374	806
4	SR 89	South of Squaw Valley Road		16,500	45	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		66.4	57	123	265	571

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Traffic Noise Spreadsheet Calculator

Project:

Noise Level Descriptor: CNEL
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor:

	Segment Description and Location			Input											Output				
						Distance to Directional Centerline, (feet)4		Traffic Distribution Characteristics							CNEL,	Distance to Contour, (feet)3			
Number	Name	From	To	ADT	Speed (mph)	Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve	% Night		(dBA)5,6,7	70 dBA	65 dBA	60 dBA	55 dBA
Cumulative +Project Conditions																			
1	Squaw Valley Road	SR 89 and squaw creek rd		12,909	35	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		62.9	34	73	157	339
2	Squaw Valley Road	squaw creek rd and village		11,415	35	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		62.4	31	67	145	312
3	SR 89	north of Squaw Valley Road		20,767	55	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		69.5	93	201	433	932
4	SR 89	South of Squaw Valley Road		19,405	45	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%		67.1	64	137	296	637

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Citation	Reference
1	Caltrans Technical Noise Supplement. 2009 (November). Table (5-11), Pg 5-60.
2	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-26), Pg 5-60.
3	Caltrans Technical Noise Supplement. 2009 (November). Equation (2-16), Pg 2-32.
4	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-11), Pg 5-47, 48.
5	Caltrans Technical Noise Supplement. 2009 (November). Equation (2-26), Pg 2-55, 56.
6	Caltrans Technical Noise Supplement. 2009 (November). Equation (2-27), Pg 2-57.
7	Caltrans Technical Noise Supplement. 2009 (November). Pg 2-53.
8	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-7), Pg 5-45.
9	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-8), Pg 5-45.
10	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-9), Pg 5-45.
11	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-13), Pg 5-49.
12	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-14), Pg 5-49.
13	Federal Highway Administration Traffic Noise Model Technical Manual. Report No. FHWA-PD-96-010. 1998 (January). Equation (16), Pg 67
14	Federal Highway Administration Traffic Noise Model Technical Manual. Report No. FHWA-PD-96-010. 1998 (January). Equation (20), Pg 69
15	Federal Highway Administration Traffic Noise Model Technical Manual. Report No. FHWA-PD-96-010. 1998 (January). Equation (18), Pg 69

Traffic Noise Model Inputs

#	Study Road Segments	Winter Saturday Existing ADT[1]	Winter Saturday Ext + Pro ADT[1]	Summer Friday Existing ADT[1,2]	Summer Friday Ext + Pro ADT[1,2]		
1	Squaw Valley Road between SR 89 and Squaw Creek Road	12600	15400	5150	14499	9349	
2	Squaw Valley Road between Squaw Creek Road and village area	12900	15300	6116	12501	6385	
3	SR 89 north of Squaw Valley Road	15000	16500	16700	21600	4900	
4	SR 89 south of Squaw Valley Road	13700	15000	16500	20000	3500	8400

K-Factor Calc

#	Segment	Winter Existing Pk Vol[3]	Winter Existing ADT	Winter Existing K-Factor[4]	Winter Existing + Project Pk Vol[3]	Winter Existing + Project ADT	Winter Existing + Project K-Factor[4]
1	Squaw Valley Road between SR 89 and Squaw Creek Road	1167	12600	10.80	1316	15400	11.70
2	Squaw Valley Road between Squaw Creek Road and village area	810	12900	15.93	880	15300	17.39

#	Segment	Summer Existing Pk Vol[3]	Summer Existing ADT	Summer Existing K-Factor[4]	Summer Existing + Project Pk Vol[3]	Summer Existing + Project ADT	Summer Existing + Project K-Factor[4]
1	Squaw Valley Road between SR 89 and Squaw Creek Road	477	5150	10.80	1239	14499	11.70
2	Squaw Valley Road between Squaw Creek Road and village area	384	6116	15.93	719	12501	17.39

Notes

1. Existing ADT and Existing + Project ADT was available in the traffic report for the winter condition and for segments of SR 89 for summer conditions
2. ADT Data for the summer conditions for segments on Squaw Valley Rd were calculated based on K-factors for these segments derived from the winter condition data
3. Peak hour data was available in the traffic report for all study intersections. Peak volumes were summed and averaged for segments containing multiple intersections
4. The k-factor represents the ratio of ADT to Peak Traffic Volumes. K-factors were derived based on provided peak data and adt for winter conditions and applied to summer conditions
5. ADT values were calculated using the derived K-Factor and applied to segments on Squaw Valley Road where ADT was not

Traffic Noise Model Inputs-Cumulative

#	Study Road Segments	Winter: Cumu No Pro ADT[1]	Winter: Cumu + Pro ADT[1]	Summer: Cumul No Pro ADT[1,2]	Summer: Cumul + Pro ADT[1,2]
1	Squaw Valley Road between SR 89 and Squaw Creek Road	15500	18300	6442	17229
2	Squaw Valley Road between Squaw Creek Road and village area	14600	17000	7596	13890
~~3~~	SR 89 north of Squaw Valley Road	27000	29983	30060	36649
~~4~~	SR 89 south of Squaw Valley Road	24660	35355	36000	44457

11	10	9	8	7	6	
670	1190	1240	5	390	300	
100	40	10	780	400	80	
2	20	10	480	15	15	
100	170	20	1	60	15	
580		5	5	80	10	
1		200	20	20	70	
1453	1420	1485	1	965	490	5853
			130			1170.6
2873			1			
1437			70			
			1493			

K-Factor Calc

#	Segment	Winter Cumulative: Pk Vol[3]	ADT	K-Factor[4]	Winter Cumulative + Project: Pk Vol[3]	ADT	K-Factor[4]
1	Squaw Valley Road between SR 89 and Squaw Creek Road	1437	15500	10.79	1316	18300	13.91
2	Squaw Valley Road between Squaw Creek Road and village area	1171	14600	12.47	880	17000	19.32
3	SR 89 north of Squaw Valley Road	1430	27000	18.88	1588	29983	18.88
4	SR 89 south of Squaw Valley Road	1395	24660	17.68	2000	35355	17.68

#	Segment	Summer Cumulative: Pk Vol[3]	ADT	K-Factor[4]	Summer Cumulative + Project: Pk Vol[3]	ADT	K-Factor[4]
1	Squaw Valley Road between SR 89 and Squaw Creek Road	597	6442	10.79	1239	17229	13.91
2	Squaw Valley Road between Squaw Creek Road and village area	609	7596	12.47	719	13890	19.32
	SR 89 north of Squaw Valley Road	1615	30060	18.61	1969	36649	18.61
	SR 89 south of Squaw Valley Road	1592	36000	22.61	1966	44457	22.61

Notes

1. Existing ADT and Existing + Project ADT was available in the traffic report for the winter condition and for segments of SR 89 for summer conditions
2. ADT Data for the summer conditions for segments on Squaw Valley Rd were calculated based on K-factors for these segments derived from the winter condition data
3. Peak hour data was available in the traffic report for all study intersections. Peak volumes were summed and averaged for segments containing multiple intersections
4. The k-factor represents the ratio of ADT to Peak Traffic Volumes. K-factors were derived based on provided peak data
5. ADT values were calculated using the derived K-Factor and applied to segments on Squaw Valley Road where ADT was
6. 20% growth was applied to SR 89 segments based on cumulative traffic study

Traffic Inputs for Alternatives Traffic Noise Analysis

reductions are taken for each alternative based on the traffic number reductions in comparison to the project as described in Chapter 18 Alternative. Traffic volumes were generated based on these reductions which were then used in the traffic noise model for each alternative.

No Project- SVGPLUO Development Alternative Winter- reduce 30%, Summer- Reduce 42%		Winter					Summer				
		Exist	Exist +	Change	Reduction	Alt ADT	Exist	Exist +	Change	Reduction	Alt ADT
Squaw Valey Road	SR 89 and squaw creek rd	12600	15400	2800	1960	14560	5150	14499	9349	5422.42	10572.42
Squaw Valey Road	squaw creek rd and village	12900	15300	2400	1680	14580	6116	12501	6385	3703.3	9819.3
SR 89	north of Squaw Valley Road	15000	16500	1500	1050	16050	16700	21600	4900	2842	19542
SR 89	South of Squaw Valley Road	13700	15000	1300	910	14610	16500	20000	3500	2030	18530

Reduced Density		Winter					Summer				
Summer and Winter- reduce 51%		Exist	Exist +	Change	Reduction	Alt ADT	Exist	Exist +	Change	Reduction	Alt ADT
Squaw Valey Road	SR 89 and squaw creek rd	12600	15400	2800	1372	13972	5150	14499	9349	4581.01	9731.01
Squaw Valey Road	squaw creek rd and village	12900	15300	2400	1176	14076	6116	12501	6385	3128.65	9244.65
SR 89	north of Squaw Valley Road	15000	16500	1500	735	15735	16700	21600	4900	2401	19101
SR 89	South of Squaw Valley Road	13700	15000	1300	637	14337	16500	20000	3500	1715	18215

Historical Preservation Alternative Winter-		Winter					Summer				
reduce 11%, Summer- Reduce 17%		Exist	Exist +	Change	Reduction	Alt ADT	Exist	Exist +	Change	Reduction	Alt ADT
Squaw Valey Road	SR 89 and squaw creek rd	12600	15400	2800	2492	15092	5150	14499	9349	7759.67	12909.67
Squaw Valey Road	squaw creek rd and village	12900	15300	2400	2136	15036	6116	12501	6385	5299.55	11415.55
SR 89	north of Squaw Valley Road	15000	16500	1500	1335	16335	16700	21600	4900	4067	20767
SR 89	South of Squaw Valley Road	13700	15000	1300	1157	14857	16500	20000	3500	2905	19405

	Day	Time	Duration	Location	Distance to POI	Leq	Lmax	Lmin	L10	L50	L90	Major Noise Sources
1	3/30/2012	9:42 AM	15 min	Funitel Lift	18 yrds to bldg	69.2	74/80.8	66.6	70.6	68.7	67.6	Funitel lift is primary noise source with an Lmax of 74 @ 18 yrds. Person dropped snow snowboard about 15 feet away with an Lmax of 80.8. Other sources include people talking nearby noise meter.
2	3/30/2012	11:42 AM	15 min	Squaw Entrance	31 yrds to sign	61.3	65	48.9	63.3	55.7	51.5	Primary noise sources include mobile sources from delivery trucks (e.g., fed ex, restaurant supplies) unloading, closing doors, and brakes, and passanger vehicles entering the parking lot and Squaw Village. Other sources include people talking. Max occured 13 times and can be attributed to vehicle drive by at approximately 15 ft from meter.
3	3/30/2012	3:29 PM	15 min	Far East Express	18 yrds from lift	69.6	73.5	66.8	71	69.3	67.8	Primary noise source is far east express lift with an Lmax of 73.5 @ 18 yrds. Other noise sources include typical parking lot noises such as people walking/talking around cars, car doors opening and closing, cars driving by, and engines turning on.
4	3/30/2012	4:00 PM	15 min	Residential Area	119 yrds from CL of	53.4	63.7	44.5	56.5	51	48.3	Primary: Traffic from Squaw Creek Road, Christy Ln, and Christy Hill Rd. Other noise sources: people talking
5	3/30/2012	4:30 PM	15 mi	Christy Hill/Squaw	11 yrds from CL	67.9	80.1	49.6	71.5	66.2	59.2	Traffic Count Data on Squaw Creek Road: Peak Hour Friday Afternoon 4:30-5:30 PM. Leaving Squaw-828 passanger, 8 Busses. Entering Squaw 232 passanger, 4 Buses.
2	3/30/2012	10:30 PM	15 min	Squaw Entrance	31 yrds to sign	53.9	72.3	45.2	55.7	49.4	46.7	Primary Noise: Cars driving by. Other noise sources- people talking/yelling. Groomers on the slopes in the background
6	4/1/2012	9:00 AM	15 min	Red Dog	44 yrds	63.7	75.8	61.9	64.2	63.4	62.7	Primary Noise- Red Dog Building. Other noise sources-cars/shuttles driving by and avalanch blasting in the background. Max-shuttle drive by meter
	4/1/2012	9:00 AM	15 min	Red Dog BLD	19 yrds	71.3	71.3	71.3				Snowmaking building
7	4/1/2012	10:30 AM	15 min	Olympic Village Inn	67 yrds	59.8	78.1	40.5	61.6	50.3	43.4	Primary Noise: Typical parking lot sounds (doors slamming, car alarms, engines starting).
8	4/1/2012	11:45 AM	15 min	East Parking Lot	71 yrds Squaw Village Entrance	54.6	73	44.8	57.5	50	46.6	Primary Noise: Typical parking lot sounds (doors slamming, car alarms, engines starting). Background noise from race announcer and music at the Village. Max-car door slamming 15' away
9	4/1/2012	2:00 PM	15 min	Residence near Squaw Resort	107 yrds from residence on bridge	57.9	72.7	39.9	62.1	47.3	42.4	Traffic County Data at Squaw Creek Resort: 2PM Sunday. 92 passanger, 12 Shutt;e bus Noise Sources: Primary-mobile, other environmental- birds, wind
5	4/1/2012	2:30 PM	15 min	Christy Hill/Squaw	11 yrds from CL	65.5	78.8	46.1	68.6	62.7	56.6	Traffic Count Data on Squaw Creek Road: Peak Hour Sunday Afternoon 2:30-3:30 PM. Leaving Squaw- 720 passanger, 12 Busses. Entering Squaw 380 passanger, 16 Busses.
10	4/1/2012	5:00 PM	15 min	Inside Squaw Village	Lunch table in front	67.8	80.6	61.5	70.2	66.2	63.9	End of high activity ski day on Sunday afternoon. Many people in village eating, walking, kids playing/yelling. Max-kids screaminf 12 yrds away.
4	4/1/2012	8:00 PM	15 min	Residential Area	119 yrds from CL of	46.5	60	37.1	49.3	41.8	35.6	Primary: Traffic from Squaw Creek Road, Christy Ln, and Christy Hill Rd. Other noise sources: people talking. Max-SUV driving by
11	4/2/2012	9:30 AM	15 min	Residential Area 410	Adjacent to	53.4	71.3	42.3	53.9	45.5	43.5	Primary noise: cars driving by. Max- SUV drive by.

2013	Day	Time	Duration	Location	Distance to POI	Leq	Lmax	Lmin	L10	L50	L90	Major Noise Sources
12	4/11/2013	10:56 PM	10 min	Squaw-South Side	1000 feet to snow cat	48.3	58.4	40.6	51.5	46	43	Primary noise source was snow cat working on the slopes 1000 feet away. Max was from beeping.
13	4/12/2013	10:00 AM	5 min	red dog parking lot	72 feet from	82.4	91.5	65.1	87	78.7	70.3	Primary noise source was dozer running and dozer scraping. Max occurred from scraper @ 27 feet from SLM. The dozer came as close as 27 and went as far as 144 feete. Therefore distance to acoustical center was approx 72 f feet
	4/12/2013	10:05 AM	5 min	red dog parking lot	45 feet from	82	93	65.1	85.9	77.8	69.3	Primary noise source was snow plower with augers running. Max occurred from plow @ 18 feet from SLM. The dozer came as close as 18 feets and went as far as 30 yards. Therefore distance to acoustical center was approx 45 ft
14	4/12/2013	11:10 AM	15 min	Squaw Village Lodge-Faceing South		55.5	64.2	53.7	56.2	55.2	54.5	south facing-primary noise from lift. Other noise sources included running water from nearby house, people walking and talking. XX feet north of squaw lodge
15	4/12/2013	11:52 AM	15 min	Red Wolf Lodge	29 feet north of building	53	62.6	51.2	53.8	52.3	51.9	next to wooden walking path and small storage shed. Primary noise from people walking by in skis.
16	4/12/2013	1:45 PM	15 min	Nearest residence	105 feet from	59.5	71.5	39.2	64.3	52.8	43.5	primary noise from traffic on squaw village road.
17	4/12/2013	2:26 PM	15 min	Lot 4	XX feet from	44.3	63	40.7	45	43	41.5	traffic noise in background from squaw village road and frogs
18	4/12/2013	3:03 PM	15 min	olympic village courtyard		42.1	55.8	38.1	43.8	40.4	39.2	generally very quiet. A few cars pass by resulted in the max. A few people talking

Equipment Measurements

		Lmax	Reference Distance
1	Funitel	71.7	14 yards
2	Far East Express Lift	73.5	18 yards
3	Red Dog	71.3	19 yards

Notes: Matching colored cells indicate measurements taken at the same location but different times of the day

Date	Time	Duration	Leq		Lmax	Lmin
12-Apr 2013	9:00:00	2066	59.8	60	83.1	42.3
12-Apr 2013	10:00:00	3600	61.8	62	85	50.5
12-Apr 2013	11:00:00	3600	65	65	89.7	42.3
12-Apr 2013	12:00:00	3600	57.5	58	84.5	42.4
12-Apr 2013	13:00:00	3600	53	53	71	42.3
12-Apr 2013	14:00:00	3600	63.4	63	85.4	43.5
12-Apr 2013	15:00:00	3600	57	57	75	45
12-Apr 2013	16:00:00	3600	55.5	56	69.8	44.7
12-Apr 2013	17:00:00	3600	52.9	53	73.7	45.1
12-Apr 2013	18:00:00	3600	52.5	53	70.9	42.1
12-Apr 2013	19:00:00	3600	51.4	51	80.7	41.7
12-Apr 2013	20:00:00	3600	47.8	48	70.7	40.4
12-Apr 2013	21:00:00	3600	53.2	53	73.1	41.4
12-Apr 2013	22:00:00	3600	46.4	46	62.1	41.5
12-Apr 2013	23:00:00	3600	45.3	45	63.8	41.1
13-Apr 2013	0:00:00	3600	48.4	48	73.9	40.6
13-Apr 2013	1:00:00	3600	43.9	44	57.4	41.1
13-Apr 2013	2:00:00	3600	44.3	44	64.1	40.3
13-Apr 2013	3:00:00	3600	42.3	42	51.6	40.3
13-Apr 2013	4:00:00	3600	46.6	47	64.4	41.3
13-Apr 2013	5:00:00	902.2	47.6	48	59.3	44.3
	6:00:00			49	74	42
	7:00:00			55	74	42
	8:00:00			58	85	44

Long-Term Noise Measurement Summary

KEY: Orange cells are for input.
Grey cells are intermediate calculations performed by the model.
Green cells are data to present in a written analysis (output).

Measurement Site: In Squaw Village Near Site of Proposed Amphitheer
Measurement Date: 4/12/2013
Project Name: Squaw Village

Computation of CNEL

Hour of Day (military time)	Sound Level Leq (dBA)	Sound Power =10*Log(dBA/10)	Period of 24-Hour Day (1=included, 0=not) Day	Evening	Night	Sound Power Breakdown by Period of Day Day	Evening	Night
0:00	48.4	69,183	0	0	1	0	0	69,183
1:00	43.9	24,547	0	0	1	0	0	24,547
2:00	44.3	26,915	0	0	1	0	0	26,915
3:00	42.3	16,982	0	0	1	0	0	16,982
4:00	46.6	45,709	0	0	1	0	0	45,709
5:00	47.6	57,544	0	0	1	0	0	57,544
6:00	49.0	79,433	0	0	1	0	0	79,433
7:00	55.0	316,228	1	0	0	316,228	0	0
8:00	58.0	630,957	1	0	0	630,957	0	0
9:00	59.8	954,993	1	0	0	954,993	0	0
10:00	61.8	1,513,561	1	0	0	1,513,561	0	0
11:00	65.0	3,162,278	1	0	0	3,162,278	0	0
12:00	57.5	562,341	1	0	0	562,341	0	0
13:00	53.0	199,526	1	0	0	199,526	0	0
14:00	63.4	2,187,762	1	0	0	2,187,762	0	0
15:00	57.0	501,187	1	0	0	501,187	0	0
16:00	55.5	354,813	1	0	0	354,813	0	0
17:00	52.9	194,984	1	0	0	194,984	0	0
18:00	52.5	177,828	1	0	0	177,828	0	0
19:00	51.4	138,038	0	1	0	0	138,038	0
20:00	47.8	60,256	0	1	0	0	60,256	0
21:00	53.2	208,930	0	1	0	0	208,930	0
22:00	46.4	43,652	0	0	1	0	0	43,652
23:00	45.3	33,884	0	0	1	0	0	33,884

	Day	Evening	Night
Sum of Sound Power during Period wo/penalty	10,756,459	407,224	397,850
Log Factor for CNEL Penalty (i.e., 10*log(x))	1	3	10
Sound Power during Period with penalty	10,756,459	1,221,672	3,978,496

Total Daily Sound Power, with penalties	15,956,627
Hours per Day	24
Average Hourly Sound Power, with penalties	664,859
CNEL	58.2

Ldn computation on next page.

Computation of Ldn

Period of 24-Hour Day (1=included, 0=not)		Sound Power Breakdown by Period of Day	
Day	Night	Day	Night
0	1	0	69,183
0	1	0	24,547
0	1	0	26,915
0	1	0	16,982
0	1	0	45,709
0	1	0	57,544
0	1	0	79,433
1	0	316,228	0
1	0	630,957	0
1	0	954,993	0
1	0	1,513,561	0
1	0	3,162,278	0
1	0	562,341	0
1	0	199,526	0
1	0	2,187,762	0
1	0	501,187	0
1	0	354,813	0
1	0	194,984	0
1	0	177,828	0
1	0	138,038	0
1	0	60,256	0
1	0	208,930	0
0	1	0	43,652
0	1	0	33,884

	Day	Night
Sum of Sound Power during Period wo/penalty	11,163,683	397,850
Log Factor for Penalty (i.e., 10*log(x))	1	10
Sound Power during Period with penalty	11,163,683	3,978,496

Total Daily Sound Power, with penalties	15,142,179
Hours per Day	24
Average Hourly Sound Power, with penalties	630,924
Ldn	58.0

Notes:

Computation of the CNEL based on 1-hour Leq measurements for each hour of a day are based on equation 2-27 on pg. 2-57 of Caltrans 2009.

Computation of the Ldn based on 1-hour Leq measurements for each hour of a day are based on equation 2-26 on pg. 2-56 of Caltrans 2009.

Log factors for the Ldn and CNEL penalties are provided in Table 2-12 on pg. 2-52 of Caltrans 2009.

Source:

California Deaprtment of Transportation (Caltrans), Divisiong of Environmental Analysis. 2009 (November). *2009 Technical Noise Supplement* . Sacramento, CA. Available: <http://www.dot.ca.gov/hq/env/noise/>. Accessed September 24, 2010.