

Appendix H

Noise Measurement Data

Traffic Noise Spreadsheet Calculator



Project: P Street Office Building

Noise Level Descriptor: CNEL
 Site Conditions: Hard
 Traffic Input: Peak
 Traffic K-Factor: 9.76

				Input										Output				
Segment Description and Location				Peak Hour Volume	Speed (mph)	Distance to Directional Centerline, (feet) ₄		Traffic Distribution Characteristics					CNEL, (dBA) _{5,6,7}	Distance to Contour, (feet) ₃				
Number	Name	From	To			Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve		% Night	70 dBA	65 dBA	60 dBA	55 dBA
Existing Conditions																		
1	N Street	5th Street	7th Street	676	25	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	59.7	5	15	47	149
2	N Street	7th Street	8th Street	766	25	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	60.3	5	17	53	169
3	N Street	8th Street	9th Street	606	25	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	59.3	4	13	42	134
4	N Street	9th Street	10th Street	766	25	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	60.3	5	17	53	169
5	7th Street	N Street	O Street	778	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	62.0	8	25	79	250
6	7th Street	O Street	Opera Alley	760	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	61.9	8	24	77	245
7	7th Street	Opera Alley	P Street	838	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	62.3	9	27	85	270
8	7th Street	P Street	Q Street	701	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	61.5	7	23	71	226
9	8th Street	N Street	O Street	369	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	58.8	4	12	38	119
10	8th Street	O Street	Opera Alley	384	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	58.9	4	12	39	124
11	8th Street	Opera Alley	P Street	415	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	59.3	4	13	42	134
12	8th Street	P Street	Q Street	453	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	59.6	5	15	46	146
13	O Street	7th Street	8th Street	26	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	47.2		1	3	8
14	P Street	3rd Street	7th Street	1,973	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	66.0	20	64	201	635
15	P Street	7th Street	8th Street	1,222	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	64.0	12	39	124	393
16	P Street	8th Street	9th Street	1,184	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	63.8	12	38	121	381
17	Q Street	3rd Street	7th Street	1,632	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	65.2	17	53	166	525
18	Q Street	7th Street	8th Street	1,563	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	65.0	16	50	159	503
19	Q Street	8th Street	9th Street	1,396	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	64.5	14	45	142	449
20	Q Street	9th Street	10th Street	1,397	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	64.5	14	45	142	450
21	15th Street	N Street	W Street	1,660	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	65.3	17	53	169	534
22	16th Street	N Street	W Street	1,310	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	64.3	13	42	133	422
23	9th Street	N Street	P Street	1,043	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	63.3	11	34	106	336
24	9th Street	P Street	Q Street	1,072	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	63.4	11	35	109	345
25	9th Street	Q Street	R Street	1,207	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	63.9	12	39	123	389

*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: P Street Office Building

Noise Level Descriptor: CNEL
 Site Conditions: Hard
 Traffic Input: Peak
 Traffic K-Factor: 9.76

Segment Description and Location				Input										Output						
Number	Name	From	To	Peak Hour Volume	Speed (mph)	Distance to Directional Centerline, (feet) ₄		Traffic Distribution Characteristics					CNEL, (dBA) _{5,6,7}	Distance to Contour, (feet) ₃						
						Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve		% Night	70 dBA	65 dBA	60 dBA	55 dBA		
Existing Conditions																				
1	N Street	5th Street	7th Street	669	25	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	59.7	5	15	47	148		
2	N Street	7th Street	8th Street	543	25	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	58.8	4	12	38	120		
3	N Street	8th Street	9th Street	520	25	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	58.6	4	11	36	115		
4	N Street	9th Street	10th Street	679	25	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	59.8	5	15	47	150		
5	7th Street	N Street	O Street	789	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	62.1	8	25	80	254		
6	7th Street	O Street	Opera Alley	790	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	62.1	8	25	80	254		
7	7th Street	Opera Alley	P Street	809	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	62.2	8	26	82	260		
8	7th Street	P Street	Q Street	689	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	61.5	7	22	70	222		
9	8th Street	N Street	O Street	407	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	59.2	4	13	41	131		
10	8th Street	O Street	Opera Alley	382	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	58.9	4	12	39	123		
11	8th Street	Opera Alley	P Street	382	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	58.9	4	12	39	123		
12	8th Street	P Street	Q Street	432	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	59.4	4	14	44	139		
13	O Street	7th Street	8th Street	26	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	47.2		1	3	8		
14	P Street	3rd Street	7th Street	2,010	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	66.1	20	65	205	647		
15	P Street	7th Street	8th Street	1,276	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	64.1	13	41	130	411		
16	P Street	8th Street	9th Street	1,226	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	64.0	12	39	125	395		
17	Q Street	3rd Street	7th Street	1,717	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	65.4	17	55	175	553		
18	Q Street	7th Street	8th Street	1,620	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	65.2	16	52	165	522		
19	Q Street	8th Street	9th Street	1,490	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	64.8	15	48	152	480		
20	Q Street	9th Street	10th Street	1,486	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	64.8	15	48	151	478		
21	15th Street	N Street	W Street	1,721	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	65.4	18	55	175	554		
22	16th Street	N Street	W Street	1,622	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	65.2	17	52	165	522		
23	9th Street	N Street	P Street	1,024	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	63.2	10	33	104	330		
24	9th Street	P Street	Q Street	1,087	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	63.5	11	35	111	350		
25	9th Street	Q Street	R Street	1,250	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	64.1	13	40	127	402		

*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: P Street Office Building

Noise Level Descriptor: Leq
 Site Conditions: Hard
 Traffic Input: Peak
 Traffic K-Factor: 9.76

Segment Description and Location				Input										Output						
Number	Name	From	To	Peak Hour Volume	Speed (mph)	Distance to Directional Centerline, (feet) ₄		Traffic Distribution Characteristics					Leq, (dBA) _{5,6,7}	Distance to Contour, (feet) ₃						
						Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve		% Night	70 dBA	65 dBA	60 dBA	55 dBA		
Existing Conditions																				
1	N Street	5th Street	7th Street	669	25	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	61.0	6	20	62	198		
2	N Street	7th Street	8th Street	543	25	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	60.1	5	16	51	160		
3	N Street	8th Street	9th Street	520	25	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	59.9	5	15	49	154		
4	N Street	9th Street	10th Street	679	25	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	61.0	6	20	63	200		
5	7th Street	N Street	O Street	789	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	63.3	11	34	108	340		
6	7th Street	O Street	Opera Alley	790	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	63.3	11	34	108	340		
7	7th Street	Opera Alley	P Street	809	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	63.4	11	35	110	349		
8	7th Street	P Street	Q Street	689	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	62.7	9	30	94	297		
9	8th Street	N Street	O Street	407	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	60.4	6	18	55	175		
10	8th Street	O Street	Opera Alley	382	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	60.2	5	16	52	165		
11	8th Street	Opera Alley	P Street	382	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	60.2	5	16	52	165		
12	8th Street	P Street	Q Street	432	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	60.7	6	19	59	186		
13	O Street	7th Street	8th Street	26	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	48.5		1	4	11		
14	P Street	3rd Street	7th Street	2,010	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	67.4	27	87	274	866		
15	P Street	7th Street	8th Street	1,276	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	65.4	17	55	174	550		
16	P Street	8th Street	9th Street	1,226	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	65.2	17	53	167	528		
17	Q Street	3rd Street	7th Street	1,717	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	66.7	23	74	234	740		
18	Q Street	7th Street	8th Street	1,620	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	66.4	22	70	221	698		
19	Q Street	8th Street	9th Street	1,490	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	66.1	20	64	203	642		
20	Q Street	9th Street	10th Street	1,486	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	66.1	20	64	202	640		
21	15th Street	N Street	W Street	1,721	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	66.7	23	74	235	742		
22	16th Street	N Street	W Street	1,622	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	66.5	22	70	221	699		
23	9th Street	N Street	P Street	1,024	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	64.5	14	44	140	441		
24	9th Street	P Street	Q Street	1,087	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	64.7	15	47	148	468		
25	9th Street	Q Street	R Street	1,250	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	65.3	17	54	170	539		

*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: P Street Office Building

Noise Level Descriptor: CNEL
 Site Conditions: Hard
 Traffic Input: Peak
 Traffic K-Factor: 9.76

Segment Description and Location				Input										Output					
Number	Name	From	To	Peak Hour Volume	Speed (mph)	Distance to Directional Centerline, (feet) ₄		Traffic Distribution Characteristics					CNEL, (dBA) _{5,6,7}	Distance to Contour, (feet) ₃					
						Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve		% Night	70 dBA	65 dBA	60 dBA	55 dBA	
Existing Conditions																			
1	N Street	5th Street	7th Street	520	25	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	58.6	4	11	36	115	
2	N Street	7th Street	8th Street	550	25	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	58.8	4	12	38	121	
3	N Street	8th Street	9th Street	440	25	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	57.9	3	10	31	97	
4	N Street	9th Street	10th Street	560	25	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	58.9	4	12	39	124	
5	7th Street	N Street	O Street	1,120	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	63.6	11	36	114	361	
6	7th Street	O Street	Opera Alley	1,060	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	63.3	11	34	108	341	
7	7th Street	Opera Alley	P Street	1,130	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	63.6	12	36	115	364	
8	7th Street	P Street	Q Street	910	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	62.7	9	29	93	293	
9	8th Street	N Street	O Street	900	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	62.6	9	29	92	290	
10	8th Street	O Street	Opera Alley	910	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	62.7	9	29	93	293	
11	8th Street	Opera Alley	P Street	940	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	62.8	10	30	96	303	
12	8th Street	P Street	Q Street	560	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	60.6	6	18	57	180	
13	O Street	7th Street	8th Street	220	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	56.5	2	7	22	71	
14	P Street	3rd Street	7th Street	2,320	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	66.7	24	75	236	747	
15	P Street	7th Street	8th Street	1,350	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	64.4	14	43	137	435	
16	P Street	8th Street	9th Street	1,750	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	65.5	18	56	178	563	
17	Q Street	3rd Street	7th Street	2,250	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	66.6	23	72	229	724	
18	Q Street	7th Street	8th Street	2,370	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	66.8	24	76	241	763	
19	Q Street	8th Street	9th Street	1,990	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	66.1	20	64	203	641	
20	Q Street	9th Street	10th Street	1,850	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	65.8	19	60	188	596	
21	15th Street	N Street	W Street	1,970	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	66.0	20	63	201	634	
22	16th Street	N Street	W Street	1,560	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	65.0	16	50	159	502	
23	9th Street	N Street	P Street	1,470	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	64.8	15	47	150	473	
24	9th Street	P Street	Q Street	1,410	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	64.6	14	45	144	454	
25	9th Street	Q Street	R Street	1,680	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	65.3	17	54	171	541	

*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: P Street Office Building

Noise Level Descriptor: CNEL
 Site Conditions: Hard
 Traffic Input: Peak
 Traffic K-Factor: 9.76

Segment Description and Location				Input										Output						
Number	Name	From	To	Peak Hour Volume	Speed (mph)	Distance to Directional Centerline, (feet) ₄		Traffic Distribution Characteristics					CNEL, (dBA) _{5,6,7}	Distance to Contour, (feet) ₃						
						Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve		% Night	70 dBA	65 dBA	60 dBA	55 dBA		
Existing Conditions																				
1	N Street	5th Street	7th Street	430	25	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	57.8	3	9	30	95		
2	N Street	7th Street	8th Street	500	25	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	58.4	3	11	35	110		
3	N Street	8th Street	9th Street	400	25	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	57.5	3	9	28	88		
4	N Street	9th Street	10th Street	480	25	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	58.3	3	11	33	106		
5	7th Street	N Street	O Street	1,150	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	63.7	12	37	117	370		
6	7th Street	O Street	Opera Alley	1,080	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	63.4	11	35	110	348		
7	7th Street	Opera Alley	P Street	1,110	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	63.5	11	36	113	357		
8	7th Street	P Street	Q Street	1,020	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	63.2	10	33	104	328		
9	8th Street	N Street	O Street	820	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	62.2	8	26	83	264		
10	8th Street	O Street	Opera Alley	740	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	61.8	8	24	75	238		
11	8th Street	Opera Alley	P Street	740	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	61.8	8	24	75	238		
12	8th Street	P Street	Q Street	470	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	59.8	5	15	48	151		
13	O Street	7th Street	8th Street	240	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	56.9	2	8	24	77		
14	P Street	3rd Street	7th Street	2,350	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	66.8	24	76	239	757		
15	P Street	7th Street	8th Street	1,350	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	64.4	14	43	137	435		
16	P Street	8th Street	9th Street	1,670	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	65.3	17	54	170	538		
17	Q Street	3rd Street	7th Street	2,260	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	66.6	23	73	230	728		
18	Q Street	7th Street	8th Street	2,220	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	66.6	23	71	226	715		
19	Q Street	8th Street	9th Street	1,930	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	65.9	20	62	196	621		
20	Q Street	9th Street	10th Street	1,850	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	65.8	19	60	188	596		
21	15th Street	N Street	W Street	1,970	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	66.0	20	63	201	634		
22	16th Street	N Street	W Street	1,630	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	65.2	17	52	166	525		
23	9th Street	N Street	P Street	1,420	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	64.6	14	46	145	457		
24	9th Street	P Street	Q Street	1,350	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	64.4	14	43	137	435		
25	9th Street	Q Street	R Street	1,660	30	50	50	97.0%	2.0%	1.0%	80.0%	15.0%	5.0%	65.3	17	53	169	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.

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: P Street Office Building (Location 1 - Heilbron House)

Measurement Date: 2/14/2017

Project Name: Resource Building Replacement

Computation of CNEL

Hour of Day (military time)	Sound Level Leq (dBA)	Sound Power =10*Log(dBA/1 0)	Period of 24-Hour Day (1=included, 0=not)			Sound Power Breakdown by Period of Day		
			Day	Evening	Night	Day	Evening	Night
0:00	52.9	196,024	0	0	1	0	0	196,024
1:00	53.0	199,717	0	0	1	0	0	199,717
2:00	52.8	192,723	0	0	1	0	0	192,723
3:00	56.1	406,926	0	0	1	0	0	406,926
4:00	59.1	808,189	0	0	1	0	0	808,189
5:00	59.7	939,410	0	0	1	0	0	939,410
6:00	60.7	1,188,335	0	0	1	0	0	1,188,335
7:00	61.6	1,452,232	1	0	0	1,452,232	0	0
8:00	61.3	1,339,439	1	0	0	1,339,439	0	0
9:00	61.2	1,313,095	1	0	0	1,313,095	0	0
10:00	60.5	1,124,198	1	0	0	1,124,198	0	0
11:00	59.1	816,658	1	0	0	816,658	0	0
12:00	59.1	820,962	1	0	0	820,962	0	0
13:00	60.3	1,070,580	1	0	0	1,070,580	0	0
14:00	61.5	1,419,342	1	0	0	1,419,342	0	0
15:00	62.2	1,655,808	1	0	0	1,655,808	0	0
16:00	65.0	3,159,010	1	0	0	3,159,010	0	0
17:00	61.1	1,291,014	1	0	0	1,291,014	0	0
18:00	58.9	776,244	1	0	0	776,244	0	0
19:00	57.8	599,106	0	1	0	0	599,106	0
20:00	58.0	632,748	0	1	0	0	632,748	0
21:00	57.6	570,842	0	1	0	0	570,842	0
22:00	55.7	369,375	0	0	1	0	0	369,375
23:00	52.2	164,342	0	0	1	0	0	164,342
Avg Leq	58.6							
Daytime Leq	60.3							
Nighttime Leq	55.8							

Sum of Sound Power during Period wo/penalty	16,238,581	1,802,697	4,465,041
Log Factor for CNEL Penalty (i.e., 10*log(x))	1	3	10
Sound Power during Period with penalty	16,238,581	5,408,091	44,650,405

Total Daily Sound Power, with penalties	66,297,077
Hours per Day	24
Average Hourly Sound Power, with penalties	2,762,378
CNEL	64.4

Ldn computation on next page.

Computation of Ldn

Day	Night	Sound Power Breakdown by Period of Day	
		Day	Night
0	1	0	196,024
0	1	0	199,717
0	1	0	192,723
0	1	0	406,926
0	1	0	808,189
0	1	0	939,410
0	1	0	1,188,335
1	0	1,452,232	0
1	0	1,339,439	0
1	0	1,313,095	0
1	0	1,124,198	0
1	0	816,658	0
1	0	820,962	0
1	0	1,070,580	0
1	0	1,419,342	0
1	0	1,655,808	0
1	0	3,159,010	0
1	0	1,291,014	0
1	0	776,244	0
1	0	599,106	0
1	0	632,748	0
1	0	570,842	0
0	1	0	369,375
0	1	0	164,342

Sum of Sound Power during Period wo/penalty	18,041,278	4,465,041
Log Factor for Penalty (i.e., 10*log(x))	1	10
Sound Power during Period with penalty	18,041,278	44,650,405

Total Daily Sound Power, with penalties	62,691,683
Hours per Day	24
Average Hourly Sound Power, with penalties	2,612,153
Ldn	64.2

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

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: P Street Office Building (Location 2 - Capitol Towers)
Measurement Date: 2/14/2017
Project Name: Resource Building Replacement

Computation of CNEL

Hour of Day (military time)	Sound Level Leq (dBA)	Sound Power =10*Log(dB A/10)	Period of 24-Hour Day (1=included, 0=not)			Sound Power Breakdown by Period of Day			
			Day	Evening	Night	Day	Evening	Night	
			0:00	53.9	245,471	0	0	1	0
1:00	51.9	154,882	0	0	1	0	0	154,882	
2:00	52.3	169,824	0	0	1	0	0	169,824	
3:00	54.2	263,027	0	0	1	0	0	263,027	
4:00	59.1	812,831	0	0	1	0	0	812,831	
5:00	63.6	2,290,868	0	0	1	0	0	2,290,868	
6:00	63.7	2,344,229	0	0	1	0	0	2,344,229	
7:00	62.5	1,778,279	1	0	0	1,778,279	0	0	
8:00	63.9	2,454,709	1	0	0	2,454,709	0	0	
9:00	62.6	1,819,701	1	0	0	1,819,701	0	0	
10:00	60.8	1,202,264	1	0	0	1,202,264	0	0	
11:00	60.0	1,000,000	1	0	0	1,000,000	0	0	
12:00	61.0	1,258,925	1	0	0	1,258,925	0	0	
13:00	60.1	1,023,293	1	0	0	1,023,293	0	0	
14:00	62.1	1,621,810	1	0	0	1,621,810	0	0	
15:00	62.4	1,737,801	1	0	0	1,737,801	0	0	
16:00	62.8	1,905,461	1	0	0	1,905,461	0	0	
17:00	64.7	2,951,209	1	0	0	2,951,209	0	0	
18:00	61.8	1,513,561	1	0	0	1,513,561	0	0	
19:00	60.2	1,047,129	0	1	0	0	1,047,129	0	
20:00	61.7	1,479,108	0	1	0	0	1,479,108	0	
21:00	59.8	954,993	0	1	0	0	954,993	0	
22:00	59.3	851,138	0	0	1	0	0	851,138	
23:00	55.4	346,737	0	0	1	0	0	346,737	
Avg Leq	60.0								
Daytime Le	61.8								
Nighttime l	57.0								

Sum of Sound Power during Period wo/penalty	20,267,014	3,481,230	7,479,006
Log Factor for CNEL Penalty (i.e., 10*log(x))	1	3	10
Sound Power during Period with penalty	20,267,014	10,443,689	74,790,056

Total Daily Sound Power, with penalties	105,500,759
Hours per Day	24
Average Hourly Sound Power, with penalties	4,395,865
CNEL	66.4

Ldn computation on next page.

Computation of Ldn

Period of 24-Hour Sound Power Breakdown Day (1=included, 0=not)		by Period of Day	
Day	Night	Day	Night
0	1	0	245,471
0	1	0	154,882
0	1	0	169,824
0	1	0	263,027
0	1	0	812,831
0	1	0	2,290,868
0	1	0	2,344,229
1	0	1,778,279	0
1	0	2,454,709	0
1	0	1,819,701	0
1	0	1,202,264	0
1	0	1,000,000	0
1	0	1,258,925	0
1	0	1,023,293	0
1	0	1,621,810	0
1	0	1,737,801	0
1	0	1,905,461	0
1	0	2,951,209	0
1	0	1,513,561	0
1	0	1,047,129	0
1	0	1,479,108	0
1	0	954,993	0
0	1	0	851,138
0	1	0	346,737

Sum of Sound Power during Period wo/penalty	23,748,244	7,479,006
Log Factor for Penalty (i.e., 10*log(x))	1	10
Sound Power during Period with penalty	23,748,244	74,790,056

Total Daily Sound Power, with penalties	98,538,300
Hours per Day	24
Average Hourly Sound Power, with penalties	4,105,762
Ldn	66.1

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

Construction Activities-Heavy Duty Equipment

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (L _{eq} dBA)	Equipment	Reference Emission Noise Levels (L _{max}) at 50	
				feet ¹	Usage Factor ¹
threshold	2,116	60.0	Concrete Saw	90	0.4
Capitol Towers Apartments	100	86.5	Impact Pile Driver	95	0.4
			Dozer	85	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
Concrete Saw	86.0
Impact Pile Driver	91.0
Dozer	81.0

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

92.5

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).

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

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.

Construction Activities-Heavy Duty Equipment

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (L _{eq} dBA)	Equipment	Reference Emission Noise Levels (L _{max}) at 50	
				feet ¹	Usage Factor ¹
threshold	3,346	60.0	Concrete Saw	90	1
Capitol Towers Apartments	100	90.5	Impact Pile Driver	95	1
			Dozer	85	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 Saw	90.0
Impact Pile Driver	95.0
Dozer	85.0

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

96.5

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).

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

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.

Construction Activities-Heavy Duty Equipment

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (L _{eq} dBA)	Interior Noise Level (Leq dBA)	Equipment	Reference Emission	Usage Factor ¹
					Noise Levels (L _{max}) at 50 feet ¹	
threshold	973	60.0				
Capitol Towers Apartments	100	79.8	55.8	Concrete Mixer Truck	85	0.4
				Concrete Mixer Truck	85	0.4
				Concrete Pump Truck	82	0.16
				Tractor	84	0.4

Ground Type hard
 Source Height 8
 Receiver Height 5
 Ground Factor² 0.00

Predicted Noise Level ³	L _{eq} dBA at 50 feet ³
Concrete Mixer Truck	81.0
Concrete Mixer Truck	81.0
Concrete Pump Truck	74.0
Tractor	80.0

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

85.8

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).

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

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.



Construction Activities-Heavy Duty Equipment

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (L _{eq} dBA)	Equipment	Reference Emission Noise Levels (L _{max}) at 50 feet ¹	
				Usage Factor ¹	feet ¹
threshold	1,614	60.0	Concrete Mixer Truck	1	85
Capitol Towers Apartments	100	84.2	Concrete Mixer Truck	1	85
			Concrete Pump Truck	1	82
			Tractor	1	84

Ground Type hard
Source Height 8
Receiver Height 5
Ground Factor² 0.00

Predicted Noise Level ³	L _{eq} dBA at 50 feet ³
Concrete Mixer Truck	85.0
Concrete Mixer Truck	85.0
Concrete Pump Truck	82.0
Tractor	84.0

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

90.2

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).

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

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.

Distance Propagation Calculations for Stationary Sources of Ground Vibration



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.

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

Noise Source/ID	Reference Noise Level		
	vibration level (VdB)	@	distance (ft)
Impact Pile Driver	112.0	@	25
Impact Pile Driver	112.0	@	25
Impact Pile Driver	112.0	@	25
Impact Pile Driver	112.0	@	25
Distance to Standard	112.0	@	25
Sac RT Light Rail	70.0	@	75

STEP 3A: Select the distance to the receiver.

Attenuated Noise Level at Receptor		
vibration level (VdB)	@	distance (ft)
94	@	100
95	@	90
96	@	85
103	@	50
80	@	300
75	@	50

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

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

Noise Source/ID	Reference Noise Level		
	vibration level (PPV)	@	distance (ft)
Impact Pile Driver	1.518	@	25
Impact Pile Driver	1.518	@	25
Impact Pile Driver	1.518	@	25
Impact Pile Driver	1.518	@	25
Distance to Standard	1.518	@	25
Sac RT Light Rail	0.013	@	75

STEP 3B: Select the distance to the receiver.

Attenuated Noise Level at Receptor		
vibration level (PPV)	@	distance (ft)
0.190	@	100
0.222	@	90
0.242	@	85
0.537	@	50
0.199	@	97
0.024	@	50

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.