Appendix 3.4-A
Noise and Vibration

- **Noise and Vibration Measurements**
- **Noise and Vibration Mitigation Guidelines**

NOISE AND VIBRATION MEASUREMENTS

Tables

Appendix NV Table 1
Long-Term Existing Noise Measurements

Site	City/County	Address	Contributing Noise Source	L_{dn} (dBA)
LT-1	City of Bakersfield	1331 M St	Roadway, Community/Household, Dogs/Birds	64.6
LT-3	City of Bakersfield	9300 Windcreek	Roadway, Aircraft, Community/Household, Dogs/Birds	57.8
LT-4	City of Bakersfield	10304 Palm Ave	Community/Household	71.6
LT-5	City of Bakersfield	1107 Enger St	Community/Household	71.6
LT-6	City of Bakersfield	2800 Lona Dala Dr	Community/Household, Dogs/Birds	74
LT-7	City of Bakersfield	3210 Old Farm Rd	Rail, Community/Household, Dogs/Birds	77.7
LT-8	City of Bakersfield	21541 Paddock Place	Rail, Roadway, Community/Household	68.6
LT-9	City of Bakersfield	4340 Sandy Gap	Rail, Roadway, Community/Household	65.1
LT-10	City of Bakersfield	13417 Cheyenne Mtn. Dr	Roadway, Community/Household	59.6
LT-11	City of Bakersfield	19491 Santa Fe	Roadway, Community/Household	78.8
LT-12	City of Bakersfield	19401 Santa Fe	Rail, Roadway, Community/Household	72.8
LT-13	City of Shafter	31396 Burbank	Rail, Grade Crossing, Roadway, Community/Household	74.4
LT-14	City of Shafter	31327 Orange St	Rail, Roadway, Community/Household	79
LT-15	City of Shafter	380 Marengo	Rail, Roadway, Community/Household, Dogs/Birds	69.6
LT-16	City of Shafter	396 Prince Lane	Roadway, Community/Household	74.9
LT-17	City of Shafter	17422 Poplar	Rail, Roadway, Community/Household	79.4
LT-18	City of Shafter	17037 Scaroni	Rail, Roadway, Community/Household	72.7
LT-19	City of Wasco	16202 Wasco Ave	Rail, Roadway, Community/Household, Dogs/Birds	72.8
LT-20	City of Wasco	15850 Wasco Ave	Rail, Roadway, Community/Household, Dogs/Birds	59.9
LT-21	City of Wasco	29502 Unnamed Street	Rail, Roadway, Community/Household, Children Playing	58.7
LT-22	City of Wasco	1886 G St	Rail, Community/Household	73.2

Appendix NV Table 1
Long-Term Existing Noise Measurements

Site	City/County	Address	Contributing Noise Source	L_{dn} (dBA)
LT-23	City of Wasco	29352 Hwy 46 (Paso Robles Hwy)	Roadway, Industrial/Commercial, Community/Household, Children Playing, Dogs/Birds	73.4
LT-24	City of Wasco	29136 McCombs Rd at Annin Ave	Rail, Grade Crossing, Roadway Community/Household	63
LT-25	City of Wasco	29351 Whisler Rd	Rail, Roadway, Community/Household	62.7
LT-26	City of Wasco	13436 Hwy 43	Rail, Roadway, Community/Household	72
LT-27	City of Wasco	29348 Blankenship	Rail, Roadway, Community/Household	62.1
LT-28	City of Wasco	29350 Peterson	Rail, Roadway, Community/Household	67.2
LT-29	City of Wasco	29305 Second St	Rail, Roadway, Community/Household	73.6
LT-30	City of Wasco	29140 Pond Rd	Rail, Roadway, Community/Household	72.3
LT-31	City of Shafter	13767 Cherry Ave	Rail, Roadway, Community/Household, Dogs/Birds	71.1
LT-32	City of Shafter	1499 E. Los Angeles St	Rail, Grade Crossing, Roadway, Industrial/Commercial, Community/Household	64.4
LT-33	City of Shafter	E. Lerdo Hwy (between S. Beech Ave and Cherry Ave)	Roadway, Community/Household	67.2
LT-34	City of Shafter	1991 E. Lerdo Hwy	Rail, Roadway, Community/Household	66.6
LT-35	City of Shafter	460 Pine St	Roadway, Community/Household	59.4
LT-36	City of Shafter	1450 E. Lerdo Hwy	Rail, Roadway, Industrial/Commercial, Community/Household	61.4
LT-37	City of Shafter	625 E. Fresno Ave	Roadway, Community/Household	58.6
LT-38	City of Shafter	30519 Madera	Community/Household	59.5
LT-39	City of Shafter	17259 Shafter Ave	Roadway, Community/Household	69.2
LT-40	City of Shafter	17207 Mettler Ave	Community/Household	59.1
LT-41	City of Shafter	30348 Madera Ave	Community/Household	58.4
LT-42	City of Shafter	17096 Shafter Ave	Community/Household	61.6

Appendix NV Table 1
Long-Term Existing Noise Measurements

Site	City/County	Address	Contributing Noise Source	L_{dn} (dBA)
LT-43	City of Shafter	30592 Merced Ave	Community/Household	53.7
LT-44	City of Delano	28901 W. Cecil Way	Roadway, Community/Household	65.6
LT-45	City of Delano	Garces Hwy at Central Valley Hwy	Rail, Grade Crossing, Roadway, Community/Household	71.4
LT-46	City of Delano	11098 Hwy 43 (Central Valley Hwy)	Rail, Roadway, Community/Household	73.1
LT-47	City of Wasco	11248 Airport Ave	Rail, Community/Household	59.9
LT-48	City of Delano	8611 Avenue 32	Roadway, Community/Household	76.1
LT-49	County of Tulare	3400 Road 84, Earlimart	Rail, Roadway, Community/Household	64.5
LT-50	County of Tulare	8512 36th Ave, Earlimart	Rail, Roadway, Community/Household	62
LT-51	County of Tulare	8369 Road 84, Earlimart (at Avenue 39)	Rail, Roadway, Community/Household	68.7
LT-52	County of Tulare	9444 Hwy 43	Rail, Roadway, Community/Household	64.4
LT-53	County of Tulare	9582 Hwy 43	Rail, Roadway, Community/Household	64
LT-54	County of Tulare	9952 Hwy 43	Rail, Roadway, Community/Household	64.6
LT-55	City of Corcoran	3922 Avenue 120	Rail, Roadway, Industrial/Commercial, Community/Household	65.2
LT-56	City of Delano	28704 Garces	Roadway, Community/Household, Dogs/Birds	61.5
LT-57	City of Delano	11446 Palm Ave	Rail, Community/Household, Dogs/Birds	59.8
LT-58	City of Corcoran	12728 Avenue 128	Rail, Roadway, Community/Household, Dogs/Birds	64.9
LT-59	City of Corcoran	2364 Avenue 144	Rail, Roadway, Community/Household, Dogs/Birds	65.2
LT-60	City of Corcoran	1847 Avenue 144	Rail, Roadway, Community/Household, Dogs/Birds	70.4
LT-61	City of Corcoran	14624 Hwy 43	Rail, Roadway, Community/Household, Dogs/Birds	66

Appendix NV Table 1
Long-Term Existing Noise Measurements

Site	City/County	Address	Contributing Noise Source	L_{dn} (dBA)
LT-62	City of Corcoran	277 Oregon Ave	Rail, Roadway, Industrial/Commercial, Community/Household	61.4
LT-63	City of Corcoran	83 Whitley	Rail, Roadway, Community/Household	68
LT-64	City of Corcoran	825 Yoder at Brokaw	Rail, Roadway, Community/Household	80.7
LT-65	City of Corcoran	1420 N. Avenue	Rail, Roadway, Community/Household	78.4
LT-66	City of Corcoran	5904 Newark	Rail, Roadway, Community/Household, Dogs/Birds	64.4
LT-67	City of Corcoran	1940 Dairy Ave	Rail, Roadway, Community/Household	65.5
LT-68	City of Corcoran	5701 Niles	Rail, Roadway, Community/Household	64.1
LT-69	City of Corcoran	172 Orange Dr	Roadway, Community/Household, Dogs/Birds	47.6
LT-70	City of Corcoran	21 5th Ave	Community/Household, Dogs/Birds	51.1
LT-71	City of Corcoran	152 5-1/2 Ave	Roadway, Community/Household, Dogs/Birds	72.9
LT-72	City of Corcoran	455 Orange Ave	Roadway, Community/Household, Dogs/Birds	52.5
LT-73	City of Corcoran	5974 Corcoran Hwy	Roadway, Community/Household	65.4
LT-74	City of Corcoran	23088 5-1/2 Ave	Roadway, Community/Household	55.9
LT-75	City of Corcoran	23489 Hwy 43	Rail, Roadway, Community/Household	71.7
LT-76	City of Hanford	7370 Kansas Ave	Roadway, Community/Household, Dogs/Birds	72.6
LT-77	City of Hanford	7549 Kansas Ave	Roadway, Community/Household	54.3
LT-78	City of Hanford	7685 Kansas Ave	Roadway, Community/Household	71
LT-79	City of Hanford	7520 Kent Ave	Roadway, Aircraft, Community/Household, Dogs/Birds	57.8
LT-80	City of Hanford	7290 Kent Ave	Rail, Roadway, Community/Household, Dogs/Birds	55.7
LT-81	City of Hanford	7530 Jersey Ave	Roadway, Community/Household, Dogs/Birds	57.3

Appendix NV Table 1
Long-Term Existing Noise Measurements

Site	City/County	Address	Contributing Noise Source	L_{dn} (dBA)
LT-82	City of Hanford	15664 7th Ave	Roadway, Community/Household, Dogs/Birds	58.5
LT-83	City of Hanford	7577 Jackson Ave	Roadway, Community/Household	58.9
LT-84	City of Hanford	14976 7th Ave at Jackson	Rail, Roadway, Community/Household	58
LT-85	City of Hanford	14419 8th Ave	Roadway, Community/Household	55.5
LT-86	City of Hanford	7025 Idaho St	Roadway, Industrial/Commercial, Community/Household	65.2
LT-87	City of Hanford	7343 Houston	Roadway, Community/Household	67.9
LT-88	City of Hanford	7740 Houston	Roadway, Aircraft, Industrial/Commercial, Community/Household	64.9
LT-89	City of Hanford	7480 Hanford–Armona Rd	Roadway, Aircraft, Community/Household	57.9
LT-90	City of Hanford	7818 Hanford–Armona Rd	Roadway, Aircraft, Community/Household, Dogs/Birds	58.3
LT-91	City of Hanford	10535 8th Ave	Roadway, Aircraft, Community/Household, Dogs/Birds	52.3
LT-92	City of Hanford	9944 Ponderosa	Roadway, Industrial/Commercial, Community/Household, Dogs/Birds	60.2
LT-93	City of Hanford	9724 Ponderosa	Roadway, Aircraft, Community/Household, Dogs/Birds	55.3
LT-94	City of Hanford	7794 Grangeville Blvd	Roadway, Community/Household, Dogs/Birds	56
LT-95	City of Hanford	7974 Grangeville Blvd	Roadway, Community/Household	60.4
LT-96	City of Hanford	8791 8th Ave	Roadway, Community/Household	59.5
LT-97	City of Hanford	8361 Flint	Roadway, Aircraft, Industrial/Commercial, Community/Household, Dogs/Birds	55.3
LT-98	City of Hanford	8290 Flint	Roadway, Community/Household	56
LT-99	City of Hanford	7895 Fargo	Roadway, Aircraft, Community/Household, Dogs/Birds	58.5
LT-100	City of Hanford	7755 Fargo	Rail, Roadway, Aircraft, Community/Household, Dogs/Birds	60.6
LT-101	City of Hanford	6141 8-1/2 Ave	Roadway, Industrial/Commercial, Community/Household, Dogs/Birds	49.6

Appendix NV Table 1
Long-Term Existing Noise Measurements

Site	City/County	Address	Contributing Noise Source	L_{dn} (dBA)
LT-102	City of Hanford	8352 Elder	Roadway, Community/Household	48.8
LT-103	City of Hanford	8125 Elder	Roadway, Community/Household	46.7
LT-104	City of Hanford	8813 Excelsior	Aircraft, Community/Household, Dogs/Birds	63
LT-105	City of Hanford	4490 9th Ave	Roadway, Community/Household, Dogs/Birds	57.5
LT-106	City of Hanford	3739 9-1/2 Ave	Community/Household, Dogs/Birds	49.9
LT-107	City of Hanford	10560 Denver	Rail, Roadway, Community/Household, Dogs/Birds	53.8
LT-108	County of Fresno	3127 10-1/2 Ave	Industrial/Commercial, Community/Household, Dogs/Birds	50.6
LT-109	County of Fresno	2853 Boundary Rd	Roadway, Community/Household, Dogs/Birds	61.3
LT-110	County of Fresno	8066 E. Riverdale	Roadway, Industrial/Commercial, Community/Household, Dogs/Birds	63.1
LT-111	County of Fresno	5606 Davis	Roadway, Aircraft, Community/Household, Dogs/Birds	56.9
LT-112	County of Fresno	5083 E. Elkhorn	Roadway, Community/Household, Dogs/Birds	63.5
LT-113	County of Fresno	16257 S. Minnewawa	Aircraft, Community/Household, Dogs/Birds	63.7
LT-114	County of Fresno	4224 Clarkson	Rail, Community/Household	66.3
LT-115	County of Fresno	15521 Peach	Rail, Roadway, Community/Household, Dogs/Birds	74.1
LT-116	County of Fresno	14474 Willow	Rail, Community/Household, Dogs/Birds	63.7
LT-117	County of Fresno	3289 Kamm	Rail, Roadway, Community/Household	64.5
LT-118	County of Fresno	13198 Chestnut	Rail, Roadway, Community/Household, Dogs/Birds	70.2
LT-119	City of Fresno	2313 Mountain View	Rail, Roadway, Community/Household, Dogs/Birds	67.6
LT-120	City of Fresno	2960 E. Nebraska	Rail, Roadway, Industrial/Commercial, Community/Household, Dogs/Birds	77
LT-121	City of Fresno	2625 E. Rose	Rail, Roadway, Community/Household, Dogs/Birds	65.8

Appendix NV Table 1
Long-Term Existing Noise Measurements

Site	City/County	Address	Contributing Noise Source	L_{dn} (dBA)
LT-122	City of Fresno	2530 E. Floral	Rail, Roadway, Community/Household	75.1
LT-123	City of Fresno	2311 Dinuba	Rail, Community/Household, Dogs/Birds	64.4
LT-124	City of Fresno	2342 E. Springfield	Rail, Community/Household, Dogs/Birds	70.2
LT-125	City of Fresno	8179 S. Maple	Rail, Roadway, Community/Household	58.1
LT-126	City of Fresno	2047 E. Adams	Rail, Grade Crossing, Roadway, Community/Household	66.8
LT-127	City of Fresno	2070 Clayton	Rail, Grade Crossing, Roadway, Community/Household	65.9
LT-128	City of Fresno	5511 S. Maple	Roadway, Industrial/Commercial, Community/Household	64.9
LT-129	City of Fresno	2235 Malaga	Rail, Roadway, Community/Household, Dogs/Birds	79.3
LT-130	City of Fresno	2109 Malaga	Rail, Roadway, Community/Household	69.4
LT-132	City of Fresno	2366 S. Grace	Rail, Roadway, Community/Household	75.2
LT-133	City of Fresno	2201 Nicholas Ave	Roadway, Community/Household	70.8
LT-134	City of Fresno	205 F St	Roadway, Community/Household	68.5
LT-135	City of Fresno	158 N. Roosevelt	Roadway, Community/Household	69
LT-136	City of Fresno	239 N. Ferger	Roadway, Community/Household	68.3
LT-137	City of Fresno	718 Arthur Ave	Roadway, Community/Household	71.8
LT-138	City of Fresno	425 N. Westley	Rail, Roadway, Community/Household	61.8
LT-139	City of Fresno	937 N. Fruit Ave	Roadway, Community/Household	68.8
LT-140	City of Fresno	1219 Esther	Roadway, Community/Household	72.1
LT-141	City of Fresno	1286 Esther	Roadway, Community/Household	66.3
LT-142	City of Fresno	1941 N. Golden State Hwy	Rail, Roadway, Community/Household	73.2
LT-143	City of Fresno	1647 W. Normal	Rail, Roadway, Community/Household	71.6

Appendix NV Table 1
Long-Term Existing Noise Measurements

Site	City/County	Address	Contributing Noise Source	L_{dn} (dBA)
LT-144	City of Fresno	1415 W. McKinley	Rail, Grade Crossing, Roadway, Community/Household	77.3
LT-145	City of Shafter	18455 Driver Rd	Community/Household	57.2
LT-146	City of Shafter	16455 Shafter Rd	Roadway, Community/Household	55.3
LT-147	City of Shafter	2502 Zachary Ave	Roadway, Community/Household	57.8
LT-148	City of Wasco	Unnamed Road - Between Gromer Ave and McCombs Ave	Roadway, Community/Household	61.4
LT-149	City of Wasco	Corner of 6th St and Root Ave	Roadway, Community/Household	55.1
LT-150	City of Fresno	1636 Broadway	Roadway, Community/Household	61
LT-151	City of Fresno	517 Farris	Roadway, Community/Household	67.5
LT-152	City of Fresno	1503 C St	Roadway, Community/Household	64.2
LT-153	City of Fresno	635 Fresno St at Pottle	Roadway, Community/Household	64.5
LT-154	City of Fresno	1127 Tulare St	Roadway, Community/Household	64.6
LT-155	City of Fresno	1105 Kern St	Roadway, Community/Household	62.8
LT-156	City of Fresno	248 N. Van Ness Ave	Roadway, Community/Household	60.9
LT-157	City of Fresno	310 N. Fulton St at Mildreda Ave	Roadway, Community/Household	66.4
LT-158	City of Fresno	405 Effie	Roadway, Aircraft, Community/Household, Dogs/Birds	67.1
LT-159	City of Bakersfield	415 Delores	Rail, Roadway, Community/Household	63.1
LT-160	City of Bakersfield	725 Eureka St	Roadway, Community/Household	59.4
LT-161	City of Bakersfield	1306 E. 19th Ave	Rail, Roadway, Community/Household	68.3
LT-162	City of Bakersfield	1430 Eureka	Rail, Roadway, Community/Household	58.1
LT-163	City of Bakersfield	1054 Washington St	Rail, Roadway, Community/Household	66.1
LT-164	City of Bakersfield	827 Chico St at Beale Ave	Roadway, Community/Household	61.8
LT-165	City of Bakersfield	1414 11th St	Rail, Roadway, Community/Household	63.2
LT-166	City of Bakersfield	2126 Larcus St	Roadway, Community/Household	61

Appendix NV Table 1
Long-Term Existing Noise Measurements

Site	City/County	Address	Contributing Noise Source	L_{dn} (dBA)
LT-167	City of Bakersfield	1106 Quantico St	Rail, Roadway, Community/Household	59.1
LT-168	City of Bakersfield	2900 Citrus Ave	Rail, Roadway, Community/Household	61.2
LT-169	City of Bakersfield	2001 Kentucky St	Rail, Roadway, Community/Household	66.3
LT-170	City of Bakersfield	2333 Center St	Rail, Roadway, Community/Household	63.5
LT-171	City of Bakersfield	2619 Trust St	Rail, Roadway, Community/Household	62.5
LT-172	City of Bakersfield	2903 Pioneer Dr (Edison Village)	Rail, Roadway, Community/Household	57.4
LT-173	City of Bakersfield	721 Oswell St (Black & White Mobile Home Lodge)	Rail, Roadway, Community/Household	71.1
LT-174	City of Bakersfield	3309 Camellia St	Rail, Roadway, Community/Household	70.2
LT-175	City of Bakersfield	301 Cooley Dr	Rail, Roadway, Community/Household	72.3
LT-176	City of Bakersfield	6601 Eucalyptus Dr	Rail, Roadway, Community/Household	60.4
LT-177	City of Bakersfield	706 Zinara St	Rail, Community/Household	67.4
LT-178	City of Bakersfield	4312 Deacon	Roadway, Community/Household	61.1
LT-179	City of Bakersfield	250 Fairfax Rd (Bakersfield Palms RV Resort)	Rail, Roadway, Community/Household	66.6
LT-180	City of Bakersfield	7749 Mills Dr	Rail, Roadway, Community/Household, Dogs/Birds	64.6
LT-181	City of Bakersfield	426 Monica St	Rail, Community/Household	65.8
LT-182	City of Bakersfield	8633 E. Brundage Lane	Rail, Roadway, Community/Household	68.1
LT-183	City of Bakersfield	9307 Brillow Dr	Rail, Roadway, Community/Household	61.7
LT-184	City of Bakersfield	355 S. Vineland Rd	Rail, Grade Crossing, Roadway, Community/Household	66
LT-185	City of Bakersfield	963 Buna Lane	Rail, Roadway, Community/Household	65.9
LT-186	City of Bakersfield	12252 Atlantic St	Rail, Roadway, Community/Household	65.6

Appendix NV Table 1
Long-Term Existing Noise Measurements

Site	City/County	Address	Contributing Noise Source	L_{dn} (dBA)
LT-187	City of Bakersfield	1660 Pine St at Truxtun Ave	Rail, Roadway, Community/Household	66.8
LT-188	City of Bakersfield	2009 California St	Roadway, Community/Household, Children Playing	69.7
LT-189	City of Bakersfield	701 Oleander Ave	Roadway, Community/Household	60.5
LT-190	City of Bakersfield	301 A St at 3rd St	Roadway, Community/Household	62.3
LT-191	City of Bakersfield	1621 6th St	Roadway, Community/Household	68.6
LT-192	City of Bakersfield	1015 O St (Corner of N and 11th)	Roadway, Community/Household	63.8
LT-193	City of Bakersfield	906 3rd St (Corner of P and 3rd)	Roadway, Community/Household	69
LT-194	City of Bakersfield	200 Texas St (Corner of Texas and King)	Roadway, Community/Household	64.6
LT-197	City of Bakersfield	2311 19th St	Roadway, Community/Household, Dogs/Birds	67.8
LT-198	City of Bakersfield	2323 Spruce	Roadway, Community/Household	71.3
LT-199	City of Bakersfield	2330 21st St	Roadway, Community/Household	65.9
LT-200	City of Bakersfield	528 Monterey	Roadway, Community/Household	63.8
LT-201	City of Laton	19948 S. Fowler Ave	Rail, Roadway, Community/Household	66.2
LT-202	City of Laton	21030 S. Fowler Ave	Rail, Roadway, Community/Household	67.4
LT-203	City of Hanford	4767 12th Ave	Rail, Community/Household	62.1
LT-204	City of Hanford	2264 N. Heron Dr	Rail, Roadway, Community/Household	70.7
LT-205	City of Hanford	2098 N. Heron Dr	Rail, Roadway, Community/Household	71.1
LT-206	City of Hanford	444 Ford St	Rail, Roadway, Community/Household	77.3
LT-207	City of Hanford	807 W. 7th St	Rail, Roadway, Community/Household	60.5
LT-208	City of Hanford	18026 10th Ave	Rail, Community/Household	76.5
LT-209	City of Hanford	2043 Kings Rd	Rail, Community/Household	68.9
LT-210	City of Hanford	1005 W. Water St	Rail, Community/Household	70.5

Appendix NV Table 1
Long-Term Existing Noise Measurements

Site	City/County	Address	Contributing Noise Source	L_{dn} (dBA)
LT-211	City of Hanford	10833 Malta St	Rail, Community/Household	67
LT-212	City of Hanford	502 Phillips St	Rail, Roadway, Community/Household	70.4
LT-213	City of Hanford	1125 Rodgers Rd	Rail, Roadway, Community/Household	65.8
LT-214	City of Hanford	1515 Thornton St	Rail, Roadway, Community/Household	73.6
LT-215	City of Hanford	410 Scott St	Rail, Community/Household	74
LT-216	City of Hanford	4728 12th Ave	Rail, Community/Household	59.9
LT-217	City of Hanford	4592 12th Ave	Rail, Community/Household	61.5

Source: URS/HMM/Arup Joint Venture, Fresno to Bakersfield Noise and Vibration Technical Report (Oakland, CA: URS Corporation, May 2010).

Acronyms:
dBA = A-weighted decibel(s)
L_{dn} = day-night sound level
LT = long-term

Appendix NV Table 2
Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured L_{eq} (dBA)	Estimated L_{dn} (dBA)
ST-1	Bakersfield	Bakersfield High School (14th and F St)	Rail, Roadway, Aircraft, Children Playing, Dogs/Birds	59.5	69.1
ST-2	Bakersfield	2215 Truxtun Ave	Rail, Roadway, Aircraft	77.8	79.9
ST-3	Bakersfield	Intersection of Myrtle and California	Roadway, Community/Household, Dogs/Birds	71.4	72.1
ST-4	Bakersfield	Jastro Park	Roadway, Community/Household	68.7	71.2
ST-5	Bakersfield	Beale Memorial Library (701 Truxtun Ave)	Rail, Roadway, Dogs/Birds	57.8	67.7
ST-6	Bakersfield	Franklin Elementary School (2400 Truxtun Ave)	Rail, Roadway, Aircraft, Community/Household	65	68.8
ST-7	Bakersfield	1109 Harvest Creek	Roadway, Aircraft, Community/Household, Dogs/Birds	64.9	69.0
ST-8	Bakersfield	8600 Lyn River	Roadway, Aircraft, Community/Household	67.4	71.4
ST-9	Bakersfield	Jewetta Ave (Suncrest RV Park)	Rail, Roadway, Community/Household	59.8	64.2
ST-10	Bakersfield	2050 Verdugo La	Rail, Roadway, Community/Household, Dogs/Birds	57	68.8
ST-11	Bakersfield	2001 Dean Ave	Rail, Roadway, Community/Household, Dogs/Birds	55.3	54.3
ST-12	Bakersfield	3209 Nebula Court	Rail, Aircraft, Community/Household, Dogs/Birds	58.5	59.5
ST-13	Bakersfield	4408 Allen Rd	Rail, Grade Crossing, Roadway, Community/Household, Dogs/Birds	74.7	75.7
ST-14a	Bakersfield	14527 Palm Ave	Rail, Grade Crossing, Roadway, Aircraft, Community/Household	53.4	65.9
ST-14b	Bakersfield	14527 Palm Ave	Rail, Grade Crossing, Roadway, Aircraft, Community/Household	49	64.1

Appendix NV Table 2
Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured L_{eq} (dBA)	Estimated L_{dn} (dBA)
ST-15	Bakersfield	13017 Hageman Frontage Rd	Roadway, Aircraft, Community/Household, Dogs/Birds	65.8	78.4
ST-16	Bakersfield	Frontier High School (6401 Allen Rd)	Rail, Grade Crossing, Roadway, Aircraft, Children Playing	43.8	58.9
ST-17	Bakersfield	Pentecostal Church of God + house (32186 7th Standard)	Rail, Grade Crossing, Roadway, Community/Household	66.6	78.1
ST-18	Bakersfield	19441 Santa Fe Rd	Rail, Grade Crossing, Roadway, Community/Household	71.6	83
ST-19	Shafter	31363 Orange St	Rail, Grade Crossing, Community/Household, Dogs/Birds	46.7	61.2
ST-20	Shafter	18631 Santa Fe Rd	Rail, Grade Crossing, Roadway, Community/Household, Dogs/Birds	52.8	67.3
ST-21	Shafter	1240 Los Angeles	Rail, Grade Crossing, Roadway, Community/Household	57.1	65.8
ST-22	Shafter	455 E. Ash	Rail, Grade Crossing, Roadway, Community/Household	58	66.7
ST-23	Shafter	511 Jackson	Rail, Grade Crossing, Roadway, Children Playing	68.3	69.6
ST-24	Shafter	Shafter High School (526 Mannel Ave)	Rail, Grade Crossing, Roadway, Children Playing	60.2	68.3
ST-25	Wasco	29600 Kimberlina	Rail, Grade Crossing, Community/Household	42.5	48.2
ST-26	Wasco	29895 Merced Ave	Rail, Grade Crossing, Roadway, Community/Household	72	72.7
ST-27	Wasco	715 Mayer Lane	Rail, Grade Crossing, Roadway, Community/Household, Children Playing, Dogs/Birds	68.1	72.5
ST-28	Wasco	Redwood Elementary School (331 Shafter Ave)	Rail, Grade Crossing, Roadway	64.2	70.7

Appendix NV Table 2
Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured L_{eq} (dBA)	Estimated L_{dn} (dBA)
ST-29	Wasco	397 Fresno Ave	Roadway, Aircraft, Dogs/Birds	58	64.4
ST-30	Wasco	Prospect and Hwy 43	Rail, Grade Crossing, Roadway	63.6	69
ST-31	Wasco	Kimberlina	Rail, Roadway, Dogs/Birds	63.3	68.7
ST-32	Wasco	Theresa Burke Elementary School (Filburn and Griffith, Wasco)	Rail, Roadway, Aircraft, Community/Household, Children Playing	56.2	61.8
ST-33	Wasco	15848 Griffith Ave	Rail, Roadway, Aircraft, Community/Household, Children Playing, Dogs/Birds	42.7	48.2
ST-34	Wasco	4th St at F St	Rail, Roadway, Aircraft, Industrial/Commercial, Children Playing	69	70.9
ST-35	Wasco	Wasco Child Development Center (764 H St)	Rail, Grade Crossing, Roadway	67.4	69.3
ST-36	Wasco	St. Johns School (9th St at Broadway)	Rail, Roadway Community/Household, Children Playing, Dogs/Birds	60.6	66.7
ST-37	Wasco	Filburn Ave	Rail, Roadway, Community/Household, Dogs/Birds	38.1	57.8[1]
ST-38	Wasco	Karl F. Clemens Middle School (5th St at Broadway)	Rail, , Roadway, Aircraft, Community/Household, Children Playing, Dogs/Birds	63.3	67.4
ST-39	Wasco	Thomas Jefferson Middle School (Griffith at 1st St)	Rail, Roadway, Children Playing, Dogs/Birds	57.9	63
ST-40	Wasco	Gromer Ave at Annin St	Rail, Grade Crossing, Roadway, Community/Household, Dogs/Birds	60.4	65.6
ST-41	Wasco	Hwy 43 at Taussig Ave	Rail, Roadway, Dogs/Birds	64.9	72.4
ST-42	Wasco	28994 Taussig Ave	Roadway, Aircraft, Community/Household	62.2	69.6
ST-43	Wasco	28998 Blankenship Ave	Rail, Dogs/Birds	49.5	55
ST-44	Wasco	29398 Blankenship Ave	Rail, Roadway, Community/Household	49.8	55.4

Appendix NV Table 2
Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured L_{eq} (dBA)	Estimated L_{dn} (dBA)
ST-45	Wasco	29370 Peterson Rd	Rail, Roadway, Community/Household, Dogs/Birds	60.2	65.7
ST-46	Wasco	29380 Elmo near Hwy 43	Roadway	55.5	66.9
ST-47	Wasco	29160 Pond Rd	Rail, Roadway, Dogs/Birds	69	69.9
ST-48	Wasco	11815 Pond Rd, Wasco	Rail, Roadway, Children Playing, Dogs/Birds	58.3	64.9
ST-49	Shafter	31793 Riverside St	Roadway, Aircraft, Community/Household, Dogs/Birds	53.6	45.4
ST-50	Shafter	18455 Driver Rd	Roadway, Aircraft, Community/Household, Dogs/Birds	55.5	47.3
ST-51	Shafter	Fresno Ave	Rail, Roadway, Community/Household, Children Playing	59.7	66
ST-52	Shafter	Field at corner of Beech and Canal	Rail, Roadway, Community/Household, Children Playing	43.9	50.1
ST-53	Shafter	30998 Fresno Ave	Rail, Aircraft, Community/Household, Dogs/Birds	56.5	61.3
ST-54	Shafter	1740 Beech	Roadway, Aircraft, Community/Household, Dogs/Birds	61.6	66.4
ST-55	Shafter	350 Pine St	Rail, Roadway, Community/Household, Dogs/Birds	55.4	62.1
ST-56	Shafter	1190 Weyand Way at State St	Rail, Aircraft, Dogs/Birds	73.3	62.1
ST-57	Shafter	31145 Fresno	Rail, Roadway, Aircraft	52.3	62.1
ST-58	Shafter	17431 Mannel Ave	Roadway, Community/Household, Dogs/Birds	52.7	62.1
ST-59	Shafter	Mannel Ave	Rail, Roadway, Industrial/Commercial, Community/Household, Dogs/Birds	54.7	64.1

Appendix NV Table 2
Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured L_{eq} (dBA)	Estimated L_{dn} (dBA)
ST-60	Shafter	Shafter Ave	Rail, Roadway, Community/Household, Dogs/Birds	57.1	57.5
ST-61	Shafter	17413 Mettler	Rail, Roadway, Aircraft, Dogs/Birds	52.4	52.8
ST-62	Shafter	155 Redwood Dr	Roadway, Aircraft	54.8	61.3
ST-63	Shafter	100 Walker St (Behind Shafter Museum)	Rail, Roadway, Dogs/Birds	67.7	74.1
ST-64	Shafter	Merced Ave	Roadway	63.6	65.6
ST-65	Shafter	Unknown	Roadway, Children Playing	55	58.6
ST-66	Shafter	17052 Shafter Ave	Rail, Roadway, Community/Household	45	51.4
ST-67	Shafter	Merced Ave	Rail, Roadway, Community/Household, Dogs/Birds	55.3	61.7
ST-68	Shafter	30345 Merced Ave	Roadway	60.8	59.1
ST-69	Shafter	Merced Ave	Roadway, Aircraft Community/Household, Dogs/Birds	60.2	66.6
ST-70	Shafter	30749 Merced	Community/Household	59.1	65.9
ST-71	Shafter	29140 Schuster Rd	Rail, Roadway, Community/Household	47.7	66.7[1]
ST-72	Wasco	Schuster Rd	Rail, Roadway, Dogs/Birds	60.2	65.4
ST-73	Wasco	11242 Hwy 43	Roadway, Children Playing	68.1	72.2
ST-74	Wasco	Schuster Rd	Roadway	62.9	66.9
ST-75	Wasco	28994 Garces Hwy	Rail, Roadway, Community/Household	60	65.3
ST-76	Wasco	28820 Garces Hwy	Rail, Roadway, Dogs/Birds	65.9	61.5
ST-77	Earlimart	2990 Road 84	Roadway, Aircraft, Community/Household, Children Playing, Dogs/Birds	49	51.3
ST-78	Earlimart	8830 Avenue 24	Rail, Grade Crossing, Roadway, Dogs/Birds	63.2	65.6
ST-79	Earlimart	Avenue 32	Roadway, Aircraft, Dogs/Birds	47.4	68.7[1]

Appendix NV Table 2
Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured L_{eq} (dBA)	Estimated L_{dn} (dBA)
ST-80	Earlimart	3442 Road 84	Rail, Roadway, Dogs/Birds	53.7	64.5
ST-81	Earlimart	4011 Road 84	Rail, Grade Crossing, Roadway, Industrial/Commercial	64.4	71.2
ST-82	Earlimart	3764 Road 84	Rail, Roadway, Community/Household	58.4	65.1
ST-83a	Corcoran	Avenue 108	Rail, Roadway, Community/Household, Dogs/Birds	52.5	57.4
ST-83b	Corcoran	Avenue 108	Rail, Roadway, Dogs/Birds	53.4	62.4
ST-84	Corcoran	11200 Hwy 43 at Avenue 112	Rail, Grade Crossing, Roadway, Aircraft, Dogs/Birds	47.8	62.4
ST-85	Wasco	28794 Shuster Ave, Wasco	Roadway, Community/Household, Dogs/Birds	53.8	59.8
ST-86	Wasco	Schuster Rd near Palm Ave	Rail, Roadway, Dogs/Birds	41.8	60.9
ST-87	Wasco	28384 Garces Hwy	Roadway, Dogs/Birds	65.3	70.3
ST-88	Wasco	11237 Magnolia	Roadway, Industrial/Commercial, Children Playing, Dogs/Birds	58.6	63.5
ST-89	Earlimart	3141 Avenue 36	Rail, Grade Crossing, Roadway, Dogs/Birds	41.4	59.5
ST-90	Corcoran	14942 Hwy 43	Rail, Roadway, Aircraft	60.7	68.2
ST-91	Corcoran	710 Hanna Ave	Rail, Roadway, Community/Household, Dogs/Birds	61.2	69.9
ST-92	Corcoran	747 Hall Ave	Rail, Roadway, Industrial/Commercial, Dogs/Birds	59.8	68.5
ST-93	Corcoran	1000 Paterson	Rail, Roadway	70	78.4
ST-94	Corcoran	614 Otis (Kings Mobile Lodge)	Rail, Roadway, Dogs/Birds	70.3	78.4
ST-95	Corcoran	Hale St at North Ave	Roadway, Dogs/Birds	60.7	62
ST-96	Corcoran	6269 Newark Rd	Rail, Roadway, Dogs/Birds	49.3	61.6

Appendix NV Table 2
Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured L_{eq} (dBA)	Estimated L_{dn} (dBA)
ST-97	Corcoran	320 Otis	Rail, Grade Crossing, Roadway, Community/Household, Dogs/Birds	64.5	76.8
ST-98	Corcoran	23756 5th Avenue	Roadway, Dogs/Birds	59.4	62.6
ST-99	Corcoran	306 5th Avenue	Rail, Roadway, Community/Household	54.5	57.7
ST-100	Corcoran	5th Avenue at Niles Rd	Roadway	43.4	49.5
ST-101	Corcoran	23261 5th Ave	Rail, Roadway, Aircraft, Community/Household, Dogs/Birds	46.9	47.3
ST-102	Corcoran	23340 5-1/2 Ave	Rail, Roadway, Community/Household, Dogs/Birds	61.8	62.2
ST-103	Hanford	22075 8th Avenue	Roadway, Dogs/Birds	55.7	59.4
ST-104	Hanford	7603 Kent Avenue	Rail, Roadway, Aircraft, Community/Household, Dogs/Birds	54.8	60.2
ST-105	Hanford	16299 7th Ave	Rail, , Roadway, Aircraft, Community/Household	59.6	60.5
ST-106	Hanford	16680 7th Ave	Roadway, Aircraft, Community/Household	59.6	60.5
ST-107	Hanford	12051 8th Avenue at Hwy 43	Roadway, Community/Household	57.8	58.7
ST-108	Hanford	13320 7th Ave	Roadway, Aircraft, Community/Household, Dogs/Birds	52.2	57.2
ST-109	Hanford	13012 7th Ave	Roadway, Aircraft, Dogs/Birds	55.2	60.2
ST-110	Hanford	7696 Grangeville Rd	Roadway, Aircraft, Dogs/Birds	52.6	59.7
ST-111	Hanford	8229 Flint Ave	Rail, Roadway, Community/Household, Dogs/Birds	55.2	58.8
ST-112	Hanford	7746 Fargo	Roadway, Aircraft, Industrial/Commercial, Dogs/Birds	52.5	58

Appendix NV Table 2
Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured L_{eq} (dBA)	Estimated L_{dn} (dBA)
ST-113	Hanford	7968 Fargo	Rail, Roadway, Community/Household, Dogs/Birds	51.7	56
ST-114	Hanford	3295 10th Ave	Roadway	65.4	68
ST-115	Selma	Clarkson	Rail, Roadway, Dogs/Birds	58.6	59.2
ST-115b	Selma	16495 Minnewawa	Rail, Roadway	55.4	61.9
ST-116	Selma	14677 South Willow	Rail, Aircraft, Community/Household, Dogs/Birds	53.2	58.6
ST-117	Selma	2136 Rose Ave	Rail, Roadway, Aircraft, Community/Household, Dogs/Birds	62.6	65.3
ST-118	Fresno	Monroe Elementary School (on Chestnut)	Roadway, Industrial/Commercial, Dogs/Birds	58.7	64.1
ST-119	Fresno	12382 Chestnut	Rail, Roadway, Community/Household	56.7	62.2
ST-120	Fresno	8254 Cedar	Rail, Roadway, Aircraft, Community/Household, Dogs/Birds	53.6	58.6
ST-121	Fresno	Pacific Union Elementary School (Corner of Rowell and Bowles)	Rail, Roadway, Community/Household, Dogs/Birds	55.6	60.7
ST-122	Fresno	2419 Manning Ave	Roadway, Community/Household, Dogs/Birds	63.2	70.2
ST-123	Fresno	2189 East Morton	Rail, Roadway, Aircraft, Dogs/Birds	65.2	60.9
ST-124	Fresno	2120 American	Rail, Roadway, Aircraft, Dogs/Birds	64.1	66.2
ST-125	Fresno	2097 Jefferson	Rail, Roadway, Community/Household, Dogs/Birds	66	61.6
ST-126	Fresno	4199 Cedar Ave	Roadway, Community/Household, Dogs/Birds	63.6	68.9
ST-127	Fresno	2233 Church St	Rail, Roadway, Aircraft, Industrial/Commercial	63.5	66.8

Appendix NV Table 2
Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured L_{eq} (dBA)	Estimated L_{dn} (dBA)
ST-128	Fresno	1814 H St	Rail, Roadway, Aircraft	57.1	59.4
ST-129	Fresno	Motel Drive at Olive St (Roeding Park)	Rail, Roadway, Dogs/Birds	61.4	68.6
ST-130	Fresno	704 Adeline Ave	Rail, Roadway, Community/Household, Dogs/Birds	55.6	59.7
ST-131	Fresno	1636 Broadway	Rail, Roadway, Aircraft, Industrial/Commercial, Community/Household	59.7	63.9
ST-132	Fresno	660 F St	Rail, Industrial/Commercial, Community/Household	60	63.7
ST-133	Fresno	852 Divisadero (Iron Bird Lofts)	Rail, Roadway, Aircraft, Industrial/Commercial, Community/Household	55.4	60.7
ST-134	Fresno	1383 N. Golden State Blvd (Town House Motel)	Rail, Roadway, Industrial/Commercial	56.2	62.3
ST-135	Fresno	1436 University Ave	Roadway, Aircraft, Industrial/Commercial	55.8	68.6
ST-136	Fresno	1631 Weldon Ave	Rail Roadway Community/Household Dogs/Birds	54.6	58.3
ST-137	Fresno	1224 University	Rail, Roadway	58.2	58.2
ST-138	Fresno	1125 West Ave or Northwest Ave	Roadway, Community/Household, Dogs/Birds	56.9	66.7
ST-139	Fresno	Fremont Elementary School (University Ave)	Rail, Roadway, Community/Household, Children Playing	55.8	65.5
ST-140	Fresno	530 W. Florida Ave	Rail, Roadway, Community/Household, Dogs/Birds	53.9	66.1
ST-141	Shafter	31793 Riverside St	Rail, Roadway, Community/Household, Dogs/Birds	48.1	54
ST-142	Shafter	16819 N. Shafter Ave	Roadway, Industrial/Commercial, Community/Household	59.2	68.2

Appendix NV Table 2
Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured L_{eq} (dBA)	Estimated L_{dn} (dBA)
ST-143	Shafter	29577 Poso Drive	Rail, Roadway, Aircraft, Community/Household, Dogs/Birds	53	62.4
ST-144	Fresno	Bethel Temple Church (1224 Kern St)	Roadway, Aircraft, Industrial/Commercial, Dogs/Birds	60.9	66.9
ST-145	Fresno	Buddhist Temple (1129 Tulane)	Rail, Roadway, Aircraft, Industrial/Commercial, Dogs/Birds	56.9	61.4
ST-146	Fresno	La Vena's Educational Center (1015 Fresno St)	Roadway, Industrial/Commercial	68.4	71.2
ST-147	Fresno	School ground on Stanislaus St	Rail, Roadway, Community/Household, Children Playing, Dogs/Birds	58	59.6
ST-148	Fresno	Park at corner of Amador and C St	Roadway, Dogs/Birds	60.1	61.8
ST-149	Fresno	Glory Bound Ministries (916 Waterman at Kern St)	Rail, Roadway, Aircraft, Community/Household, Dogs/Birds	58.8	61.1
ST-150	Fresno	Boys and Girls Club (930 Tulare St at Mayor)	Rail, Roadway, Aircraft, Community/Household, Dogs/Birds	57.5	59.3
ST-151	Fresno	Life Ministries (552 Tuolumne St)	Rail, Roadway, Aircraft, Dogs/Birds	65.2	66.7
ST-152	Fresno	1904 McKenzie	Rail, Roadway, Aircraft, Community/Household	67.3	73.8
ST-153	Fresno	472 Calaveras	Rail, Roadway, Industrial/Commercial, Dogs/Birds	59.4	65.7
ST-154	Fresno	313 Blackstone	Roadway, Community/Household	61.5	63.1
ST-155	Fresno	1225 Divisadero St at Poplar Ave	Rail, Roadway, Aircraft, Industrial/Commercial, Community/Household	62.2	66.1
ST-156	Fresno	455 Broadway (Broadmont Apartments)	Roadway, Aircraft, Industrial/Commercial	60.8	64
ST-157	Fresno	(West of) 282 San Pablo	Rail, Roadway, Aircraft, Community/Household, Dogs/Birds	61.4	63.5

Appendix NV Table 2
Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured L_{eq} (dBA)	Estimated L_{dn} (dBA)
ST-158	Bakersfield	1227 Miller St	Rail, Roadway, Aircraft, Community/Household, Dogs/Birds	62.2	70.7
ST-159	Bakersfield	Bessie Owens Intermediate School (815 Eureka St at King St)	Rail, Roadway, Dogs/Birds	55	60.4
ST-160	Bakersfield	400 Chico	Rail, Roadway	56.9	62.8
ST-161	Bakersfield	Alpine St	Rail, Roadway, Aircraft, Community/Household	61.7	70.4
ST-162	Bakersfield	Grace Christian Center (231 Beale Avenue at Chico	Roadway, Community/Household, Children Playing, Dogs/Birds	59.3	64.8
ST-163	Bakersfield	Unknown	Roadway, Children Playing, Dogs/Birds	54.6	59.6
ST-164	Bakersfield	Our Lady of Guadalupe Church (601 E. California Ave)	Roadway, Industrial/Commercial, Dogs/Birds	67.6	73.9
ST-165	Bakersfield	Martin Luther King Jr. Memorial Park; California Veteran Memorial Building (Corner of Owens St and California Ave)	Roadway, Industrial/Commercial, Children Playing, Dogs/Birds	59	63.2
ST-166	Bakersfield	Church (1020 E. California Ave)	Roadway, Aircraft, Dogs/Birds	59.5	63.7
ST-167	Bakersfield	Mt. Vernon Elementary School (2162 Potomac Ave)	Roadway, Children Playing, Dogs/Birds	64.1	68.5
ST-168	Bakersfield	Corner of Exchange St and Steele Ave	Rail, Roadway, Dogs/Birds	59.7	64.1
ST-169	Bakersfield	1241 Ogden	Roadway, Aircraft, Dogs/Birds	60.1	70.8
ST-170	Bakersfield	Potomac Park	Rail, Roadway, Community/Household, Dogs/Birds	60.1	66.4
ST-171	Bakersfield	Corner of Center St and Tauchen St	Rail, Roadway, Dogs/Birds	63.4	69.2
ST-172	Bakersfield	1008 Webster	Aircraft, Dogs/Birds	61.6	67.4
ST-173	Bakersfield	2509 E. California	Rail, Roadway, Community/Household, Dogs/Birds	58.4	65.4

Appendix NV Table 2
Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured L_{eq} (dBA)	Estimated L_{dn} (dBA)
ST-174	Bakersfield	2523 Steele St	Rail, Roadway, Community/Household, Dogs/Birds	62.7	61.3
ST-175	Bakersfield	Lake St	Rail, Roadway	51.3	59.3
ST-176	Bakersfield	612 Descano St	Rail, Roadway, Community/Household, Children Playing	59.5	61.9
ST-177	Bakersfield	Ramon Garza School (2901 Center St)	Rail, Roadway, Children Playing, Dogs/Birds	68.8	71.2
ST-178	Bakersfield	3201 Edison Hwy	Rail, Roadway, Community/Household	72.8	75.2
ST-179	Bakersfield	526 Normandy Way (Corner of Normandy and Sterling)	Roadway, Community/Household, Dogs/Birds	62.7	74.1
ST-180	Bakersfield	3815 Edison	Roadway	66.9	75.2
ST-181	Bakersfield	Virginia Avenue School (3301 Virginia Ave, Bakersfield)	Roadway, Children Playing	59.3	71.3
ST-182	Bakersfield	Unitarian-Universalist Fellowship (Corner of Deacon St and Sterling Rd)	Roadway, Dogs/Birds	54	65.9
ST-183	Bakersfield	317 Sterling	Rail, Roadway, Industrial/Commercial	61	72.9
ST-184	Bakersfield	Foothill High School (501 Park Dr, Bakersfield)	Rail, Roadway, Community/Household, Dogs/Birds	52.4	58.1
ST-185	Bakersfield	The Church of Jesus Christ of Latter Day Saints (851 Monica St)	Roadway, Dogs/Birds	57.3	65.6
ST-186	Bakersfield	300 Royal	Rail, Roadway	61.1	65.8
ST-187	Bakersfield	Edison Middle School (721 Edison Rd, Bakersfield)	Roadway	67.1	76.3
ST-188	Bakersfield	415 Monica St	Community/Household, Dogs/Birds	54.6	63.7
ST-189	Bakersfield	532 Pepper	Rail, Dogs/Birds	60.9	70
ST-190	Bakersfield	Penn Elementary School (2201 San Emidio St)	Rail, Roadway, Community/Household, Dogs/Birds	53.1	63

Appendix NV Table 2
Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured L_{eq} (dBA)	Estimated L_{dn} (dBA)
ST-191	Bakersfield	3131 Truxtun Ave–Corner of Oak St and Truxtun Ave	Roadway	71.5	75.7
ST-192	Bakersfield	3114 Chester Lane	Roadway, Industrial/Commercial	63.6	65.7
ST-193	Bakersfield	Beale Park (Corner of Dracena St and Oleander Ave)	Roadway, Community/Household, Dogs/Birds	57.2	66.8
ST-194	Bakersfield	Church of the Brethren (2471 Palm St at A St)	Roadway, Children Playing	66.1	67.5
ST-195	Bakersfield	1608 E St	Rail, Roadway, Aircraft, Community/Household, Dogs/Birds	57	59.8
ST-196	Bakersfield	Lowell Park (Corner of 4th St and P St)	Roadway, Dogs/Birds	61.2	65.7
ST-197	Bakersfield	Beale Park (1980 Palm St)	Roadway, Dogs/Birds	54.2	56.5
ST-198	Bakersfield	10th St	Roadway	61.8	73.4
ST-199	Bakersfield	Bakersfield Police Activity League (413 East 3rd St (Corner of Marsh and 3rd)	Roadway, Children Playing, Dogs/Birds	57.8	60.5
ST-200	Bakersfield	John Fremont School	Roadway, Children Playing, Dogs/Birds	56.7	59.4
ST-201	Bakersfield	Trinity Methodist Church (Corner of Niles and King streets	Roadway, Aircraft, Dogs/Birds	61	62.7
ST-202	Bakersfield	1070 Tulare	Rail, Roadway, Aircraft, Dogs/Birds	55.6	57.2
ST-203	Bakersfield	Jastro Park (Corner of Elm St and 18th St)	Roadway, Children Playing, Dogs/Birds	61	69
ST-204	Bakersfield	2330 Elm St	Roadway, Aircraft	69.7	69.9
ST-205	Hanford	1158 Northstar Dr	Rail, Community/Household, Dogs/Birds	63.3	70.7
ST-206	Hanford	1041 Willow Dr	Rail, Community/Household	55.4	68.9
ST-207	Hanford	1052 Minaret Pl	Rail, Community/Household	51.9	68.9
ST-208	Hanford	1950 Roland Dr	Roadway, Community/Household	46.6	71.1
ST-209	Hanford	10796 Hume Ave	Rail, Community/Household	54.4	67.0

Appendix NV Table 2
Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured L_{eq} (dBA)	Estimated L_{dn} (dBA)
ST-210	Hanford	1117 Audubon Rd	Rail, Community/Household	58.1	71.1
ST-211	Hanford	11125 Doris St	Rail, Community/Household	62.8	74.0
ST-212	Hanford	10221 Kansas Ave	Rail, Community/Household, Dogs/Birds	61.7	76.5
ST-213	Hanford	10870 Thompson Dr	Rail, Community/Household, Dogs/Birds	52.7	67.0
ST-214	Hanford	11582 10-1/2 Ave	Rail, Community/Household	53.6	70.4

Source: URS/HMM/Arup Joint Venture, Fresno to Bakersfield Noise and Vibration Technical Report (Oakland, CA: URS Corporation, May 2010).

Note: The L_{eq} (h) and L_{dn} for these LT sites differs by approximately 20 dB, and the short-term measurement was taken during one of the quietest hours of the LT data.

Acronyms:
dB = decibel
dBA = A-weighted decibels
L_{dn} = day-night sound level, dBA
L_{eq} = equivalent sound level, dBA
LT = long-term
ST = short-term

Appendix NV Table 3
Existing Vibration Measurements

Site	Address	Event Descriptions	Distance to Tracks	Predicted (VdB)
V-01	11901 Snowberry Lane, Bakersfield	BNSF Freight EB, BNSF GT EB, BNSF GT WB, BNSF DS EB	65 ft	90
V-02	10430 Glenn St, Green Acres	Amtrak WB, BNSF WB, BNSF EB, Amtrak EB, BNSF WB	92 ft	84
V-03	2500 Jewetta Ave #27, Bakersfield	BNSF WB, Amtrak and BNSF, BNSF, Amtrak (2) w/ MC, BNSF, EB, Amtrak, Amtrak	60 ft	91
V-04	11501 Mockingbird Court, Bakersfield	Amtrak EB 1/6, BNSF Engines 2/0, BNSF Freight EB 3/28/2, BNSF DS WB 4/98/0	105–110 ft	83
V-05	12013 Compass Ave, Bakersfield	Amtrak WB, BNSF EB, BNSF WB, BNSF WB, Amtrak EB	70 ft	89
V-06	8611 Avenue 32, Earlimart	Amtrak EB 1/4, BNSF EB 4/ / 2, BNSF EB 4/	75 ft	88
V-07	417 Dolores St, Bakersfield	BNSF–WB 2/117 TOFC Empty at 25 mph (40 kph), BNSF–EB 75/2 Tank Cars at 25 mph (40 kph), AMBIENT	165 ft	72
V-08	721 Oswell St, Bakersfield	BNSF–EB Mixed 4/88/2 at 45 mph (72 kph), AMBIENT	93 ft	85
V-09	250 Fairfax Rd, Site 320, Bakersfield Palms RV Park, Bakersfield	UPRR–WB DS /92/1 at 35-45 mph	163 ft	77
V-10	2264 N. Heron Place, Hanford	Amtrak EB 4/1 at 45 mph, Amtrak WB 1/4 at 45 mph, BNSF–EB Mixed 3/55/2 at 45 mph, BNSF–EB Grain 3/108 at 45 mph, BNSF–EB Mixed 3/95/2 at 45 mph, Amtrak WB 1/4 at 45 mph, BNSF–EB Mixed 3/88/2 at 45 mph, BNSF–EB Mixed 3/103/2 at 30 mph, Amtrak EB 4/1 at 50 mph, BNSF–EB Mixed 2/3 at 45 mph	108 ft	83 at 45 mph, 80 at 30 mph, 84 at 50 mph
V-11	1158 W. Northstar Dr, Hanford	Amtrak EB 4/1 at 45 mph, Amtrak WB 1/4 at 45 mph, BNSF–EB Mixed 3/55/2 at 45 mph, BNSF–EB Grain 3/108 at 45 mph, BNSF–EB Mixed 3/95/2 at 45 mph, Amtrak WB 1/4 at 45 mph, BNSF–EB Mixed 3/88/2 at 45 mph, BNSF–EB Mixed 3/103/2 at 30 mph, Amtrak EB 4/1 at 50 mph, BNSF–EB Mixed 2/3 at 45 mph, BNSF–EB Mixed 2/3 at 45 mph	166 ft	77 at 45 mph, 78 at 50 mph, 74 at 30 mph

Appendix NV Table 3
Existing Vibration Measurements

Site	Address	Event Descriptions	Distance to Tracks	Predicted (VdB)
V-12	2098 N. Heron Place, Hanford	BNSF–WB DS/TOFC 4/105 at 45 mph, BNSF–EB 3 at 45 mph, BNSF–WB Mixed 5/86 at 45 mph, BNSF–WB Auto Racks 3/71 at 40 mph, Amtrak WB 1/4 at 45 mph	183 ft	76 at 45 mph, 75 at 40 mph

Source: URS/HMM/Arup Joint Venture, Fresno to Bakersfield Noise and Vibration Technical Report (Oakland, CA: URS Corporation, May 2010).

Note: x / y / z = number of x locos, y cars, z locos

Acronyms:

BNSF	BNSF Railway
EB	eastbound
DS	double stack
GT	grain train
hh:	12-hour clock, with a leading zero (e.g., 07)
kph	kilometer(s) per hour
m	meters
MC	motorcycle
mixed	mixed freight
mm	minutes with a leading zero
mph	mile(s) per hour
TOFC	trailer on flat car
UPRR	Union Pacific
VdB	RMS vibration velocity level, dB
WB	westbound

Appendix NV Table 4
Potential Noise Impacts Long-Term Measurement Sites along the
BNSF Alternative without Mitigation for Design Year 2035

Site	Source Height (feet)	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn}-dBA)	Projected HST Noise Level (L_{dn}-dBA)	Impact Criteria		Total Noise Level (L_{dn}-dBA)	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
Fresno										
LT-128	8	1,150	Residential	65	62	61	66	67	2	Moderate
LT-129	10	224	Residential	79	70	65	75	80	1	Moderate
LT-130	10	476	Residential	69	67	64	69	71	2	Moderate
LT-132	3	317	Residential	75	68	65	73	76	1	Moderate
LT-133	3	531	Residential	71	66	65	70	72	1	Moderate
LT-134	3	690	Residential	69	64	63	68	70	1	Moderate
LT-152	3	1,926	Residential	64	59	60	66	65	1	None
LT-153	3	3,869	Residential	65	56	61	66	65	1	None
LT-154	3	1,886	Residential	65	59	61	66	66	1	None
LT-155	3	1,992	Residential	63	59	59	65	64	2	None
Hanford										
LT-087	5	620	Residential	68	65	63	68	70	2	Moderate
LT-088	6	1,361	Residential	65	61	61	66	66	2	Moderate
LT-089	3	185	Residential	58	71	57	62	71	14	Severe
LT-090	3	1,797	Residential	58	60	57	63	62	4	Moderate
LT-091	20	2,147	Residential	52	59	54	60	60	7	Moderate
LT-092	30	90	Residential	60	73	58	64	74	13	Severe
LT-093	30	138	Residential	55	72	55	61	72	17	Severe
LT-094	3	1,492	Residential	56	61	56	62	62	6	Moderate
LT-095	3	2,580	Residential	60	58	58	64	62	2	None

Appendix NV Table 4
Potential Noise Impacts Long-Term Measurement Sites along the
BNSF Alternative without Mitigation for Design Year 2035

Site	Source Height (feet)	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn}-dBA)	Projected HST Noise Level (L_{dn}-dBA)	Impact Criteria		Total Noise Level (L_{dn}-dBA)	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
LT-096	3	2,595	Residential	59	58	58	63	62	2	Moderate
LT-097	3	4,589	Residential	55	55	55	61	58	3	None
LT-098	3	4,319	Residential	56	55	56	62	59	3	None
LT-099	3	2,117	Residential	59	59	56	62	62	3	Moderate
LT-100	3	1,675	Residential	61	60	58	64	63	3	Moderate
LT-101	6	5,220	Residential	50	55	53	59	56	6	Moderate
LT-102	6	4,465	Residential	49	55	53	59	56	7	Moderate
LT-103	5	3,498	Residential	47	56	52	59	57	10	Moderate
LT-104	6	6,192	Residential	63	54	60	65	63	0	None
LT-105	6	6,367	Residential	58	54	56	62	59	1	None
LT-106	11	6,883	Residential	50	53	53	60	55	5	Moderate
LT-107	19	9,133	Residential	54	53	55	61	56	2	None
LT-108	15	9,122	Residential	51	52	54	60	55	4	None
LT-109	11	8,980	Residential	61	52	59	64	62	1	None
LT-110	8	8,621	Residential	63	52	60	65	63	0	None
LT-111	12	4,267	Residential	57	56	56	62	59	3	None
LT-112	9	1,708	Residential	63	60	60	65	65	2	Moderate
LT-113	8	167	Residential	64	72	60	65	73	9	Severe
LT-114	12	130	Residential	66	73	62	67	74	8	Severe
LT-115	43	68	Residential	74	73	65	72	76	2	Severe
LT-116	13	187	Residential	64	72	60	65	72	8	Severe
LT-117	12	535	Residential	65	66	61	66	68	4	Severe

Appendix NV Table 4
Potential Noise Impacts Long-Term Measurement Sites along the
BNSF Alternative without Mitigation for Design Year 2035

Site	Source Height (feet)	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn}-dBA)	Projected HST Noise Level (L_{dn}-dBA)	Impact Criteria		Total Noise Level (L_{dn}-dBA)	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
LT-118	7	442	Residential	70	67	64	70	72	2	Moderate
LT-119	6	752	Residential	68	64	63	68	69	2	Moderate
LT-120	13	124	Residential	77	74	65	75	79	2	Moderate
LT-121	9	270	Residential	66	69	61	67	71	5	Severe
LT-122	7	121	Residential	75	74	65	73	77	2	Severe
LT-123	9	194	Residential	64	71	60	66	72	8	Severe
LT-124	7	268	Residential	70	69	64	70	73	3	Moderate
LT-125	13	970	Residential	58	63	57	62	64	6	Severe
LT-126	10	980	Residential	67	63	62	67	68	2	Moderate
LT-127	8	178	Residential	66	72	61	67	73	7	Severe
Corcoran										
LT-059	16	922	Residential	65	64	61	66	67	2	Moderate
LT-060	16	1,943	Residential	70	60	65	70	71	0	None
LT-061	15	792	Residential	66	64	61	67	68	2	Moderate
LT-062	32	782	Residential	61	64	59	64	66	5	Severe
LT-063	12	4,823	Residential	68	55	63	68	68	0	None
LT-064	3	375	Residential	81	68	65	75	81	0	Moderate
LT-065	4	100	Residential	78	75	65	75	80	1	Moderate
LT-066	7	531	Residential	64	66	60	66	68	4	Severe
LT-067	7	220	Residential	65	70	61	66	72	6	Severe
LT-068	9	577	Residential	64	66	60	66	68	4	Moderate

Appendix NV Table 4
Potential Noise Impacts Long-Term Measurement Sites along the
BNSF Alternative without Mitigation for Design Year 2035

Site	Source Height (feet)	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn}-dBA)	Projected HST Noise Level (L_{dn}-dBA)	Impact Criteria		Total Noise Level (L_{dn}-dBA)	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
LT-069	3	5,950	Residential	48	54	53	59	55	7	Moderate
LT-070	3	4,463	Residential	51	55	54	60	57	6	Moderate
LT-071	9	413	Residential	73	67	65	72	74	1	Moderate
LT-072	7	3,822	Residential	53	56	54	60	58	5	Moderate
LT-073	4	4,632	Residential	84	55	65	75	84	0	None
LT-074	11	5,552	Residential	56	54	56	62	58	2	None
LT-075	12	383	Residential	72	68	65	71	73	1	Moderate
LT-076	11	6,415	Residential	73	54	65	71	73	0	None
LT-077	12	5,772	Residential	54	54	55	61	57	3	None
LT-078	11	4,765	Residential	71	55	65	70	71	0	None
LT-079	11	3,634	Residential	58	57	57	62	60	2	None
LT-080	11	4,844	Residential	56	55	56	61	58	3	None
LT-081	7	1,638	Residential	57	60	56	62	62	5	Moderate
LT-082	11	3,089	Residential	59	57	57	63	61	2	Moderate
LT-083	12	42	Residential	59	79	57	63	79	20	Severe
LT-084	9	2,692	Residential	58	58	57	62	61	3	Moderate
LT-085	10	1,848	Residential	56	60	56	61	61	6	Moderate
LT-086	5	2,277	Residential	65	59	61	66	66	1	None
LT-208	17	7,436	Residential	77	53	65	74	77	0	None
Pixley										
LT-052	6	958	Residential	64	63	60	66	67	2	Moderate
LT-053	9	698	Residential	64	65	60	66	67	3	Moderate

Appendix NV Table 4
Potential Noise Impacts Long-Term Measurement Sites along the
BNSF Alternative without Mitigation for Design Year 2035

Site	Source Height (feet)	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn}-dBA)	Projected HST Noise Level (L_{dn}-dBA)	Impact Criteria		Total Noise Level (L_{dn}-dBA)	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
LT-054	10	871	Residential	65	64	61	66	67	2	Moderate
LT-055	5	1,560	Residential	65	60	61	66	66	1	None
LT-058	10	2,125	Residential	65	59	61	66	66	1	None
Allensworth										
LT-026	28	289	Residential	72	69	65	71	74	2	Moderate
LT-027	24	1,390	Residential	62	61	59	64	65	3	Moderate
LT-028	7	1,034	Residential	67	63	62	68	68	1	Moderate
LT-029	9	661	Residential	74	65	65	72	74	1	None
LT-030	9	81	Residential	72	76	65	71	77	5	Severe
LT-044	8	785	Residential	66	64	61	67	68	2	Moderate
LT-045	9	795	Residential	71	64	65	70	72	1	None
LT-046	8	402	Residential	73	67	65	72	74	1	Moderate
LT-047	8	1,541	Residential	60	61	58	63	63	3	Moderate
LT-048	14	196	Residential	76	71	65	74	77	1	Moderate
LT-049	11	348	Residential	65	68	61	66	70	5	Severe
LT-050	11	312	Residential	62	69	59	64	70	8	Severe
LT-051	10	228	Residential	69	70	63	69	73	4	Severe
LT-056	8	2,903	Residential	62	57	59	64	63	1	None
LT-057	8	2,626	Residential	59	58	57	63	61	3	Moderate
Wasco-Shafter										
LT-009a	5	1,021	Residential	60	62	58	63	64	4	Moderate

Appendix NV Table 4
Potential Noise Impacts Long-Term Measurement Sites along the
BNSF Alternative without Mitigation for Design Year 2035

Site	Source Height (feet)	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn}-dBA)	Projected HST Noise Level (L_{dn}-dBA)	Impact Criteria		Total Noise Level (L_{dn}-dBA)	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
LT-009b	5	901	Residential	60	63	58	63	65	5	Moderate
LT-009	7	679	Residential	65	65	61	66	68	3	Moderate
LT-010	5	1,061	Residential	60	62	58	63	64	5	Moderate
LT-011a	7	621	Residential	65	65	60	66	68	3	Moderate
LT-011	8	14	Residential	79	76	65	75	81	2	Severe
LT-012	8	84	Residential	73	76	65	72	77	5	Severe
LT-013	5	171	Residential	74	72	65	73	76	2	Moderate
LT-014	32	172	Residential	79	71	65	75	80	1	Moderate
LT-015a	67	873	Residential	64	66	60	66	68	4	Severe
LT-015	67	544	Residential	70	68	64	69	72	2	Moderate
LT-016a	19	681	Residential	64	65	60	66	68	4	Moderate
LT-016b	23	686	Residential	61	65	58	64	66	5	Severe
LT-016	18	236	Residential	75	71	65	73	76	1	Moderate
LT-017	10	240	Residential	79	70	65	75	80	0	Moderate
LT-018	9	332	Residential	73	68	65	71	74	1	Moderate
LT-019	27	184	Residential	73	71	65	72	75	2	Moderate
LT-020	38	630	Residential	60	66	58	63	67	7	Severe
LT-021	39	3,092	Residential	59	58	57	63	61	3	Moderate
LT-022	40	20	Residential	73	65	65	72	74	1	None
LT-023	38	1,557	Residential	73	61	65	72	74	0	None
LT-024	8	1,219	Residential	63	62	60	65	65	2	Moderate
LT-025	9	1,454	Residential	63	61	59	65	65	2	Moderate

Appendix NV Table 4
Potential Noise Impacts Long-Term Measurement Sites along the
BNSF Alternative without Mitigation for Design Year 2035

Site	Source Height (feet)	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn}-dBA)	Projected HST Noise Level (L_{dn}-dBA)	Impact Criteria		Total Noise Level (L_{dn}-dBA)	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
LT-031	58	1,651	Residential	71	63	65	70	72	1	None
LT-032	70	1,777	Residential	64	64	60	66	67	3	Moderate
LT-033	70	3,496	Residential	67	61	62	68	68	1	None
LT-034	70	5,377	Residential	67	59	62	67	67	1	None
LT-035	68	3,457	Residential	59	61	57	63	63	4	Moderate
LT-036	69	4,451	Residential	61	60	59	64	64	2	Moderate
LT-037	42	4,427	Residential	59	57	57	63	61	2	None
LT-038	13	4,171	Residential	60	56	58	63	61	2	None
LT-039	15	6,160	Residential	69	54	64	69	69	0	None
LT-040	9	3,736	Residential	59	56	57	63	61	2	None
LT-041	14	3,456	Residential	58	57	57	63	61	2	None
LT-042	13	6,093	Residential	62	54	59	64	62	1	None
LT-043	14	7,680	Residential	54	53	55	61	56	3	None
LT-145	5	8,567	Residential	57	52	56	62	58	1	None
LT-146	10	11,905	Residential	55	51	55	61	57	1	None
LT-147	6	9,318	Residential	58	52	57	62	59	1	None
LT-148	10	2,800	Residential	61	58	59	64	63	2	None
LT-149	43	5,656	Residential	55	56	55	61	58	3	Moderate
Bakersfield										
LT-001	50	279	Residential	65	70	61	66	71	6	Severe
LT-003	58	164	Residential	58	71	57	62	71	13	Severe

Appendix NV Table 4
Potential Noise Impacts Long-Term Measurement Sites along the
BNSF Alternative without Mitigation for Design Year 2035

Site	Source Height (feet)	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn}-dBA)	Projected HST Noise Level (L_{dn}-dBA)	Impact Criteria		Total Noise Level (L_{dn}-dBA)	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
LT-004	10	134	Residential	72	73	65	71	75	4	Severe
LT-005	3	114	Residential	72	74	65	71	76	4	Severe
LT-006	3	59	Residential	74	77	65	72	79	5	Severe
LT-007	3	3	Residential	78	92	65	75	93	15	Severe
LT-008	5	482	Residential	69	66	63	69	71	2	Moderate
LT-159	38	124	Residential	63	72	60	65	73	9	Severe
LT-187	65	1,055	Residential	67	65	62	67	69	2	Moderate
LT-188	52	928	Residential	70	65	64	69	71	1	Moderate
LT-189	55	2,455	Residential	60	61	58	64	64	3	Moderate
LT-190	63	4,230	Residential	62	59	59	65	64	2	None
LT-191	50	3,195	Residential	69	59	63	68	69	0	None
LT-192	50	1,324	Residential	64	63	60	65	66	3	Moderate
LT-193	48	4,362	Residential	69	57	64	69	69	0	None
LT-194	39	5,243	Residential	65	56	61	66	65	1	None
LT-197	60	1,950	Residential	68	62	63	68	69	1	None
LT-198	67	3,682	Residential	71	60	65	70	72	0	None
LT-199	62	2,779	Residential	66	61	61	67	67	1	None
LT-200	39	3,487	Residential	64	58	60	65	65	1	None

Acronyms:
FRA Federal Rail Authority
HST high-speed train
L_{dn} day-night sound level
VdB vibration velocity level

Appendix NV Table 5

Potential Noise Impacts Short-Term Measurement Sites along the BNSF Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
Fresno										
ST-124	10	714	Residential	66	65	62	67	68	2	Moderate
ST-126	7	1,290	Residential	69	61	64	69	70	1	None
ST-127	3	544	Residential	67	66	62	67	69	2	Moderate
ST-132	3	402	Residential	64	67	60	65	69	5	Severe
ST-144	3	1,633	Institutional	67	60	67	72	68	1	None
ST-145	3	1,877	Institutional	61	60	64	69	64	2	None
ST-146	3	2,415	Institutional	71	58	70	75	71	0	None
ST-147	3	2,775	Institutional	60	58	63	68	62	2	None
ST-149	3	4,161	Institutional	61	56	63	69	62	1	None
ST-150	3	2,780	Institutional	59	58	62	68	62	2	None
ST-151	3	2,628	Institutional	67	58	67	72	67	1	None
ST-152	3	4,856	Residential	74	55	65	72	74	0	None
ST-154	3	4,422	Residential	63	55	60	65	64	1	None
Hanford										
ST-107	10	2,142	Residential	59	59	57	63	62	3	Moderate
ST-108	6	2,439	Residential	57	58	56	62	61	4	Moderate
ST-109	7	2,375	Residential	60	58	58	63	62	2	Moderate
ST-110	3	1,263	Residential	60	61	58	63	64	4	Moderate
ST-111	3	3,919	Residential	59	56	57	63	61	2	None
ST-112	3	1,413	Residential	58	61	57	62	63	5	Moderate
ST-113	3	2,763	Residential	56	58	56	62	60	4	Moderate

Appendix NV Table 5

Potential Noise Impacts Short-Term Measurement Sites along the BNSF Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
ST-114	12	7,722	Residential	68	53	63	68	68	0	None
ST-115a	13	1,274	Residential	59	62	57	62	64	4	Moderate
ST-115b	6	697	Residential	62	64	59	64	66	4	Severe
ST-115c	35	1,442	Residential	58	62	57	63	63	5	Moderate
ST-116	23	690	Residential	59	65	61	66	66	7	Severe
ST-117	6	2,261	Residential	65	59	65	71	66	1	None
ST-118	11	1,368	Institutional	64	61	59	65	66	2	None
ST-119	3	753	Residential	62	64	57	63	66	4	Moderate
ST-120	13	1,150	Residential	59	62	62	67	64	5	Moderate
ST-121b	6	290	Residential	67	69	63	69	71	4	Severe
ST-121	7	806	Institutional	61	64	65	70	66	5	Moderate
ST-122	6	876	Residential	70	63	58	64	71	1	None
ST-123	10	237	Residential	61	70	59	64	71	10	Severe
ST-125	10	696	Residential	62	65	65	71	66	5	Severe
Corcoran										
ST-089	8	2,378	Residential	60	58	58	63	62	3	Moderate
ST-090	14	436	Residential	68	67	63	68	71	3	Moderate
ST-091	4	412	Residential	70	67	64	69	72	2	Moderate
ST-092	5	456	Residential	69	67	63	68	71	2	Moderate
ST-093	6	131	Residential	78	73	65	75	80	1	Moderate
ST-094	5	40	Residential	78	79	65	75	82	4	Severe
ST-095	4	836	Residential	62	63	59	64	66	4	Moderate
ST-096	7	1,006	Residential	62	63	59	64	65	4	Moderate

Appendix NV Table 5

Potential Noise Impacts Short-Term Measurement Sites along the BNSF Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
ST-097	5	188	Residential	77	71	65	75	78	1	Moderate
ST-098	10	6,009	Residential	63	54	59	65	63	1	None
ST-099	4	2,877	Residential	58	57	57	62	61	3	Moderate
ST-100	9	3,842	Residential	50	56	53	59	57	8	Moderate
ST-101	10	7,344	Residential	47	53	53	59	54	7	Moderate
ST-102	10	4,650	Residential	62	55	59	65	63	1	None
ST-103	21	3,287	Residential	59	57	57	63	61	2	None
ST-104	10	3,421	Residential	60	57	58	63	62	2	None
ST-105	6	4,767	Residential	61	55	58	64	62	1	None
ST-106	8	5,474	Residential	61	54	58	64	61	1	None
ST-212	17	8,442	Residential	77	53	65	74	77	0	None
Pixley										
ST-083	8	1,954	Residential	57	59	56	62	62	4	Moderate
ST-084	5	2,694	Residential	62	58	59	65	64	1	None
Allensworth										
ST-041	10	54	Residential	72	78	65	71	79	7	Severe
ST-042	13	2,447	Residential	70	59	64	69	70	0	None
ST-043	24	2,373	Residential	55	59	55	61	60	5	Moderate
ST-044	23	2,636	Residential	55	58	55	61	60	5	Moderate
ST-045	8	2,680	Residential	66	58	61	67	66	1	None
ST-046	6	2,767	Residential	67	58	62	67	67	0	None
ST-047	10	245	Residential	70	70	64	69	73	3	Severe

Appendix NV Table 5

Potential Noise Impacts Short-Term Measurement Sites along the BNSF Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
ST-048	10	919	Residential	65	63	61	66	67	2	Moderate
ST-071	8	1,171	Residential	67	62	62	67	68	1	None
ST-072	7	645	Residential	65	65	61	66	68	3	Moderate
ST-073	8	197	Residential	72	71	65	71	75	2	Severe
ST-074	10	707	Residential	67	65	62	67	69	2	Moderate
ST-075	8	1,817	Residential	65	60	61	66	66	1	None
ST-076	8	2,584	Residential	62	58	59	64	63	2	None
ST-077	14	2,017	Residential	51	60	54	60	60	9	Moderate
ST-078	12	855	Residential	66	64	61	67	68	2	Moderate
ST-079	12	1,185	Residential	69	62	63	69	70	1	None
ST-080	10	1,497	Residential	65	61	60	66	66	2	Moderate
ST-081	10	183	Residential	71	72	65	70	74	3	Severe
ST-082	10	214	Residential	65	71	61	66	72	7	Severe
ST-085	8	3,501	Residential	60	57	58	63	61	2	None
ST-086	8	2,006	Residential	61	59	58	64	63	2	Moderate
ST-087	8	6,112	Residential	70	54	65	70	70	0	None
ST-088	8	7,445	Residential	64	53	60	65	64	0	None
Wasco-Shafter										
ST-014b	5	1,079	Residential	64	62	60	66	66	2	Moderate
ST-016	6	3,904	Institutional	59	56	62	68	61	2	None
ST-017	5	44	Institutional	78	79	70	80	82	3	Moderate
ST-018	6	36	Residential	83	80	65	75	85	2	Severe
ST-019	25	1,237	Residential	61	62	58	64	65	3	Moderate

Appendix NV Table 5

Potential Noise Impacts Short-Term Measurement Sites along the BNSF Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
ST-020	15	288	Residential	67	69	62	68	71	4	Severe
ST-021	70	957	Residential	66	66	61	67	69	3	Moderate
ST-022a	68	871	Residential	64	67	60	66	68	4	Severe
ST-022	68	937	Residential	67	66	62	67	69	3	Moderate
ST-023c	68	832	Residential	64	67	60	66	69	5	Severe
ST-023	66	255	Residential	70	70	64	69	73	3	Severe
ST-024	56	1,987	Institutional	68	62	68	73	69	1	None
ST-025	10	3,612	Residential	48	57	53	59	57	9	Moderate
ST-026	9	223	Residential	73	70	65	71	75	2	Moderate
ST-027a	14	842	Residential	64	64	60	66	67	3	Moderate
ST-027	14	319	Residential	73	69	65	71	74	2	Moderate
ST-028a	40	879	Residential	64	64	60	66	67	3	Moderate
ST-028	44	693	Institutional	71	66	70	75	72	1	None
ST-029	16	1,397	Residential	64	61	60	66	66	2	Moderate
ST-030	30	472	Residential	69	67	64	69	71	2	Moderate
ST-031	10	504	Residential	69	66	63	69	71	2	Moderate
ST-032	39	2,540	Institutional	62	59	64	69	64	2	None
ST-033	38	2,246	Residential	48	60	53	59	60	12	Severe
ST-034	41	587	Residential	71	66	65	70	72	1	Moderate
ST-035	44	294	Institutional	69	69	69	74	72	3	Moderate
ST-036	49	1,873	Institutional	67	62	67	72	68	1	None
ST-037	39	1,713	Residential	58	61	57	62	63	5	Moderate

Appendix NV Table 5

Potential Noise Impacts Short-Term Measurement Sites along the BNSF Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
ST-038	41	1,889	Institutional	67	61	67	73	68	1	None
ST-039	35	2,593	Institutional	63	59	65	70	64	1	None
ST-040	18	1,181	Residential	66	62	61	67	67	2	Moderate
ST-049	4	7,526	Residential	45	53	52	59	54	8	Moderate
ST-050	5	8,692	Residential	47	52	53	59	53	6	None
ST-051	43	4,358	Residential	66	57	61	67	66	0	None
ST-052	62	3,775	Residential	50	59	53	60	60	10	Moderate
ST-053	68	7,546	Residential	61	57	59	64	63	1	None
ST-054	37	7,407	Residential	66	54	62	67	67	0	None
ST-055	68	2,837	Residential	62	61	59	65	65	3	Moderate
ST-056	68	3,541	Residential	62	60	59	65	64	2	Moderate
ST-057	68	8,380	Residential	62	57	59	65	63	1	None
ST-058	29	5,125	Residential	62	55	59	65	63	1	None
ST-059	20	5,897	Residential	64	54	60	66	65	0	None
ST-060	14	5,175	Residential	58	55	56	62	59	2	None
ST-061	14	1,782	Residential	53	60	54	60	61	8	Moderate
ST-062	29	1,220	Residential	61	62	59	64	65	3	Moderate
ST-063	43	242	Residential	74	70	65	73	76	1	Moderate
ST-064	13	8,056	Residential	66	53	61	67	66	0	None
ST-065	24	2,513	Residential	59	58	57	63	61	3	Moderate
ST-066	14	7,581	Residential	51	53	54	60	55	4	None
ST-067	14	6,285	Residential	62	54	59	64	62	1	None
ST-068	10	4,691	Residential	59	55	57	63	61	1	None
ST-069	11	3,404	Residential	67	57	62	67	67	0	None

Appendix NV Table 5

Potential Noise Impacts Short-Term Measurement Sites along the BNSF Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
ST-070	17	8,548	Residential	66	53	61	67	66	0	None
ST-141	3	7,649	Residential	54	53	55	61	56	2	None
ST-142	8	9,478	Residential	68	52	63	68	68	0	None
ST-143	44	5,492	Residential	62	56	59	65	63	1	None
Bakersfield										
ST-001	50	21	Institutional	69	64	69	74	70	1	None
ST-002	60	576	Residential	80	67	65	75	80	0	Moderate
ST-003a	65	976	Residential	62	66	59	65	67	5	Severe
ST-003	68	850	Residential	72	67	65	71	73	1	Moderate
ST-004a	70	1,160	Residential	61	66	58	64	67	6	Severe
ST-004	70	1,041	Institutional	71	66	70	75	72	1	None
ST-005a	44	857	Residential	63	65	59	65	67	4	Moderate
ST-005	46	335	Institutional	68	69	68	73	71	4	Moderate
ST-006	63	1,089	Institutional	69	65	68	74	70	2	None
ST-007	72	428	Residential	69	69	64	69	72	3	Severe
ST-008a	74	643	Residential	60	68	58	63	69	9	Severe
ST-008	74	93	Residential	71	70	65	70	74	2	Moderate
ST-008b	74	1,735	Residential	62	64	59	64	66	4	Moderate
ST-009	3	153	Residential	64	72	60	66	73	9	Severe
ST-010	7	371	Residential	69	68	63	69	71	3	Moderate
ST-011	10	486	Residential	54	66	55	61	67	12	Severe
ST-012	3	193	Residential	60	71	58	63	71	12	Severe

Appendix NV Table 5

Potential Noise Impacts Short-Term Measurement Sites along the BNSF Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
ST-013	4	576	Residential	76	65	65	74	76	0	Moderate
ST-015	4	326	Residential	78	68	65	75	79	0	Moderate
ST-160	39	84	Residential	63	73	59	65	73	10	Severe
ST-161	40	930	Residential	70	64	65	70	71	1	None
ST-164	39	1,357	Institutional	74	62	70	77	74	0	None
ST-190	60	1,822	Institutional	63	63	65	70	66	3	None
ST-191	74	912	Residential	76	67	65	74	76	1	Moderate
ST-192	74	2,101	Residential	66	63	61	67	68	2	Moderate
ST-193	55	2,788	Residential	67	60	62	67	68	1	None
ST-194	63	3,482	Residential	68	60	63	68	68	1	None
ST-195a	50	534	Residential	68	67	63	68	71	3	Moderate
ST-195	52	741	Residential	60	66	58	63	67	7	Severe
ST-196	48	3,744	Residential	66	58	61	67	66	1	None
ST-197	52	3,336	Residential	57	59	56	62	61	4	Moderate
ST-198	50	1,628	Residential	73	62	65	72	74	0	None
ST-199	40	4,583	Institutional	61	56	63	69	62	1	None
ST-200	38	5,304	Institutional	59	56	62	68	61	2	None
ST-202	39	3,001	Residential	57	58	56	62	61	4	Moderate
ST-203	72	1,654	Residential	69	64	64	69	70	1	Moderate
ST-204	72	3,666	Residential	70	61	64	69	70	0	None

Acronyms:
dBA A-weighted decibel(s)
FRA Federal Rail Authority
HST high-speed train
L_{dn} day-night sound level

Appendix NV **Table 6**

Potential Noise Impacts Long-Term Measurement Sites along the Corcoran Elevated Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
LT-062	33	601	Residential	61	66	59	64	67	6	Severe
LT-063	33	4,680	Residential	68	56	63	68	68	0	None
LT-064	33	230	Residential	81	70	65	75	81	0	Moderate
LT-065	33	252	Residential	78	70	65	75	79	1	Moderate
LT-067	33	398	Residential	65	68	61	66	70	4	Severe
LT-068	33	577	Residential	66	66	61	67	69	3	Moderate
LT-069	33	5,805	Residential	48	55	53	59	55	8	Moderate
LT-070	33	4,308	Residential	51	56	54	60	57	6	Moderate
LT-071	33	256	Residential	73	70	65	72	75	2	Moderate
LT-072	33	3,674	Residential	53	57	54	60	58	6	Moderate
LT-073	33	4,481	Residential	65	56	61	66	66	0	None

Appendix NV **Table 7**
Potential Noise Impacts Short-Term Measurement Sites along the Corcoran Elevated Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
ST-091	33	269	Residential	70	70	64	69	73	3	Severe
ST-092	33	596	Residential	69	66	63	68	70	2	Moderate
ST-093	33	277	Residential	78	69	65	75	79	1	Moderate
ST-094	33	189	Residential	78	71	65	75	79	1	Moderate
ST-095	33	987	Residential	62	63	59	64	66	4	Moderate
ST-097	33	343	Residential	77	69	65	75	77	1	Moderate
ST-099	33	2,726	Residential	58	58	57	62	61	3	Moderate
ST-100	33	3,686	Residential	50	57	53	59	58	8	Moderate

Acronyms:
dBA A-weighted decibel(s)
FRA Federal Rail Authority
L_{dn} day-night sound level

Appendix NV **Table 8**
Potential Noise Impacts Long-Term Measurement Sites along the Corcoran Bypass Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
LT-059	51	677	Residential	65	66	61	66	69	4	Severe
LT-060	43	2,357	Residential	70	60	65	70	71	0	None
LT-061	32	155	Residential	66	72	61	67	73	7	Severe
LT-062	10	2,598	Residential	61	58	59	64	63	2	None
LT-063	9	1,274	Residential	68	62	63	68	69	1	None
LT-064	5	2,964	Residential	81	57	65	75	81	0	None
LT-065	10	2,943	Residential	78	57	65	75	78	0	None
LT-066	12	840	Residential	64	64	60	66	67	3	Moderate
LT-067	12	1,850	Residential	65	60	61	66	67	1	None
LT-068	10	1,325	Residential	64	61	60	66	66	2	Moderate
LT-069	3	2,572	Residential	48	58	53	59	58	11	Moderate
LT-070	10	1,704	Residential	51	60	54	60	61	10	Severe
LT-071	9	1,885	Residential	73	60	65	72	73	0	None
LT-072	3	618	Residential	53	65	54	60	65	13	Severe
LT-073	10	1,599	Residential	84	60	65	75	84	0	None
LT-074	12	5,035	Residential	56	55	56	62	59	3	None
LT-075	12	27	Residential	72	79	65	71	79	8	Severe
LT-076	15	6,392	Residential	73	54	65	71	73	0	None
LT-077	13	5,745	Residential	54	54	55	61	57	3	None
LT-078	15	4,739	Residential	71	55	65	70	71	0	None
LT-079	12	3,634	Residential	58	57	57	62	60	2	None
LT-080	12	4,844	Residential	56	55	56	61	58	3	None

Appendix NV **Table 8**
Potential Noise Impacts Long-Term Measurement Sites along the Corcoran Bypass Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
LT-081	11	1,634	Residential	57	60	56	62	62	5	Moderate
LT-082	12	3,085	Residential	59	57	57	63	61	2	Moderate
LT-083	8	46	Residential	59	79	57	63	79	20	Severe
LT-084	8	2,688	Residential	58	58	57	62	61	3	Moderate
LT-085	8	1,852	Residential	56	60	56	61	61	6	Moderate
LT-086	8	2,275	Residential	65	59	61	66	66	1	None
LT-208	12	7,473	Residential	77	53	65	74	77	0	None

Acronyms:
dBA A-weighted decibel(s)
FRA Federal Rail Authority
L_{dn} day-night sound level

Appendix NV **Table 9**
Potential Noise Impacts Short-Term Measurement Sites along the Corcoran Bypass Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
ST-089	12	2,378	Residential	60	59	58	63	62	3	Moderate
ST-090	25	621	Residential	68	65	63	68	70	2	Moderate
ST-091	3	3,009	Residential	70	57	64	69	70	0	None
ST-092	6	3,980	Residential	69	56	63	68	69	0	None
ST-093	3	3,398	Residential	78	57	65	75	78	0	None
ST-094	8	3,091	Residential	78	57	65	75	78	0	None
ST-095	10	3,707	Residential	62	56	59	64	63	1	None
ST-096	12	2,082	Residential	62	59	59	64	64	2	Moderate
ST-097	10	2,711	Residential	77	58	65	75	77	0	None
ST-098	10	4,271	Residential	63	56	59	65	63	1	None
ST-099	8	118	Residential	58	74	57	62	74	16	Severe
ST-100	10	1,266	Residential	50	62	53	59	62	12	Severe
ST-101	12	6,266	Residential	47	54	53	59	55	8	Moderate
ST-102	11	3,809	Residential	62	56	59	65	63	1	None
ST-103	23	3,200	Residential	59	57	57	63	61	2	None
ST-104	12	3,420	Residential	60	57	58	63	62	2	None
ST-105	11	4,763	Residential	61	55	58	64	62	1	None
ST-106	6	5,473	Residential	61	54	58	64	61	1	None
ST-212	12	8,479	Residential	77	53	65	74	77	0	None

Acronyms:
dBA A-weighted decibel(s)

Appendix NV **Table 9**

Potential Noise Impacts Short-Term Measurement Sites along the Corcoran Bypass Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			

FRA Federal Rail Authority
L_{dn} day-night sound level

Appendix NV **Table 10**
Potential Noise Impacts Long-Term Measurement Sites along the Allensworth Bypass Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
LT-026	32	860	Residential	72	64	65	71	73	1	None
LT-027	33	2,138	Residential	62	60	59	64	64	2	Moderate
LT-028	8	5,918	Residential	67	54	62	68	67	0	None
LT-029	7	7,712	Residential	74	53	65	72	74	0	None
LT-030	7	7,023	Residential	72	53	65	71	72	0	None
LT-044	9	14,865	Residential	66	50	61	67	66	0	None
LT-045	8	13,832	Residential	71	50	61	67	71	0	None
LT-046	8	11,551	Residential	73	51	65	72	73	0	None
LT-047	8	8,895	Residential	60	52	58	63	61	1	None
LT-048	6	10,433	Residential	76	51	65	74	76	0	None
LT-049	6	9,177	Residential	65	52	61	66	65	0	None
LT-050	6	8,796	Residential	62	52	59	64	62	0	None
LT-051	6	8,086	Residential	69	53	63	69	69	0	None
LT-056	9	10,518	Residential	62	51	59	64	62	0	None
LT-057	8	7,491	Residential	59	53	57	63	60	1	None

Acronyms:
dBA A-weighted decibel(s)
FRA Federal Rail Authority
L_{dn} day-night sound level

Appendix NV **Table 11**
Potential Noise Impacts Short-Term Measurement Sites along the Allensworth Bypass Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
ST-041	9	29	Residential	72	81	65	71	82	9	Severe
ST-042	10	2,413	Residential	70	58	64	69	70	0	None
ST-043	32	1,555	Residential	55	61	55	61	62	7	Moderate
ST-044	33	3,364	Residential	55	57	55	61	59	4	Moderate
ST-045	9	7,345	Residential	66	53	64	69	66	0	None
ST-046	9	5,502	Residential	67	54	62	67	67	0	None
ST-047	7	7,835	Residential	70	53	64	69	70	0	None
ST-048	6	8,577	Residential	65	52	61	66	65	0	None
ST-071	9	13,001	Residential	67	50	62	67	67	0	None
ST-072	8	8,557	Residential	65	52	61	66	66	0	None
ST-073	8	10,288	Residential	72	51	65	71	72	0	None
ST-074	9	9,690	Residential	67	52	62	67	67	0	None
ST-075	7	14,679	Residential	65	50	61	66	65	0	None
ST-076	9	10,781	Residential	62	51	59	64	62	0	None
ST-077	6	8,294	Residential	51	52	54	60	55	4	None
ST-078	7	10,440	Residential	66	51	61	67	66	0	None
ST-079	6	8,762	Residential	69	52	63	69	69	0	None
ST-080	5	7,868	Residential	65	53	60	66	65	0	None
ST-081	6	8,060	Residential	71	53	65	70	71	0	None

Appendix NV **Table 11**
Potential Noise Impacts Short-Term Measurement Sites along the Allensworth Bypass Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
ST-082	6	8,461	Residential	65	52	61	66	65	0	None
ST-085	8	6,219	Residential	60	54	58	63	61	1	None
ST-086	8	7,688	Residential	61	53	58	64	62	1	None
ST-087	7	7,534	Residential	70	53	65	70	70	0	None
ST-088	7	4,699	Residential	64	55	60	65	64	1	None

Acronyms:
dBA A-weighted decibel(s)
FRA Federal Rail Authority
L_{dn} day-night sound level

Appendix NV **Table 12**
Potential Noise Impacts Long-Term Measurement Sites along the Wasco-Shafter Bypass Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
LT-009a	6	1,139	Residential	60	62	58	63	64	4	Moderate
LT-009b	5	1,019	Residential	60	62	58	63	64	4	Moderate
LT-009	6	798	Residential	65	64	61	66	68	2	Moderate
LT-010	6	943	Residential	60	63	58	63	65	5	Moderate
LT-011a	73	739	Residential	65	67	60	66	69	5	Severe
LT-011	67	132	Residential	79	71	65	75	79	1	Moderate
LT-012	60	235	Residential	73	70	65	72	75	2	Moderate
LT-013	6	2,202	Residential	74	59	65	73	75	0	None
LT-014	3	2,606	Residential	79	58	65	75	79	0	None
LT-015a	7	6,633	Residential	64	53	60	66	64	0	None
LT-015	7	6,284	Residential	70	54	64	69	70	0	None
LT-016a	9	7,802	Residential	64	53	60	66	64	0	None
LT-016b	8	7,690	Residential	61	53	58	64	62	1	None
LT-016	8	7,435	Residential	75	53	65	73	75	0	None
LT-017	7	8,663	Residential	79	52	65	75	79	0	None
LT-018	7	10,657	Residential	73	51	65	71	73	0	None
LT-019	8	9,683	Residential	73	52	65	72	73	0	None
LT-020	11	7,311	Residential	60	53	58	63	61	1	None
LT-021	11	5,090	Residential	59	55	57	63	60	2	None

Appendix NV **Table 12**
Potential Noise Impacts Long-Term Measurement Sites along the Wasco-Shafter Bypass Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
LT-022	8	6,805	Residential	73	53	65	72	73	0	None
LT-023	8	2,147	Residential	73	59	65	72	74	0	None
LT-024	9	3,009	Residential	63	57	60	65	64	1	None
LT-025	33	1,441	Residential	63	62	59	65	65	2	Moderate
LT-031	3	1,770	Residential	71	60	65	70	71	0	None
LT-032	4	2,622	Residential	64	58	60	66	65	1	None
LT-033	6	1,421	Residential	67	61	62	68	68	1	None
LT-034	5	829	Residential	67	64	62	67	68	2	Moderate
LT-035	8	2,415	Residential	59	58	57	63	62	3	Moderate
LT-036	6	641	Residential	61	65	59	64	66	5	Severe
LT-037	8	2,168	Residential	59	59	57	63	62	3	Moderate
LT-038	7	3,458	Residential	60	57	58	63	61	2	None
LT-039	7	1,440	Residential	69	61	64	69	70	1	None
LT-040	8	4,953	Residential	59	55	57	63	61	1	None
LT-041	8	4,656	Residential	58	55	57	63	60	2	None
LT-042	7	2,172	Residential	62	59	59	64	63	2	Moderate
LT-043	8	239	Residential	54	70	55	61	70	16	Severe
LT-145	6	7,122	Residential	57	53	56	62	59	1	None

Appendix NV **Table 12**
Potential Noise Impacts Long-Term Measurement Sites along the Wasco-Shafter Bypass Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
LT-146	7	1,873	Residential	55	60	55	61	61	6	Moderate
LT-147	68	9,200	Residential	58	56	57	62	60	2	None
LT-148	9	293	Residential	61	69	59	64	70	8	Severe
LT-149	10	581	Residential	55	66	55	61	66	11	Severe

Acronyms:
dBA A-weighted decibel(s)
FRA Federal Rail Authority
L_{dn} day-night sound level

Appendix NV **Table 13**
Potential Noise Impacts Short-Term Measurement Sites along the Wasco-Shafter Bypass Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
ST-014b	5	1,197	Residential	64	62	60	66	66	2	Moderate
ST-016	5	3,786	Institutional	59	56	62	68	61	2	None
ST-017	64	162	Institutional	78	71	70	80	79	1	Moderate
ST-018	69	155	Residential	83	71	65	75	83	0	Moderate
ST-019	3	1,435	Residential	61	61	58	64	64	3	Moderate
ST-020	5	2,628	Residential	67	58	62	68	68	0	None
ST-021	4	3,649	Residential	66	56	61	67	66	0	None
ST-022a	7	6,415	Residential	64	54	60	66	64	0	None
ST-022	6	6,365	Residential	67	54	62	67	67	0	None
ST-023c	7	4,820	Residential	64	55	60	66	65	1	None
ST-023	8	5,614	Residential	70	54	64	69	70	0	None
ST-024	9	4,241	Institutional	68	56	68	73	69	0	None
ST-025	7	7,209	Residential	48	53	53	59	54	6	Moderate
ST-026	8	9,823	Residential	73	52	65	71	73	0	None
ST-027a	8	8,833	Residential	64	52	60	66	64	0	None
ST-027	8	8,275	Residential	73	52	65	71	73	0	None
ST-028a	9	7,415	Residential	64	53	60	66	64	0	None
ST-028	9	7,134	Institutional	71	53	70	75	71	0	None

Appendix NV **Table 13**
Potential Noise Impacts Short-Term Measurement Sites along the Wasco-Shafter Bypass Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
ST-029	7	5,904	Residential	64	54	60	66	65	0	None
ST-030	12	9,821	Residential	69	52	64	69	69	0	None
ST-031	10	9,820	Residential	69	52	63	69	69	0	None
ST-032	9	9,452	Institutional	62	52	64	69	62	0	None
ST-033	8	9,883	Residential	48	52	53	59	53	5	None
ST-034	8	4,680	Residential	71	55	65	70	71	0	None
ST-035	10	4,598	Institutional	69	55	69	74	69	0	None
ST-036	10	6,826	Institutional	67	54	67	72	67	0	None
ST-037	7	5,702	Residential	58	54	57	62	59	2	None
ST-038	8	6,020	Institutional	67	54	67	73	68	0	None
ST-039	8	6,185	Institutional	63	54	65	70	64	1	None
ST-040	9	3,795	Residential	66	56	61	67	66	0	None
ST-049	4	5,332	Residential	45	54	52	59	55	10	Moderate
ST-050	6	7,220	Residential	47	53	53	59	54	7	Moderate
ST-051	8	2,289	Residential	66	59	61	67	67	1	None
ST-052	9	2,363	Residential	50	59	53	60	59	9	Moderate
ST-053	9	1,612	Residential	61	60	59	64	64	3	Moderate
ST-054	8	559	Residential	66	66	62	67	69	3	Moderate
ST-055	9	2,922	Residential	62	57	59	65	63	1	None

Appendix NV **Table 13**
Potential Noise Impacts Short-Term Measurement Sites along the Wasco-Shafter Bypass Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
ST-056	7	1,856	Residential	62	60	59	65	64	2	Moderate
ST-057	8	2,616	Residential	62	58	59	65	64	1	None
ST-058	7	1,931	Residential	62	59	59	65	64	2	Moderate
ST-059	7	1,464	Residential	64	61	60	66	66	2	Moderate
ST-060	7	2,932	Residential	58	57	56	62	60	3	Moderate
ST-061	8	6,319	Residential	53	54	54	60	56	4	None
ST-062	8	5,639	Residential	61	54	59	64	62	1	None
ST-063	9	6,254	Residential	74	54	65	73	74	0	None
ST-064	8	266	Residential	66	70	61	67	71	5	Severe
ST-065	8	4,553	Residential	59	55	57	63	60	2	None
ST-066	7	723	Residential	51	64	54	60	65	13	Severe
ST-067	7	1,886	Residential	62	60	59	64	64	2	Moderate
ST-068	7	3,825	Residential	59	56	57	63	61	2	None
ST-069	7	5,396	Residential	67	54	62	67	67	0	None
ST-070	8	882	Residential	66	63	61	67	68	2	Moderate
ST-141	5	5,473	Residential	54	54	55	61	57	3	None
ST-142	8	124	Residential	68	74	63	68	75	6	Severe
ST-143	8	1,121	Residential	62	62	59	65	65	3	Moderate

Appendix NV **Table 13**

Potential Noise Impacts Short-Term Measurement Sites along the Wasco-Shafter Bypass Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			

Acronyms:
dBA A-weighted decibel(s)
FRA Federal Rail Authority
L_{dn} day-night sound level

Appendix NV **Table 14**
Potential Noise Impacts Long-Term Measurement Sites along the Bakersfield South Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
LT-001	49	364	Residential	65	69	61	66	70	6	Severe
LT-003	63	94	Residential	58	71	57	62	71	14	Severe
LT-004	17	9	Residential	72	63	65	71	72	1	None
LT-005	6	77	Residential	72	76	65	71	77	6	Severe
LT-006	3	59	Residential	74	77	65	72	79	5	Severe
LT-007	3	3	Residential	78	92	65	75	93	15	Severe
LT-008	5	482	Residential	69	66	63	69	71	2	Moderate
LT-159	40	950	Residential	63	64	60	65	67	3	Moderate
LT-187	59	610	Residential	67	67	62	67	70	3	Moderate
LT-188	47	1,366	Residential	70	63	64	69	70	1	None
LT-189	50	2,907	Residential	60	59	58	64	63	2	Moderate
LT-190	56	4,684	Residential	62	58	59	65	64	1	None
LT-191	47	3,528	Residential	69	58	63	68	69	0	None
LT-192	49	1,339	Residential	64	63	60	65	66	3	Moderate
LT-193	49	4,233	Residential	69	57	64	69	69	0	None
LT-194	41	4,214	Residential	65	57	61	66	65	1	None
LT-197	56	1,493	Residential	68	63	63	68	69	1	Moderate
LT-198	60	3,243	Residential	71	60	65	70	72	0	None

Appendix NV **Table 14**
Potential Noise Impacts Long-Term Measurement Sites along the Bakersfield South Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
LT-199	56	2,323	Residential	66	61	61	67	67	1	None
LT-200	41	4,478	Residential	64	57	60	65			

Acronyms:
dBA A-weighted decibel(s)
FRA Federal Rail Authority
L_{dn} day-night sound level

Appendix NV **Table 15**
Potential Noise Impacts Short-Term Measurement Sites along the Bakersfield South Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
ST-001	47	444	Institutional	69	68	69	74	72	2	None
ST-002	55	118	Residential	80	71	65	75	80	1	Moderate
ST-003a	60	1,418	Residential	62	64	59	65	66	4	Moderate
ST-003	62	1,285	Residential	72	64	65	71	73	1	None
ST-004a	60	723	Residential	61	67	58	64	68	7	Severe
ST-004	62	606	Institutional	71	68	70	75	73	2	None
ST-005a	47	1,284	Residential	63	63	59	65	66	3	Moderate
ST-005	49	538	Institutional	68	67	68	73	71	3	None
ST-006	56	635	Institutional	69	67	68	74	71	2	None
ST-007	79	731	Residential	69	68	64	69	71	2	Moderate
ST-008a	82	987	Residential	60	67	58	63	68	8	Severe
ST-008	80	421	Residential	71	69	65	70	73	2	Moderate
ST-008b	82	2,086	Residential	62	64	59	64	66	4	Moderate
ST-009	3	163	Residential	64	72	60	66	73	8	Severe
ST-010	9	261	Residential	69	70	63	69	72	3	Severe
ST-011	14	354	Residential	54	68	55	61	68	14	Severe
ST-012	3	193	Residential	60	71	58	63	71	12	Severe
ST-013	4	576	Residential	76	65	65	74	76	0	Moderate
ST-015	4	326	Residential	78	68	65	75	79	0	Moderate
ST-160	40	681	Residential	63	66	59	65	67	5	Severe

Appendix NV **Table 15**
Potential Noise Impacts Short-Term Measurement Sites along the Bakersfield South Alternative without Mitigation for Design Year 2035

Site	Source Height	Distance to HST Track (feet)	Land Use Type	Existing Noise Level (L_{dn})	Projected HST Noise Level (L_{dn})	Impact Criteria		Total Noise Level (L_{dn})	Noise Level Increase (dBA)	FRA Impact No Mitigation
						Moderate	Severe			
ST-161	40	167	Residential	70	71	65	70	74	3	Severe
ST-164	41	479	Institutional	74	67	70	77	75	1	None
ST-190	56	2,279	Institutional	63	61	65	70	65	2	None
ST-191	64	496	Residential	76	68	65	74	76	1	Moderate
ST-192	64	2,518	Residential	66	61	61	67	67	1	Moderate
ST-193	49	3,235	Residential	67	59	62	67	67	1	None
ST-194	56	3,936	Residential	68	59	63	68	68	1	None
ST-195a	48	168	Residential	68	71	63	68	73	5	Severe
ST-195	47	301	Residential	60	69	58	63	70	10	Severe
ST-196	49	3,572	Residential	66	58	61	67	66	1	None
ST-197	47	3,764	Residential	57	58	56	62	60	4	Moderate
ST-198	47	1,937	Residential	73	61	65	72	74	0	None
ST-199	41	3,804	Institutional	61	57	63	69	62	2	None
ST-200	41	4,459	Institutional	59	57	62	68	61	2	None
ST-202	41	3,987	Residential	57	57	56	62	60	3	Moderate
ST-203	64	1,228	Residential	69	65	64	69	70	1	Moderate
ST-204	64	3,241	Residential	70	60	64	69	70	0	None

Acronyms:
dBA A-weighted decibel(s)
FRA Federal Rail Authority
L_{dn} day-night sound level

Noise and Vibration Mitigation Guidelines

Proposed
California High-Speed Train Project
Noise and Vibration Mitigation Guidelines

3.0 Purpose

The California High-Speed Rail Authority (Authority) and Federal Railroad Administration (FRA) conducted a noise and vibration impact analysis consistent with FRA methods for the proposed California High-Speed Train (HST) System. Adverse noise impacts and vibration impacts are anticipated in several areas along the alternatives. To reduce these potential impacts, mitigation measures such as constructing sound barriers or insulating affected buildings could be implemented. To the extent that mitigation measures are feasible and reasonable, they may be applied at the source, along the alignment, or at the receiving building. Criteria for implementing noise mitigation include balancing effectiveness, physical feasibility, cost, and density and proximity of sensitive receptors.

This memorandum presents the Authority's noise and vibration mitigation guidelines and incorporates by reference the guidelines, definitions, and technical manuals recognized by FRA as being consistent with FRA noise and vibration mitigation requirements. The guidelines are subject to revision.

4.0 Regulatory Requirements

The National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) establish a mandate for federal and state agencies to incorporate environmental protection and enhancement measures into their proposed programs and projects. The FRA encourages noise abatement for HST projects where severe noise impacts are identified by using the methods in the FRA guidance manual (FRA 2005). The guidance manual includes noise criteria and guidelines to determine the need for mitigation. Noise criteria are stated in terms of outdoor exposure to project-related noise compared with existing noise levels. The manual defines three levels of impact: (1) No Impact, (2) Moderate Impact, and (3) Severe Impact. Project-related noise in the No Impact range is not likely annoying and is considered acceptable by FRA without mitigation. Moderate Impact means project-related noise would be noticeable and may result in some complaints from affected sites, but that impacts are not considered significant under CEQA and mitigation would not be required. Project-related noise in the Severe Impact range represents the most compelling need for mitigation and indicates a high level of annoyance from project noise at affected sites; these impacts are considered to be significant in the context of NEPA, Section 106 of the National Historic Preservation Act, and CEQA.

5.0 Noise Mitigation Guidelines

In general, feasible and effective noise mitigation is required when severe or significant impacts are identified. Mitigation guidelines for the three impact categories identified by FRA are as follows:

- No Impact: No mitigation required.
- Moderate Impact: Mitigation not required but may be considered at the discretion of the Authority.
- Severe Impact: Consideration of feasible and effective mitigation is required if impacts cannot be avoided. The Authority will take steps to reduce noise substantially through mitigation measures that are reasonable, physically feasible, practical, and cost-effective.

5.4 Mitigation of Severe Noise Impacts

The Authority has examined different mitigation measures to avoid, minimize, or mitigate severe noise impacts. If severe noise impacts cannot be avoided through project design changes, then the Authority will take steps to reduce severe noise substantially through mitigation measures that are reasonable, physically feasible, practical, and cost-effective.

The following criteria will be used for evaluating the reasonableness of any particular potential noise barrier as mitigation for severe noise impacts:

- Project noise-related increase over existing noise levels.
- Number of noise sensitive sites affected. Generally, at least 10 sites would have to be affected to justify a sound barrier.
- Sound barriers less than 800 feet long generally should not be considered.
- Barrier heights above 14 feet will not be recommended. Mitigation options for areas that require barriers over 14 feet tall will be studied on a case by case basis.
- Is the cost range for the noise barrier within $45,000 (2010 dollars) per benefited residence?
- Does a substantial majority of the community approve of implementation?

Section 4(f) and Section 106 properties with severe or moderate noise impacts may require mitigation, may not be subject to these guidelines, and will be evaluated on a case-by-case basis.

5.4.1 Substantial Noise Reduction

A sound barrier should be constructed only if it would result in a minimum outdoor noise reduction of 5 decibels (dB).

5.4.2 Physically Feasible

Noise mitigation measures must be designed, constructed, installed, or implemented in compliance with structural requirements related to ground conditions, wind loading, seismic risk, safety considerations, accessibility, material maintainability and longevity, and applicable engineering design practices and technology.

Sound barriers are the most common noise mitigation measure. The maximum sound barrier height would be 14 feet for at-grade sections; however, all sound barriers should be designed to be as low as possible to achieve a substantial noise reduction. Berm and berm/wall combinations are the preferred types of sound barriers where space and other environmental constraints permit.

On aerial structures, the maximum sound barrier height would also be 14feet, but barrier material would be limited by engineering weight restrictions for barriers on the structure. Sound barriers on the aerial structure should still be designed to be as low as possible to achieve a substantial noise reduction.

5.4.3 Visual Effects

Sound barriers could consist of solid, semitransparent, and transparent materials. Barriers could have visual effects, depending on their location and height. Sound barriers could be treated to reduce visual impacts.

5.4.4 Cost-Effectiveness

The cost of any particular sound barrier as mitigation cannot exceed $45,000 per benefitted building. This cost is determined by dividing the total cost of the mitigation measure by the number of noise-sensitive buildings that receive a substantial (i.e., 5-dB or greater) outdoor noise reduction. This calculation will generally limit the use of sound barrier mitigation in rural areas that have few and/or isolated residential buildings. If the density of residential dwellings is insufficient to make a sound barrier cost-effective, then other noise abatement measures, such as sound insulation, will be considered on a case-by-case basis. If sound insulation is identified as an alternative mitigation measure, the treatment must provide a substantial increase in noise reduction (i.e., 5 dB [A-weighted scale] or greater) between the outside to inside noise levels for the interior rooms exposed to HST-related noise. If sound insulation is not possible, feasible, or cost-effective, then the Authority will consider other measures, such as purchasing a noise easement.

5.4.5 Reasonable

The above factors will have to be balanced to accomplish a package of noise mitigation measures that are effective but reasonable. Reasonableness implies that good judgment and common sense have been applied during the decision-making process. Reasonableness is determined on the basis of several factors regarding the individual circumstances and the specific needs of affected receivers.

6.0 Vibration Mitigation Guidelines

Reactions to vibration impacts depend on the maximum levels for an average repeated train pass-by event. The frequency of events is a consideration in the FRA vibration impacts criteria. The FRA guidance manual provides vibration criteria. The FRA distinguishes between *frequent* and *infrequent* vibration events, defining frequent as more that 70 vibration or train pass-by events per day.

An HST may operate within close proximity to existing freight or passenger rail trains where ground vibration already may be present. In such cases, the impact of new HST service is assessed as follows:

- Infrequently Freight or Passenger Rail Services: Four or fewer freight and/or passenger trains per day; HST impact is assessed using the FRA vibration criteria.
- Moderate Freight or Passenger Rail Services: If up to 12 freight and/or passenger trains per day and FRA impact criteria are already exceeded, then HST is considered to cause no impact if its vibration is 5 dB lower than the existing freight and passenger rail operations. If not, HST impact is assessed using the FRA vibration criteria.
- Heavy Freight or Passenger Rail Services: If HSTs pass by at less than half as often as freight and passenger trains, then no impact exists unless the HST vibration exceeds the vibration levels of the freight and passenger operations.

Where the HST track is closer to vibration sensitive receivers than an existing rail corridor, impact will be assessed if the existing train vibration levels are increased significantly. A significant increase is 3 vibration dB (VdB) or more.

6.4 Vibration Mitigation

Vibration mitigation will be considered whenever the criterion is exceeded as determined by detailed analysis. If found feasible and reasonable, mitigation measures will be included as part of the HST projects.

6.5 Vibration Guidelines

To the extent they are feasible and reasonable, vibration mitigation measures may be applied at the source, along the path, or at the receiving building. However, the most effective measures are generally those that are applied at the source.

The Authority will use the following cost-benefit criteria to determine the reasonableness of implementing vibration mitigation:

- The minimum length of track mitigated must be determined from calculations based on the FRA detailed analysis methods.
- The vibration mitigation treatment must provide a minimum of 3-VdB reduction for every impacted receiver to be considered effective.
- The Authority will apply the following formula to determine if the mitigation is cost-effective: Length x cost/foot divided by VdB reduction divided by the number of buildings benefitted. If this dollar amount exceeds $45,000, the treatment is not considered to be cost-effective.

The cost-benefit criteria are designed to ensure that vibration mitigation is installed in areas where receivers would benefit significantly but not in areas where they would do little or no good.

7.0 References Cited

Federal Railroad Administration (FRA). 2005. *High-Speed Ground Transportation Noise and Vibration Impact Assessment*. Final report. October.

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Mitigation Measures

Mitigation Measures for Construction Noise and Vibration

Construction noise mitigation measures. Monitor construction noise to verify compliance with the limits. Provide the contractor the flexibility to meet the FTA construction noise limits in the most efficient and cost-effective manner. The contractor would have the flexibility of either prohibiting certain noise-generating activities during nighttime hours or providing additional noise control measures to meet the noise limits. To meet required noise limits, the following noise control mitigation measures will be implemented as necessary, for nighttime and daytime:

- Install a temporary construction site sound barrier near a noise source.
- Avoid nighttime construction in residential neighborhoods.
- Locate stationary construction equipment as far as possible from noise-sensitive sites.
- Re-route construction-related truck traffic along roadways that will cause the least disturbance to residents.
- During nighttime work, use smart back-up alarms, which automatically adjust the alarm level based on the background noise level, or switch off back-up alarms and replace with spotters.
- Use low-noise emission equipment.
- Implement noise-deadening measures for truck loading and operations.
- Monitor and maintain equipment to meet noise limits.
- Line or cover storage bins, conveyors, and chutes with sound-deadening material.
- Use acoustic enclosures, shields, or shrouds for equipment and facilities.
- Use high-grade engine exhaust silencers and engine-casing sound insulation.
- Prohibit aboveground jackhammering and impact pile driving during nighttime hours.
- Minimize the use of generators to power equipment.
- Limit use of public address systems.
- Grade surface irregularities on construction sites.
- Use moveable sound barriers at the source of the construction activity.
- Limit or avoid certain noisy activities during nighttime hours.

To mitigate noise related to pile driving, the use of an augur to install the piles instead of a pile driver would reduce noise levels substantially. If pile driving is necessary, limit the time of day that the activity can occur.

Construction vibration mitigation measures. Building damage from construction vibration is only anticipated from impact pile driving at very close distances to buildings. If piling is more than 25 to 50 feet from buildings, or if alternative methods such as push piling or augur piling can be used, damage from construction vibration is not expected to occur. Other sources of construction vibration do not generate high enough vibration levels for damage to occur. Typically, once a construction scenario has been established, preconstruction surveys are conducted at locations within 50 feet of piling to document the existing condition of buildings in case damage is reported during or after construction. Damaged buildings would be repaired or compensation paid.

Mitigation Measures for Operational Noise and Vibration

Operational Noise Mitigation Measures. Various options exist to address the potentially severe noise effects from HSTs. With input from local jurisdictions and balancing technological factors, such as structural and seismic safety, cost, number of affected receptors, and effectiveness, mitigation measures would be selected and implemented from among the following:

- **Install sound barriers**. Depending on the height and location relative to the tracks, sound barriers can achieve between 5 and 15 dB of noise reduction. The primary requirements for an effective sound barrier are that the barrier must (1) be high enough and long enough to break the line-of-sight between the sound source and the receiver, (2) be of an impervious material with a minimum surface density of 4 pounds per square foot, and (3) not have any gaps or holes between the panels or at the bottom. Because many materials meet these requirements, aesthetics, durability, cost, and maintenance considerations usually determine the selection of materials for sound barriers. Depending on the situation, sound barriers can become visually intrusive. Typically, the sound barriers style is selected with input from the local jurisdiction to reduce the visual effect of barriers on adjacent lands uses. For example, sound barriers could be solid or transparent, of various colors, materials, and surface treatments.

  The maximum sound barrier height would be 14 feet for at-grade sections; however, all sound barriers would be designed to be as low as possible while still achieving a substantial noise reduction. Berm and berm/wall combinations are the preferred types of sound barriers where space and other environmental constraints permit. On aerial structures, the maximum sound barrier height would also be 14 feet, but barrier material would be limited by engineering weight restrictions for barriers on the structure. Sound barriers on the aerial structure should still be designed to be as low as possible while still achieving a substantial noise reduction. Sound barriers on aerial structures and at-grade could consist of solid, semitransparent, and transparent materials.

- **Install building sound insulation**. Sound insulation of residences and institutional buildings to improve the outdoor-to-indoor noise reduction is a mitigation measure that can be provided when the use of sound barriers are not feasible in providing a reasonable level (5 to 7 dB) of noise reduction. Although this approach has no effect on noise in exterior areas, it may be the best choice for sites where sound barriers are not feasible or desirable and for buildings where indoor sensitivity is of most concern. Substantial improvements in building sound insulation (on the order of 5 to 10 dB) can often be achieved by adding an extra layer of glazing to windows, by sealing holes in exterior surfaces that act as sound leaks, and by providing forced ventilation and air conditioning so that windows do not need to be opened. Establish performance criteria to balance existing noise events and ambient roadway noise conditions as factors for determining mitigation measures.

- **Acquire easements on properties severely affected by noise**. Another option for mitigating noise impacts is to acquire easements on residences likely to be impacted by HST operations by paying the homeowners to accept the future noise conditions. This approach is usually taken only in isolated cases where other mitigation options are infeasible, impractical, or too costly.

- **Vehicle noise specification**. In the procurement of an HST vehicle technology, the project can set performance limits for noise levels in order to reduce community noise impacts throughout the corridor. Depending on the available technology, this could significantly reduce the number of impacts throughout the corridor.

- **Special trackwork at crossovers and turnouts**. Because the impacts of HST wheels over rail gaps at turnouts increases HST noise by approximately 6 dB over typical operations, turnouts can be a major source of noise impact. If the turnouts cannot be moved from sensitive areas, the project can use special types of trackwork that eliminate the gap.

- **Heavy maintenance facilities measures**. In order to reduce the noise from the heavy maintenance facility, the follow noise mitigation measures are available:

  – Enclose as many of the maintenance activities within the facility as possible.

- Eliminate windows in the maintenance building that would face toward noise sensitive land uses adjacent to the facility. If windows are required to be located on the side of the facility facing noise-sensitive land uses, they should be the fixed type of windows with a sound transmission class (STC) rating of at least 35. If the windows must of operable design, they should be closed during nighttime maintenance activities.
- Close maintenance facility doors where the rails enter the facility during nighttime maintenance activities.
- Maintenance tracks that cannot be located within the maintenance facility should be located on the far side of the facility from adjacent noise-sensitive receivers.
- For maintenance tracks that cannot be installed away from noise-sensitive receivers, install noise barrier along the maintenance tracks in order to protect the adjacent to noise-sensitive receivers.
- All mechanical equipment (compressors, pumps, generators, etc.) should be located within the maintenance facility structure.
- Any mechanical equipment located exterior to the maintenance facility (compressors, pumps, generators, etc.) should be located on the far side of the facility from adjacent noise-sensitive receivers. If this is not possible, this equipment should be located within noise enclosures to mitigate the noise during operation.
- All ventilation ducting for the maintenance facility should be pointed away from the adjacent noise-sensitive receivers.

Operational Vibration Mitigation Measures

Implement Project Vibration Mitigation. Mitigation for operational vibration impacts can take place at the source, sensitive receiver, or along the propagation path from the source to the sensitive receiver. Measures include:

Vibration Mitigation Procedures and Descriptions

Mitigation Procedure	Location of Mitigation	Description
Location and Design of Special Trackwork	Source	Careful review of crossover and turnout locations during the preliminary engineering stage. When feasible, relocate special trackwork to a less vibration-sensitive area. Installation of spring frogs eliminates gaps at crossovers and helps reduce vibration levels.
Vehicle Suspension	Source	Rail vehicle should have low unsprung weight, soft primary suspension, minimum metal-on-metal contact between moving parts of the truck, and smooth wheels that are perfectly round.
Special Track Support Systems	Source	Floating slabs, resiliently supported ties, high resilience fasteners and ballast mats all help reduce vibration levels from track support system.
Building Modifications	Receiver	For existing buildings, if vibration-sensitive equipment is affected by train vibration, the floor upon which the vibration-sensitive equipment is located could be stiffened and isolated from the remainder of the building. For new buildings, the building foundation should be supported by elastomer pads similar to bridge bearing pads.

Mitigation Procedure	Location of Mitigation	Description
Trenches	Along Vibration Propagation Path	A trench can be an effective vibration barrier if it changes the propagation characteristics of the soil. It can be open or solid. Open trenches can be filled with materials such as styrofoam. Solid barriers can be constructed with sheet piling, rows of drilled shafts filled with either concrete or a mixture of soil and lime, or concrete poured into a trench.
Buffer Zones	Receiver	Negotiate a vibration easement from the affected property owners or expand rail right-of-way.