

Appendix 3.4-A

Noise and Vibration

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

Table of Contents

	Page
Noise Mitigation Guidelines.....	76
Mitigation of Severe Noise Impacts	76
Substantial Noise Reduction.....	76
Reasonable.....	76
Physically Feasible.....	77
Visual Effects.....	77
Cost Effectiveness.....	77
FTA / FRA Construction Noise Mitigation.....	78
FTA / FRA Construction Vibration Mitigation.....	79
Construction Noise and Vibration Mitigation Guidelines.....	80
Construction Vibration Mitigation.....	81

Tables

Table 3.4A-1 Long-Term Existing Noise Measurements	3.4A-1
Table 3.4A-2 Short-Term Existing Noise Measurement and Estimates	3.4A-14
Table 3.4A-3 Existing Vibration Measurements	3.4A-31
Table 3.4A-4 Potential Noise Impacts Long-Term Measurement Sites along the BNSF Alternative without Mitigation for Design Year 2035	3.4A-33
Table 3.4A-5 Potential Noise Impacts Short-Term Measurement Sites along the BNSF Alternative without Mitigation for Design Year 2035	3.4A-40
Table 3.4A-6 Potential Noise Impacts Long-Term Measurement Sites along the Hanford West Bypass 1 Alternative At-Grade without Mitigation for Design Year 2035	3.4A-47
Table 3.4A-7 Potential Noise Impacts Short-Term Measurement Sites along the Hanford West Bypass 1 Alternative At-Grade without Mitigation for Design Year 2035	3.4A-48
Table 3.4A-8 Potential Noise Impacts Long-Term Measurement Sites along the Hanford West Bypass 1 Alternative Below-Grade without Mitigation for Design Year 2035	3.4A-49
Table 3.4A-9 Potential Noise Impacts Short-Term Measurement Sites along the Hanford West Bypass 1 Alternative Below-Grade without Mitigation for Design Year 2035	3.4A-50
Table 3.4A-10	3.4A-51
Potential Noise Impacts Long-Term Measurement Sites along the Hanford West Bypass 1 Alternative Below-Grade Modified without Mitigation for Design Year 2035	3.4A-51
Table 3.4A-11	3.4A-52
Potential Noise Impacts Short-Term Measurement Sites along the Hanford West Bypass 1 Alternative Below-Grade Modified without Mitigation for Design Year 2035	3.4A-52
Table 3.4A-12 Potential Noise Impacts Long-Term Measurement Sites along the Hanford West Bypass 2 Alternative At-Grade without Mitigation for Design Year 2035	3.4A-53
Table 3.4A-13 Potential Noise Impacts Short-Term Measurement Sites along the Hanford West Bypass 2 Alternative At-Grade without Mitigation for Design Year 2035	3.4A-54
Table 3.4A-14 Potential Noise Impacts Long-Term Measurement Sites along the Hanford West Bypass 2 Alternative Below-Grade without Mitigation for Design Year 2035	3.4A-55
Table 3.4A-15 Potential Noise Impacts Short-Term Measurement Sites along the Hanford West Bypass 2 Alternative Below-Grade without Mitigation for Design Year 2035	3.4A-56
Table 3.4A-16 Potential Noise Impacts Long-Term Measurement Sites along the Hanford West Bypass 2 Modified Alternative Below-Grade without Mitigation for Design Year 2035	3.4A-57
Table 3.4A-17 Potential Noise Impacts Short-Term Measurement Sites along the Hanford West Bypass 2 Modified Alternative Below-Grade without Mitigation for Design Year 2035	3.4A-58
Table 3.4A-18 Potential Noise Impacts Long-Term Measurement Sites along the Corcoran Elevated Alternative without Mitigation for Design Year 2035.....	3.4A-59

Table 3.4A-19 Potential Noise Impacts Short-Term Measurement Sites along the Corcoran Elevated Alternative without Mitigation for Design Year 2035..... 3.4A-60

Table 3.4A-20 Potential Noise Impacts Long-Term Measurement Sites along the Corcoran Bypass Alternative without Mitigation for Design Year 2035 3.4A-61

Table 3.4A-21 Potential Noise Impacts Short-Term Measurement Sites along the Corcoran Bypass Alternative without Mitigation for Design Year 2035 3.4A-62

Table 3.4A-22 Potential Noise Impacts Long-Term Measurement Sites along the Allensworth Bypass Alternative without Mitigation for Design Year 2035 3.4A-63

Table 3.4A-23 Potential Noise Impacts Short-Term Measurement Sites along the Allensworth Bypass Alternative without Mitigation for Design Year 2035 3.4A-64

Table 3.4A-24 Potential Noise Impacts Long-Term Measurement Sites along the Wasco-Shafter Bypass Alternative without Mitigation for Design Year 2035 3.4A-65

Table 3.4A-25 Potential Noise Impacts Short-Term Measurement Sites along the Wasco-Shafter Bypass Alternative without Mitigation for Design Year 2035 3.4A-66

Table 3.4A-26 Potential Noise Impacts Long-Term Measurement Sites along the Bakersfield South Alternative without Mitigation for Design Year 2035..... 3.4A-67

Table 3.4A-27 Potential Noise Impacts Short-Term Measurement Sites along the Bakersfield South Alternative without Mitigation for Design Year 2035..... 3.4A-69

Table 3.4A-28 Potential Noise Impacts Long-Term Measurement Sites along the Bakersfield Hybrid Alternative without Mitigation for Design Year 2035..... 3.4A-71

Table 3.4A-29 Potential Noise Impacts Short-Term Measurement Sites along the Bakersfield Hybrid Alternative without Mitigation for Design Year 2035..... 3.4A-73

Table 3.4A-1
 Long-Term Existing Noise Measurements

Site	City/County	Address	Contributing Noise Source	Ldn (dBA)
LT-001	City of Bakersfield	1331 M St	Roadway, Community/Household, Dogs/Birds	64.6
LT-003	City of Bakersfield	9300 Windcreek	Roadway, Aircraft, Community/Household, Dogs/Birds	57.8
LT-004	City of Bakersfield	10304 Palm Ave	Community/Household	71.6
LT-005	City of Bakersfield	1107 Enger St	Community/Household	71.6
LT-006	City of Bakersfield	2800 Lona Dala Dr	Community/Household, Dogs/Birds	74.0
LT-007	City of Bakersfield	3210 Old Farm Rd	Rail, Community/Household, Dogs/Birds	77.7
LT-008	City of Bakersfield	21541 Paddock Place	Rail, Roadway, Community/Household	68.6
LT-009	City of Bakersfield	4340 Sandy Gap	Rail, Roadway, Community/Household	65.1
LT-010	City of Bakersfield	13417 Cheyenne Mtn. Dr	Roadway, Community/Household	59.6
LT-011	City of Bakersfield	19491 Santa Fe	Roadway, Community/Household	78.8
LT-012	City of Bakersfield	19401 Santa Fe	Rail, Roadway, Community/Household	72.8
LT-013	City of Shafter	31396 Burbank	Rail, Grade Crossing, Roadway, Community/Household	74.4
LT-014	City of Shafter	31327 Orange St	Rail, Roadway, Community/Household	79.0
LT-015	City of Shafter	380 Marengo	Rail, Roadway, Community/Household, Dogs/Birds	69.6
LT-016	City of Shafter	396 Prince Lane	Roadway, Community/Household	74.9
LT-017	City of Shafter	17422 Poplar	Rail, Roadway, Community/Household	79.4
LT-018	City of Shafter	17037 Scaroni	Rail, Roadway, Community/Household	72.7
LT-019	City of Wasco	16202 Wasco Ave	Rail, Roadway, Community/Household, Dogs/Birds	72.8
LT-020	City of Wasco	15850 Wasco Ave	Rail, Roadway, Community/Household, Dogs/Birds	59.9

Table 3.4A-1
 Long-Term Existing Noise Measurements

Site	City/County	Address	Contributing Noise Source	Ldn (dBA)
LT-021	City of Wasco	29502 Unnamed Street	Rail, Roadway, Community/Household, Children Playing	58.7
LT-022	City of Wasco	1886 G St	Rail, Community/Household	73.2
LT-023	City of Wasco	29352 Hwy 46 (Paso Robles Hwy)	Roadway, Industrial/Commercial, Community/Household, Children Playing, Dogs/Birds	73.4
LT-024	City of Wasco	29136 McCombs Rd at Annin Ave	Rail, Grade Crossing, Roadway Community/Household	63.0
LT-025	City of Wasco	29351 Whisler Rd	Rail, Roadway, Community/Household	62.7
LT-026	City of Wasco	13436 Hwy 43	Rail, Roadway, Community/Household	72.0
LT-027	City of Wasco	29348 Blankenship	Rail, Roadway, Community/Household	62.1
LT-028	City of Wasco	29350 Peterson	Rail, Roadway, Community/Household	67.2
LT-029	City of Wasco	29305 Second St	Rail, Roadway, Community/Household	73.6
LT-030	City of Wasco	29140 Pond Rd	Rail, Roadway, Community/Household	72.3
LT-031	City of Shafter	13767 Cherry Ave	Rail, Roadway, Community/Household, Dogs/Birds	71.1
LT-032	City of Shafter	1499 E. Los Angeles St	Rail, Grade Crossing, Roadway, Industrial/Commercial, Community/Household	64.4
LT-033	City of Shafter	E. Lerdo Hwy (between S. Beech Ave and Cherry Ave)	Roadway, Community/Household	67.2
LT-034	City of Shafter	1991 E. Lerdo Hwy	Rail, Roadway, Community/Household	66.6
LT-035	City of Shafter	460 Pine St	Roadway, Community/Household	59.4
LT-036	City of Shafter	1450 E. Lerdo Hwy	Rail, Roadway, Industrial/Commercial, Community/Household	61.4
LT-037	City of Shafter	625 E. Fresno Ave	Roadway, Community/Household	58.6

Table 3.4A-1
 Long-Term Existing Noise Measurements

Site	City/County	Address	Contributing Noise Source	Ldn (dBA)
LT-038	City of Shafter	30519 Madera	Community/Household	59.5
LT-039	City of Shafter	17259 Shafter Ave	Roadway, Community/Household	69.2
LT-040	City of Shafter	17207 Mettler Ave	Community/Household	59.1
LT-041	City of Shafter	30348 Madera Ave	Community/Household	58.4
LT-042	City of Shafter	17096 Shafter Ave	Community/Household	61.6
LT-043	City of Shafter	30592 Merced Ave	Community/Household	53.7
LT-044	City of Delano	28901 W. Cecil Way	Roadway, Community/Household	65.6
LT-045	City of Delano	Garces Hwy at Central Valley Hwy	Rail, Grade Crossing, Roadway, Community/Household	71.4
LT-046	City of Delano	11098 Hwy 43 (Central Valley Hwy)	Rail, Roadway, Community/Household	73.1
LT-047	City of Wasco	11248 Airport Ave	Rail, Community/Household	59.9
LT-048	City of Delano	8611 Avenue 32	Roadway, Community/Household	76.1
LT-049	County of Tulare	3400 Road 84, Earlimart	Rail, Roadway, Community/Household	64.5
LT-050	County of Tulare	8512 36th Ave, Earlimart	Rail, Roadway, Community/Household	62.0
LT-051	County of Tulare	8369 Road 84, Earlimart (at Avenue 39)	Rail, Roadway, Community/Household	68.7
LT-052	County of Tulare	9444 Hwy 43	Rail, Roadway, Community/Household	64.4
LT-053	County of Tulare	9582 Hwy 43	Rail, Roadway, Community/Household	64.0
LT-054	County of Tulare	9952 Hwy 43	Rail, Roadway, Community/Household	64.6
LT-055	City of Corcoran	3922 Avenue 120	Rail, Roadway, Industrial/Commercial, Community/Household	65.2

Table 3.4A-1
 Long-Term Existing Noise Measurements

Site	City/County	Address	Contributing Noise Source	Ldn (dBA)
LT-056	City of Delano	28704 Garces	Roadway, Community/Household, Dogs/Birds	61.5
LT-057	City of Delano	11446 Palm Ave	Rail, Community/Household, Dogs/Birds	59.8
LT-058	City of Corcoran	12728 Avenue 128	Rail, Roadway, Community/Household, Dogs/Birds	64.9
LT-059	City of Corcoran	2364 Avenue 144	Rail, Roadway, Community/Household, Dogs/Birds	65.2
LT-060	City of Corcoran	1847 Avenue 144	Rail, Roadway, Community/Household, Dogs/Birds	70.4
LT-061	City of Corcoran	14624 Hwy 43	Rail, Roadway, Community/Household, Dogs/Birds	66.0
LT-062	City of Corcoran	277 Oregon Ave	Rail, Roadway, Industrial/Commercial, Community/Household	61.4
LT-063	City of Corcoran	83 Whitley	Rail, Roadway, Community/Household	68.0
LT-064	City of Corcoran	825 Yoder at Brokaw	Rail, Roadway, Community/Household	80.7
LT-065	City of Corcoran	1420 N. Avenue	Rail, Roadway, Community/Household	78.4
LT-066	City of Corcoran	5904 Newark	Rail, Roadway, Community/Household, Dogs/Birds	64.4
LT-067	City of Corcoran	1940 Dairy Ave	Rail, Roadway, Community/Household	65.5
LT-068	City of Corcoran	5701 Niles	Rail, Roadway, Community/Household	64.1
LT-069	City of Corcoran	172 Orange Dr	Roadway, Community/Household, Dogs/Birds	47.6
LT-070	City of Corcoran	21 5th Ave	Community/Household, Dogs/Birds	51.1
LT-071	City of Corcoran	152 5-1/2 Ave	Roadway, Community/Household, Dogs/Birds	72.9
LT-072	City of Corcoran	455 Orange Ave	Roadway, Community/Household, Dogs/Birds	52.5
LT-073	City of Corcoran	5974 Corcoran Hwy	Roadway, Community/Household	65.4
LT-074	City of Corcoran	23088 5-1/2 Ave	Roadway, Community/Household	55.9

Table 3.4A-1
 Long-Term Existing Noise Measurements

Site	City/County	Address	Contributing Noise Source	Ldn (dBA)
LT-075	City of Corcoran	23489 Hwy 43	Rail, Roadway, Community/Household	71.7
LT-076	City of Hanford	7370 Kansas Ave	Roadway, Community/Household, Dogs/Birds	72.6
LT-077	City of Hanford	7549 Kansas Ave	Roadway, Community/Household	54.3
LT-078	City of Hanford	7685 Kansas Ave	Roadway, Community/Household	71.0
LT-079	City of Hanford	7520 Kent Ave	Roadway, Aircraft, Community/Household, Dogs/Birds	57.8
LT-080	City of Hanford	7290 Kent Ave	Rail, Roadway, Community/Household, Dogs/Birds	55.7
LT-081	City of Hanford	7530 Jersey Ave	Roadway, Community/Household, Dogs/Birds	57.3
LT-082	City of Hanford	15664 7th Ave	Roadway, Community/Household, Dogs/Birds	58.5
LT-083	City of Hanford	7577 Jackson Ave	Roadway, Community/Household	58.9
LT-084	City of Hanford	14976 7th Ave at Jackson	Rail, Roadway, Community/Household	58.0
LT-085	City of Hanford	14419 8th Ave	Roadway, Community/Household	55.5
LT-086	City of Hanford	7025 Idaho St	Roadway, Industrial/Commercial, Community/Household	65.2
LT-087	City of Hanford	7343 Houston	Roadway, Community/Household	67.9
LT-088	City of Hanford	7740 Houston	Roadway, Aircraft, Industrial/Commercial, Community/Household	64.9
LT-089	City of Hanford	7480 Hanford–Armona Rd	Roadway, Aircraft, Community/Household	57.9
LT-090	City of Hanford	7818 Hanford–Armona Rd	Roadway, Aircraft, Community/Household, Dogs/Birds	58.3
LT-091	City of Hanford	10535 8th Ave	Roadway, Aircraft, Community/Household, Dogs/Birds	52.3

Table 3.4A-1
 Long-Term Existing Noise Measurements

Site	City/County	Address	Contributing Noise Source	Ldn (dBA)
LT-092	City of Hanford	9944 Ponderosa	Roadway, Industrial/Commercial, Community/Household, Dogs/Birds	60.2
LT-093	City of Hanford	9724 Ponderosa	Roadway, Aircraft, Community/Household, Dogs/Birds	55.3
LT-094	City of Hanford	7794 Grangeville Blvd	Roadway, Community/Household, Dogs/Birds	56.0
LT-095	City of Hanford	7974 Grangeville Blvd	Roadway, Community/Household	60.4
LT-096	City of Hanford	8791 8th Ave	Roadway, Community/Household	59.5
LT-097	City of Hanford	8361 Flint	Roadway, Aircraft, Industrial/Commercial, Community/Household, Dogs/Birds	55.3
LT-098	City of Hanford	8290 Flint	Roadway, Community/Household	56.0
LT-099	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
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	63.0
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

Table 3.4A-1
 Long-Term Existing Noise Measurements

Site	City/County	Address	Contributing Noise Source	Ldn (dBA)
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	77.0
LT-121	City of Fresno	2625 E. Rose	Rail, Roadway, Community/Household, Dogs/Birds	65.8
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

Table 3.4A-1
 Long-Term Existing Noise Measurements

Site	City/County	Address	Contributing Noise Source	Ldn (dBA)
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	69.0
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
LT-144	City of Fresno	1415 W. McKinley	Rail, Grade Crossing, Roadway, Community/Household	77.3

Table 3.4A-1
 Long-Term Existing Noise Measurements

Site	City/County	Address	Contributing Noise Source	Ldn (dBA)
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	61.0
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

Table 3.4A-1
 Long-Term Existing Noise Measurements

Site	City/County	Address	Contributing Noise Source	Ldn (dBA)
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	61.0
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

Table 3.4A-1
 Long-Term Existing Noise Measurements

Site	City/County	Address	Contributing Noise Source	Ldn (dBA)
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	66.0
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
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	69.0
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

Table 3.4A-1
 Long-Term Existing Noise Measurements

Site	City/County	Address	Contributing Noise Source	Ldn (dBA)
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
LT-211	City of Hanford	10833 Malta St	Rail, Community/Household	67.0
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	74.0
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
LT-218	City of Hanford	5671 Letson Ave	Roadway, Community/Household	61.5
LT-219	City of Hanford	5505 E. Mt. Whitney Ave.	Roadway, Community/Household	62.1
LT-220	City of Hanford	21292 Old Kingston Grade	Roadway, Community/Household	58.6

Table 3.4A-1
 Long-Term Existing Noise Measurements

Site	City/County	Address	Contributing Noise Source	Ldn (dBA)
LT-221	City of Hanford	13422 Elder Ave	Roadway, Community/Household	47.6
LT-222	City of Hanford	8600 13th Street	Roadway, Community/Household	61.2
LT-223	City of Hanford	13314 Grangeville Blvd	Roadway, Community/Household	63.2
LT-224	City of Hanford	12864 13th Ave	Roadway, Community/Household	75.5
LT-225	City of Hanford	11093 13th Ave	Roadway, Community/Household	62.9
LT-226	City of Hanford	12659 Hanford Armona	Roadway, Community/Household	69.3
LT-227	City of Hanford	12629 Hanford Armona	Roadway, Community/Household	56.6
LT-228	City of Hanford	12030 Iona Ave	Roadway, Community/Household	58.6
LT-229	City of Hanford	9930 Kansas Ave	Roadway, Community/Household	70.8
LT-230	City of Bakersfield	806 E. 19 th St.	Roadway, Community/Household	64.4
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) Ldn = day-night sound level LT = long-term				

Table 3.4A-2
 Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured Leq (dBA)	Referenced LT Site	Estimated Ldn (dBA)
ST-001	Bakersfield	Bakersfield High School (14th and F St)	Rail, Roadway, Aircraft, Children Playing, Dogs/Birds	59.5	LT-001	69.0
ST-002	Bakersfield	2215 Truxtun Ave	Rail, Roadway, Aircraft	77.8	LT-001	80.0
ST-003	Bakersfield	Intersection of Myrtle and California	Roadway, Community/Household, Dogs/Birds	71.4	LT-001	72.0
ST-004	Bakersfield	Jastro Park	Roadway, Community/Household	68.7	LT-001	71.0
ST-005	Bakersfield	Beale Memorial Library (701 Truxtun Ave)	Rail, Roadway, Dogs/Birds	57.8	LT-001	68.0
ST-006	Bakersfield	Franklin Elementary School (2400 Truxtun Ave)	Rail, Roadway, Aircraft, Community/Household	65.0	LT-001	69.0
ST-007	Bakersfield	1109 Harvest Creek	Roadway, Aircraft, Community/Household, Dogs/Birds	64.9	LT-003	69.0
ST-008	Bakersfield	8600 Lyn River	Roadway, Aircraft, Community/Household	67.4	LT-003	71.0
ST-009	Bakersfield	Jewetta Ave (Suncrest RV Park)	Rail, Roadway, Community/Household	59.8	LT-006	64.0
ST-010	Bakersfield	2050 Verdugo La	Rail, Roadway, Community/Household, Dogs/Birds	57.0	LT-004	69.0
ST-011	Bakersfield	2001 Dean Ave	Rail, Roadway, Community/Household, Dogs/Birds	55.3	LT-004	54.0
ST-012	Bakersfield	3209 Nebula Court	Rail, Aircraft, Community/Household, Dogs/Birds	58.5	LT-007	60.0
ST-013	Bakersfield	4408 Allen Rd	Rail, Grade Crossing, Roadway, Community/Household, Dogs/Birds	74.7	LT-007	76.0
ST-014a	Bakersfield	14527 Palm Ave	Rail, Grade Crossing, Roadway, Aircraft, Community/Household	53.4	LT-009	66.0

Table 3.4A-2
 Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured Leq (dBA)	Referenced LT Site	Estimated Ldn (dBA)
ST-014b	Bakersfield	14527 Palm Ave	Rail, Grade Crossing, Roadway, Aircraft, Community/Household	49.0	LT-010	64.0
ST-015	Bakersfield	13017 Hageman Frontage Rd	Roadway, Aircraft, Community/Household, Dogs/Birds	65.8	LT-009	78.0
ST-016	Bakersfield	Frontier High School (6401 Allen Rd)	Rail, Grade Crossing, Roadway, Aircraft, Children Playing	43.8	LT-010	59.0
ST-017	Bakersfield	Pentecostal Church of God + house (32186 7th Standard)	Rail, Grade Crossing, Roadway, Community/Household	66.6	LT-011	78.0
ST-018	Bakersfield	19441 Santa Fe Rd	Rail, Grade Crossing, Roadway, Community/Household	71.6	LT-011	83.0
ST-019	Shafter	31363 Orange St	Rail, Grade Crossing, Community/Household, Dogs/Birds	46.7	LT-013	61.0
ST-020	Shafter	18631 Santa Fe Rd	Rail, Grade Crossing, Roadway, Community/Household, Dogs/Birds	52.8	LT-013	67.0
ST-021	Shafter	1240 Los Angeles	Rail, Grade Crossing, Roadway, Community/Household	57.1	LT-015	66.0
ST-022	Shafter	455 E. Ash	Rail, Grade Crossing, Roadway, Community/Household	58.0	LT-015	67.0
ST-023	Shafter	511 Jackson	Rail, Grade Crossing, Roadway, Children Playing	68.3	LT-015	70.0
ST-024	Shafter	Shafter High School (526 Mannel Ave)	Rail, Grade Crossing, Roadway, Children Playing	60.2	LT-015	68.0
ST-025	Wasco	29600 Kimberlina	Rail, Grade Crossing, Community/Household	42.5	LT-018	48.0

Table 3.4A-2
 Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured Leq (dBA)	Referenced LT Site	Estimated Ldn (dBA)
ST-026	Wasco	29895 Merced Ave	Rail, Grade Crossing, Roadway, Community/Household	72.0	LT-018	73.0
ST-027	Wasco	715 Mayer Lane	Rail, Grade Crossing, Roadway, Community/Household, Children Playing, Dogs/Birds	68.1	LT-016	73.0
ST-028	Wasco	Redwood Elementary School (331 Shafter Ave)	Rail, Grade Crossing, Roadway	64.2	LT-016	71.0
ST-029	Wasco	397 Fresno Ave	Roadway, Aircraft, Dogs/Birds	58.0	LT-016	64.0
ST-030	Wasco	Prospect and Hwy 43	Rail, Grade Crossing, Roadway	63.6	LT-019	69.0
ST-031	Wasco	Kimberlina	Rail, Roadway, Dogs/Birds	63.3	LT-019	69.0
ST-032	Wasco	Theresa Burke Elementary School (Filburn and Griffith, Wasco)	Rail, Roadway, Aircraft, Community/Household, Children Playing	56.2	LT-020	62.0
ST-033	Wasco	15848 Griffith Ave	Rail, Roadway, Aircraft, Community/Household, Children Playing, Dogs/Birds	42.7	LT-020	48.0
ST-034	Wasco	4th St at F St	Rail, Roadway, Aircraft, Industrial/Commercial, Children Playing	69.0	LT-023	71.0
ST-035	Wasco	Wasco Child Development Center (764 H St)	Rail, Grade Crossing, Roadway	67.4	LT-023	69.0
ST-036	Wasco	St. Johns School (9th St at Broadway)	Rail, Roadway Community/Household, Children Playing, Dogs/Birds	60.6	LT-023	67.0
ST-037	Wasco	Filburn Ave	Rail, Roadway, Community/Household, Dogs/Birds	38.1	LT-022	58.0

Table 3.4A-2
 Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured Leq (dBA)	Referenced LT Site	Estimated Ldn (dBA)
ST-038	Wasco	Karl F. Clemens Middle School (5th St at Broadway)	Rail, , Roadway, Aircraft, Community/Household, Children Playing, Dogs/Birds	63.3	LT-023	67.0
ST-039	Wasco	Thomas Jefferson Middle School (Griffith at 1st St)	Rail, Roadway, Children Playing, Dogs/Birds	57.9	LT-023	63.0
ST-040	Wasco	Gromer Ave at Annin St	Rail, Grade Crossing, Roadway, Community/Household, Dogs/Birds	60.4	LT-024	66.0
ST-041	Wasco	Hwy 43 at Taussig Ave	Rail, Roadway, Dogs/Birds	64.9	LT-025	72.0
ST-042	Wasco	28994 Taussig Ave	Roadway, Aircraft, Community/Household	62.2	LT-025	70.0
ST-043	Wasco	28998 Blankenship Ave	Rail, Dogs/Birds	49.5	LT-027	55.0
ST-044	Wasco	29398 Blankenship Ave	Rail, Roadway, Community/Household	49.8	LT-027	55.0
ST-045	Wasco	29370 Peterson Rd	Rail, Roadway, Community/Household, Dogs/Birds	60.2	LT-028	66.0
ST-046	Wasco	29380 Elmo near Hwy 43	Roadway	55.5	LT-028	67.0
ST-047	Wasco	29160 Pond Rd	Rail, Roadway, Dogs/Birds	69.0	LT-029	70.0
ST-048	Wasco	11815 Pond Rd, Wasco	Rail, Roadway, Children Playing, Dogs/Birds	58.3	LT-030	65.0
ST-049	Shafter	31793 Riverside St	Roadway, Aircraft, Community/Household, Dogs/Birds	53.6	LT-031	45.0
ST-050	Shafter	18455 Driver Rd	Roadway, Aircraft, Community/Household, Dogs/Birds	55.5	LT-031	47.0

Table 3.4A-2
 Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured Leq (dBA)	Referenced LT Site	Estimated Ldn (dBA)
ST-051	Shafter	Fresno Ave	Rail, Roadway, Community/Household, Children Playing	59.7	LT-035	66.0
ST-052	Shafter	Field at corner of Beech and Canal	Rail, Roadway, Community/Household, Children Playing	43.9	LT-035	50.0
ST-053	Shafter	30998 Fresno Ave	Rail, Aircraft, Community/Household, Dogs/Birds	56.5	LT-034	61.0
ST-054	Shafter	1740 Beech	Roadway, Aircraft, Community/Household, Dogs/Birds	61.6	LT-034	66.0
ST-055	Shafter	350 Pine St	Rail, Roadway, Community/Household, Dogs/Birds	55.4	LT-035	62.0
ST-056	Shafter	1190 Weyand Way at State St	Rail, Aircraft, Dogs/Birds	73.3	LT-035	62.0
ST-057	Shafter	31145 Fresno	Rail, Roadway, Aircraft	52.3	LT-036	62.0
ST-058	Shafter	17431 Mannel Ave	Roadway, Community/Household, Dogs/Birds	52.7	LT-038	62.0
ST-059	Shafter	Mannel Ave	Rail, Roadway, Industrial/Commercial, Community/Household, Dogs/Birds	54.7	LT-038	64.0
ST-060	Shafter	Shafter Ave	Rail, Roadway, Community/Household, Dogs/Birds	57.1	LT-037	58.0
ST-061	Shafter	17413 Mettler	Rail, Roadway, Aircraft, Dogs/Birds	52.4	LT-037	53.0
ST-062	Shafter	155 Redwood Dr	Roadway, Aircraft	54.8	LT-037	61.0
ST-063	Shafter	100 Walker St (Behind Shafter Museum)	Rail, Roadway, Dogs/Birds	67.7	LT-037	74.0
ST-064	Shafter	Merced Ave	Roadway	63.6	LT-037	66.0
ST-065	Shafter	Unknown	Roadway, Children Playing	55.0	LT-037	59.0

Table 3.4A-2
 Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured Leq (dBA)	Referenced LT Site	Estimated Ldn (dBA)
ST-066	Shafter	17052 Shafter Ave	Rail, Roadway, Community/Household	45.0	LT-043	51.0
ST-067	Shafter	Merced Ave	Rail, Roadway, Community/Household, Dogs/Birds	55.3	LT-043	62.0
ST-068	Shafter	30345 Merced Ave	Roadway	60.8	LT-042	59.0
ST-069	Shafter	Merced Ave	Roadway, Aircraft Community/Household, Dogs/Birds	60.2	LT-042	67.0
ST-070	Shafter	30749 Merced	Community/Household	59.1	LT-043	66.0
ST-071	Shafter	29140 Schuster Rd	Rail, Roadway, Community/Household	47.7	LT-047	67.0
ST-072	Wasco	Schuster Rd	Rail, Roadway, Dogs/Birds	60.2	LT-046	65.0
ST-073	Wasco	11242 Hwy 43	Roadway, Children Playing	68.1	LT-046	72.0
ST-074	Wasco	Schuster Rd	Roadway	62.9	LT-046	67.0
ST-075	Wasco	28994 Garces Hwy	Rail, Roadway, Community/Household	60.0	LT-045	65.0
ST-076	Wasco	28820 Garces Hwy	Rail, Roadway, Dogs/Birds	65.9	LT-045	62.0
ST-077	Earlimart	2990 Road 84	Roadway, Aircraft, Community/Household, Children Playing, Dogs/Birds	49.0	LT-048	51.0
ST-078	Earlimart	8830 Avenue 24	Rail, Grade Crossing, Roadway, Dogs/Birds	63.2	LT-048	66.0
ST-079	Earlimart	Avenue 32	Roadway, Aircraft, Dogs/Birds	47.4	LT-049	69.0
ST-080	Earlimart	3442 Road 84	Rail, Roadway, Dogs/Birds	53.7	LT-049	65.0
ST-081	Earlimart	4011 Road 84	Rail, Grade Crossing, Roadway, Industrial/Commercial	64.4	LT-051	71.0
ST-082	Earlimart	3764 Road 84	Rail, Roadway, Community/Household	58.4	LT-051	65.0

Table 3.4A-2
 Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured Leq (dBA)	Referenced LT Site	Estimated Ldn (dBA)
ST-083a	Corcoran	Avenue 108	Rail, Roadway, Community/Household, Dogs/Birds	52.5	LT-054	57.0
ST-083b	Corcoran	Avenue 108	Rail, Roadway, Dogs/Birds	53.4	LT-054	62.0
ST-084	Corcoran	11200 Hwy 43 at Avenue 112	Rail, Grade Crossing, Roadway, Aircraft, Dogs/Birds	47.8	LT-054	62.0
ST-085	Wasco	28794 Shuster Ave, Wasco	Roadway, Community/Household, Dogs/Birds	53.8	LT-057	60.0
ST-086	Wasco	Schuster Rd near Palm Ave	Rail, Roadway, Dogs/Birds	41.8	LT-057	61.0
ST-087	Wasco	28384 Garces Hwy	Roadway, Dogs/Birds	65.3	LT-056	70.0
ST-088	Wasco	11237 Magnolia	Roadway, Industrial/Commercial, Children Playing, Dogs/Birds	58.6	LT-056	64.0
ST-089	Earlimart	3141 Avenue 36	Rail, Grade Crossing, Roadway, Dogs/Birds	41.4	LT-058	60.0
ST-090	Corcoran	14942 Hwy 43	Rail, Roadway, Aircraft	60.7	LT-061	68.0
ST-091	Corcoran	710 Hanna Ave	Rail, Roadway, Community/Household, Dogs/Birds	61.2	LT-064	70.0
ST-092	Corcoran	747 Hall Ave	Rail, Roadway, Industrial/Commercial, Dogs/Birds	59.8	LT-064	69.0
ST-093	Corcoran	1000 Paterson	Rail, Roadway	70.0	LT-065	78.0
ST-094	Corcoran	614 Otis (Kings Mobile Lodge)	Rail, Roadway, Dogs/Birds	70.3	LT-065	78.0
ST-095	Corcoran	Hale St at North Ave	Roadway, Dogs/Birds	60.7	LT-065	62.0
ST-096	Corcoran	6269 Newark Rd	Rail, Roadway, Dogs/Birds	49.3	LT-067	62.0

Table 3.4A-2
 Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured Leq (dBA)	Referenced LT Site	Estimated Ldn (dBA)
ST-097	Corcoran	320 Otis	Rail, Grade Crossing, Roadway, Community/Household, Dogs/Birds	64.5	LT-067	77.0
ST-098	Corcoran	23756 5th Avenue	Roadway, Dogs/Birds	59.4	LT-070a	63.0
ST-099	Corcoran	306 5th Avenue	Rail, Roadway, Community/Household	54.5	LT-070a	58.0
ST-100	Corcoran	5th Avenue at Niles Rd	Roadway	43.4	LT-070	50.0
ST-101	Corcoran	23261 5th Ave	Rail, Roadway, Aircraft, Community/Household, Dogs/Birds	46.9	LT-074	47.0
ST-102	Corcoran	23340 5-1/2 Ave	Rail, Roadway, Community/Household, Dogs/Birds	61.8	LT-074	62.0
ST-103	Hanford	22075 8th Avenue	Roadway, Dogs/Birds	55.7	LT-078	59.0
ST-104	Hanford	7603 Kent Avenue	Rail, Roadway, Aircraft, Community/Household, Dogs/Birds	54.8	LT-079	60.0
ST-105	Hanford	16299 7th Ave	Rail, , Roadway, Aircraft, Community/Household	59.6	LT-081	61.0
ST-106	Hanford	16680 7th Ave	Roadway, Aircraft, Community/Household	59.6	LT-081	61.0
ST-107	Hanford	12051 8th Avenue at Hwy 43	Roadway, Community/Household	57.8	LT-088	59.0
ST-108	Hanford	13320 7th Ave	Roadway, Aircraft, Community/Household, Dogs/Birds	52.2	LT-086	57.0
ST-109	Hanford	13012 7th Ave	Roadway, Aircraft, Dogs/Birds	55.2	LT-086	60.0
ST-110	Hanford	7696 Grangeville Rd	Roadway, Aircraft, Dogs/Birds	52.6	LT-094	60.0
ST-111	Hanford	8229 Flint Ave	Rail, Roadway, Community/Household, Dogs/Birds	55.2	LT-097	59.0

Table 3.4A-2
 Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured Leq (dBA)	Referenced LT Site	Estimated Ldn (dBA)
ST-112	Hanford	7746 Fargo	Roadway, Aircraft, Industrial/Commercial, Dogs/Birds	52.5	LT-100	58.0
ST-113	Hanford	7968 Fargo	Rail, Roadway, Community/Household, Dogs/Birds	51.7	LT-099	56.0
ST-114	Hanford	3295 10th Ave	Roadway	65.4	LT-108	68.0
ST-115	Selma	Clarkson	Rail, Roadway, Dogs/Birds	58.6	LT-113	59.0
ST-115b	Selma	16495 Minnewawa	Rail, Roadway	55.4	LT-113	62.0
ST-116	Selma	14677 South Willow	Rail, Aircraft, Community/Household, Dogs/Birds	53.2	LT-116	59.0
ST-117	Selma	2136 Rose Ave	Rail, Roadway, Aircraft, Community/Household, Dogs/Birds	62.6	LT-124	65.0
ST-118	Fresno	Monroe Elementary School (on Chestnut)	Roadway, Industrial/Commercial, Dogs/Birds	58.7	LT-120	64.0
ST-119	Fresno	12382 Chestnut	Rail, Roadway, Community/Household	56.7	LT-120	62.0
ST-120	Fresno	8254 Cedar	Rail, Roadway, Aircraft, Community/Household, Dogs/Birds	53.6	LT-125	59.0
ST-121	Fresno	Pacific Union Elementary School (Corner of Rowell and Bowles)	Rail, Roadway, Community/Household, Dogs/Birds	55.6	LT-125	61.0
ST-122	Fresno	2419 Manning Ave	Roadway, Community/Household, Dogs/Birds	63.2	LT-124	70.0
ST-123	Fresno	2189 East Morton	Rail, Roadway, Aircraft, Dogs/Birds	65.2	LT-127	61.0
ST-124	Fresno	2120 American	Rail, Roadway, Aircraft, Dogs/Birds	64.1	LT-130	66.0
ST-125	Fresno	2097 Jefferson	Rail, Roadway, Community/Household, Dogs/Birds	66.0	LT-127	62.0

Table 3.4A-2
 Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured Leq (dBA)	Referenced LT Site	Estimated Ldn (dBA)
ST-126	Fresno	4199 Cedar Ave	Roadway, Community/Household, Dogs/Birds	63.6	LT-130	69.0
ST-127	Fresno	2233 Church St	Rail, Roadway, Aircraft, Industrial/Commercial	63.5	LT-133	67.0
ST-128	Fresno	1814 H St	Rail, Roadway, Aircraft	57.1	LT-135	59.0
ST-129	Fresno	Motel Drive at Olive St (Roeding Park)	Rail, Roadway, Dogs/Birds	61.4	LT-139	69.0
ST-130	Fresno	704 Adeline Ave	Rail, Roadway, Community/Household, Dogs/Birds	55.6	LT-137	60.0
ST-131	Fresno	1636 Broadway	Rail, Roadway, Aircraft, Industrial/Commercial, Community/Household	59.7	LT-135	64.0
ST-132	Fresno	660 F St	Rail, Industrial/Commercial, Community/Household	60.0	LT-134	64.0
ST-133	Fresno	852 Divisadero (Iron Bird Lofts)	Rail, Roadway, Aircraft, Industrial/Commercial, Community/Household	55.4	LT-136	61.0
ST-134	Fresno	1383 N. Golden State Blvd (Town House Motel)	Rail, Roadway, Industrial/Commercial	56.2	LT-142	62.0
ST-135	Fresno	1436 University Ave	Roadway, Aircraft, Industrial/Commercial	55.8	LT-144	69.0
ST-136	Fresno	1631 Weldon Ave	Rail Roadway Community/Household Dogs/Birds	54.6	LT-144	58.0
ST-137	Fresno	1224 University	Rail, Roadway	58.2	LT-144	58.0
ST-138	Fresno	1125 West Ave or Northwest Ave	Roadway, Community/Household, Dogs/Birds	56.9	LT-141	67.0

Table 3.4A-2
 Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured Leq (dBA)	Referenced LT Site	Estimated Ldn (dBA)
ST-139	Fresno	Fremont Elementary School (University Ave)	Rail, Roadway, Community/Household, Children Playing	55.8	LT-141	66.0
ST-140	Fresno	530 W. Florida Ave	Rail, Roadway, Community/Household, Dogs/Birds	53.9	LT-140	66.0
ST-141	Shafter	31793 Riverside St	Rail, Roadway, Community/Household, Dogs/Birds	48.1	LT-145	54.0
ST-142	Shafter	16819 N. Shafter Ave	Roadway, Industrial/Commercial, Community/Household	59.2	LT-147	68.0
ST-143	Shafter	29577 Poso Drive	Rail, Roadway, Aircraft, Community/Household, Dogs/Birds	53.0	LT-147	62.0
ST-144	Fresno	Bethel Temple Church (1224 Kern St)	Roadway, Aircraft, Industrial/Commercial, Dogs/Birds	60.9	LT-155	67.0
ST-145	Fresno	Buddhist Temple (1129 Tulane)	Rail, Roadway, Aircraft, Industrial/Commercial, Dogs/Birds	56.9	LT-154	61.0
ST-146	Fresno	La Vena's Educational Center (1015 Fresno St)	Roadway, Industrial/Commercial	68.4	LT-154	71.0
ST-147	Fresno	School ground on Stanislaus St	Rail, Roadway, Community/Household, Children Playing, Dogs/Birds	58.0	LT-152	60.0
ST-148	Fresno	Park at corner of Amador and C St	Roadway, Dogs/Birds	60.1	LT-152	62.0
ST-149	Fresno	Glory Bound Ministries (916 Waterman at Kern St)	Rail, Roadway, Aircraft, Community/Household, Dogs/Birds	58.8	LT-153	61.0
ST-150	Fresno	Boys and Girls Club (930 Tulare St at Mayor)	Rail, Roadway, Aircraft, Community/Household, Dogs/Birds	57.5	LT-152	59.0
ST-151	Fresno	Life Ministries (552 Tuolumne St)	Rail, Roadway, Aircraft, Dogs/Birds	65.2	LT-152	67.0
ST-152	Fresno	1904 McKenzie	Rail, Roadway, Aircraft, Community/Household	67.3	LT-158	74.0

Table 3.4A-2
 Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured Leq (dBA)	Referenced LT Site	Estimated Ldn (dBA)
ST-153	Fresno	472 Calaveras	Rail, Roadway, Industrial/Commercial, Dogs/Birds	59.4	LT-158	66.0
ST-154	Fresno	313 Blackstone	Roadway, Community/Household	61.5	LT-158	63.0
ST-155	Fresno	1225 Divisadero St at Poplar Ave	Rail, Roadway, Aircraft, Industrial/Commercial, Community/Household	62.2	LT-157	66.0
ST-156	Fresno	455 Broadway (Broadmont Apartments)	Roadway, Aircraft, Industrial/Commercial	60.8	LT-157	64.0
ST-157	Fresno	(West of) 282 San Pablo	Rail, Roadway, Aircraft, Community/Household, Dogs/Birds	61.4	LT-157	64.0
ST-158	Bakersfield	1227 Miller St	Rail, Roadway, Aircraft, Community/Household, Dogs/Birds	62.2	LT-161	71.0
ST-159	Bakersfield	Bessie Owens Intermediate School (815 Eureka St at King St)	Rail, Roadway, Dogs/Birds	55.0	LT-160	60.0
ST-160	Bakersfield	400 Chico	Rail, Roadway	56.9	LT-159	63.0
ST-161	Bakersfield	Alpine St	Rail, Roadway, Aircraft, Community/Household	61.7	LT-159	70.0
ST-162	Bakersfield	Grace Christian Center (231 Beale Avenue at Chico)	Roadway, Community/Household, Children Playing, Dogs/Birds	59.3	LT-160	65.0
ST-163	Bakersfield	Unknown	Roadway, Children Playing, Dogs/Birds	54.6	LT-161	60.0
ST-164	Bakersfield	Our Lady of Guadalupe Church (601 E. California Ave)	Roadway, Industrial/Commercial, Dogs/Birds	67.6	LT-164	74.0

Table 3.4A-2
 Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured Leq (dBA)	Referenced LT Site	Estimated Ldn (dBA)
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	59.0	LT-165	63.0
ST-166	Bakersfield	Church (1020 E. California Ave)	Roadway, Aircraft, Dogs/Birds	59.5	LT-165	64.0
ST-167	Bakersfield	Mt. Vernon Elementary School (2162 Potomac Ave)	Roadway, Children Playing, Dogs/Birds	64.1	LT-166	69.0
ST-168	Bakersfield	Corner of Exchange St and Steele Ave	Rail, Roadway, Dogs/Birds	59.7	LT-166	64.0
ST-169	Bakersfield	1241 Ogden	Roadway, Aircraft, Dogs/Birds	60.1	LT-163	71.0
ST-170	Bakersfield	Potomac Park	Rail, Roadway, Community/Household, Dogs/Birds	60.1	LT-167	66.0
ST-171	Bakersfield	Corner of Center St and Tauchen St	Rail, Roadway, Dogs/Birds	63.4	LT-170	69.0
ST-172	Bakersfield	1008 Webster	Aircraft, Dogs/Birds	61.6	LT-170	67.0
ST-173	Bakersfield	2509 E. California	Rail, Roadway, Community/Household, Dogs/Birds	58.4	LT-167	65.0
ST-174	Bakersfield	2523 Steele St	Rail, Roadway, Community/Household, Dogs/Birds	62.7	LT-171	61.0
ST-175	Bakersfield	Lake St	Rail, Roadway	51.3	LT-169	59.0
ST-176	Bakersfield	612 Descano St	Rail, Roadway, Community/Household, Children Playing	59.5	LT-172	62.0
ST-177	Bakersfield	Ramon Garza School (2901 Center St)	Rail, Roadway, Children Playing, Dogs/Birds	68.8	LT-172	71.0
ST-178	Bakersfield	3201 Edison Hwy	Rail, Roadway, Community/Household	72.8	LT-172	75.0
ST-179	Bakersfield	526 Normandy Way (Corner of Normandy and Sterling)	Roadway, Community/Household, Dogs/Birds	62.7	LT-174	74.0

Table 3.4A-2
 Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured Leq (dBA)	Referenced LT Site	Estimated Ldn (dBA)
ST-180	Bakersfield	3815 Edison	Roadway	66.9	LT-174	75.0
ST-181	Bakersfield	Virginia Avenue School (3301 Virginia Ave, Bakersfield)	Roadway, Children Playing	59.3	LT-178	71.0
ST-182	Bakersfield	Unitarian-Universalist Fellowship (Corner of Deacon St and Sterling Rd)	Roadway, Dogs/Birds	54.0	LT-178	66.0
ST-183	Bakersfield	317 Sterling	Rail, Roadway, Industrial/Commercial	61.0	LT-178	73.0
ST-184	Bakersfield	Foothill High School (501 Park Dr, Bakersfield)	Rail, Roadway, Community/Household, Dogs/Birds	52.4	LT-180	58.0
ST-185	Bakersfield	The Church of Jesus Christ of Latter Day Saints (851 Monica St)	Roadway, Dogs/Birds	57.3	LT-181	66.0
ST-186	Bakersfield	300 Royal	Rail, Roadway	61.1	LT-181	66.0
ST-187	Bakersfield	Edison Middle School (721 Edison Rd, Bakersfield)	Roadway	67.1	LT-185	76.0
ST-188	Bakersfield	415 Monica St	Community/Household, Dogs/Birds	54.6	LT-185	64.0
ST-189	Bakersfield	532 Pepper	Rail, Dogs/Birds	60.9	LT-185	70.0
ST-190	Bakersfield	Penn Elementary School (2201 San Emidio St)	Rail, Roadway, Community/Household, Dogs/Birds	53.1	LT-189	63.0
ST-191	Bakersfield	3131 Truxtun Ave—Corner of Oak St and Truxtun Ave	Roadway	71.5	LT-187	76.0
ST-192	Bakersfield	3114 Chester Lane	Roadway, Industrial/Commercial	63.6	LT-190	66.0
ST-193	Bakersfield	Beale Park (Corner of Dracena St and Oleander Ave)	Roadway, Community/Household, Dogs/Birds	57.2	LT-189	67.0

Table 3.4A-2
 Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured Leq (dBA)	Referenced LT Site	Estimated Ldn (dBA)
ST-194	Bakersfield	Church of the Brethren (2471 Palm St at A St)	Roadway, Children Playing	66.1	LT-190	68.0
ST-195	Bakersfield	1608 E St	Rail, Roadway, Aircraft, Community/Household, Dogs/Birds	57.0	LT-187	60.0
ST-196	Bakersfield	Lowell Park (Corner of 4th St and P St)	Roadway, Dogs/Birds	61.2	LT-193	66.0
ST-197	Bakersfield	Beale Park (1980 Palm St)	Roadway, Dogs/Birds	54.2	LT-191	57.0
ST-198	Bakersfield	10th St	Roadway	61.8	LT-192	73.0
ST-199	Bakersfield	Bakersfield Police Activity League (413 East 3rd St (Corner of Marsh and 3rd)	Roadway, Children Playing, Dogs/Birds	57.8	LT-194	61.0
ST-200	Bakersfield	John Fremont School	Roadway, Children Playing, Dogs/Birds	56.7	LT-194	59.0
ST-201	Bakersfield	Trinity Methodist Church (Corner of Niles and King streets	Roadway, Aircraft, Dogs/Birds	61.0	LT-200	63.0
ST-202	Bakersfield	1070 Tulare	Rail, Roadway, Aircraft, Dogs/Birds	55.6	LT-200	57.0
ST-203	Bakersfield	Jastro Park (Corner of Elm St and 18th St)	Roadway, Children Playing, Dogs/Birds	61.0	LT-197	69.0
ST-204	Bakersfield	2330 Elm St	Roadway, Aircraft	69.7	LT-198	70.0
ST-205	Hanford	1158 Northstar Dr	Rail, Community/Household, Dogs/Birds	63.3	LT-204	71.0
ST-206	Hanford	1041 Willow Dr	Rail, Community/Household	55.4	LT-204	69.0
ST-207	Hanford	1052 Minaret Pl	Rail, Community/Household	51.9	LT-204	69.0
ST-208	Hanford	1950 Roland Dr	Roadway, Community/Household	46.6	LT-205	71.0
ST-209	Hanford	10796 Hume Ave	Rail, Community/Household	54.4	LT-211	67.0
ST-210	Hanford	1117 Audubon Rd	Rail, Community/Household	58.1	LT-205	71.0

Table 3.4A-2
 Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured Leq (dBA)	Referenced LT Site	Estimated Ldn (dBA)
ST-211	Hanford	11125 Doris St	Rail, Community/Household	62.8	LT-215	74.0
ST-212	Hanford	10221 Kansas Ave	Rail, Community/Household, Dogs/Birds	61.7	LT-208	77.0
ST-213	Hanford	10870 Thompson Dr	Rail, Community/Household, Dogs/Birds	52.7	LT-211	67.0
ST-214	Hanford	11582 10-1/2 Ave	Roadway, Community/Household	53.6	LT-211	70.0
ST-215	Hanford	19461 S. Sunnyside Ave	Roadway, Community/Household	47.0	LT-218	59.0
ST-216	Hanford	20739 Dennis Ave	Roadway, Community/Household	46.3	LT-219	44.0
ST-217	Hanford	3816 13 1/4 Ave	Roadway, Community/Household	46.1	LT-220	53.0
ST-218	Hanford	13499 Excelsior Ave	Roadway, Community/Household	62.1	LT-221	65.0
ST-219	Hanford	13391 Fargo Ave	Roadway, Community/Household	65.7	LT-222	67.0
ST-220	Hanford	9700 13th Ave	Roadway, Community/Household	63.4	LT-223	66.0
ST-221	Hanford	10282 13th Ave	Roadway, Community/Household	61.7	LT-224	65.0
ST-222	Hanford	10729 13th Ave	Roadway, Community/Household	61.6	LT-224	65.0
ST-223	Hanford	1340 Edgewood Dr	Roadway, Community/Household	61.0	LT-226	63.0
ST-224	Hanford	12726 Houston Ave	Roadway, Community/Household	49.6	LT-227	56.0
ST-225	Hanford	12947 Houston Ave	Roadway, Community/Household	64.5	LT-227	70.0
ST-226	Hanford	2011 Idaho Ave	Roadway, Community/Household	49.6	LT-228	48.0
ST-227	Hanford	16585 11th Ave	Roadway, Community/Household	47.1	LT-229	56.0
ST-228	Hanford	Near 18439 10th Ave	Roadway, Community/Household	52.5	LT-229	64.0
ST-229	Hanford	Near 9846 Lansing Ave	Roadway, Community/Household	55.4	LT-229	67.0
ST-230	Bakersfield	728 E. 19th St.	Roadway, Community/Household	64.0	LT-230	66.0

Table 3.4A-2
 Short-Term Existing Noise Measurement and Estimates

Site	City/County	Address	Contributing Noise Source	Measured Leq (dBA)	Referenced LT Site	Estimated Ldn (dBA)
ST-231	Bakersfield	821 21st St.	Roadway, Community/Household	62.2	LT-230	68.0
ST-232	Bakersfield	918 E. 21st St.	Roadway, Community/Household	57.2	LT-230	64.0
ST-233	Bakersfield	919 E. 21st St.	Roadway, Community/Household	54.6	LT-230	62.0
ST-234	Bakersfield	822 E. 21st St.	Roadway, Community/Household	63.1	LT-230	68.0
ST-235	Bakersfield	921 Sumner St.	Roadway, Community/Household	66.8	LT-230	67.0
ST-236	Bakersfield	1021 Sumner St.	Roadway, Community/Household	67.9	LT-230	75.0
ST-237	Bakersfield	1412 Kentucky St.	Roadway, Community/Household	65.1	LT-230	73.0
ST-238	Bakersfield	1310 Kentucky St.	Roadway, Community/Household	65.7	LT-230	72.0
ST-239	Bakersfield	1222 Kentucky St.	Roadway, Community/Household	68.6	LT-230	74.0

Source: URS/HMM/Arup Joint Venture, Fresno to Bakersfield Noise and Vibration Technical Report (Oakland, CA: URS Corporation, May 2010).
 Note: The Leq (h) and Ldn 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
 Ldn = day-night sound level, dBA
 Leq = equivalent sound level, dBA
 LT = long-term
 ST = short-term

Table 3.4A-3
 Existing Vibration Measurements

Site	Address	Event Descriptions	Distance to Tracks	Measured Maximum (VdB)
V-01	11901 Snowberry Lane, Bakersfield	BNSF Freight EB, BNSF GT EB, BNSF GT WB, BNSF DS EB	65 ft	84, 76, 82, 78
V-02	10430 Glenn St, Green Acres	Amtrak WB, BNSF WB, BNSF EB, Amtrak EB, BNSF WB	92 ft	92, 77, 76, 71, 79
V-03	2500 Jewetta Ave #27, Bakersfield	BNSF WB, Amtrak and BNSF, BNSF, Amtrak (2) w/ MC, BNSF, EB, Amtrak, Amtrak	60 ft	82, 80, 81, 75, 71
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	64, 66, 67, 76
V-05	12013 Compass Ave, Bakersfield	Amtrak WB, BNSF EB, BNSF WB, BNSF WB, Amtrak EB	70 ft	76, 70, 75, 75, 77
V-06	8611 Avenue 32, Earlimart	Amtrak EB 1/4, BNSF EB 4/ / 2, BNSF EB 4/	75 ft	69, 82, 71
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	78, 70, 61
V-08	721 Oswell St, Bakersfield	BNSF–EB Mixed 4/88/2 at 45 mph (72 kph), AMBIENT	93 ft	74, 69
V-09	250 Fairfax Rd, Site 320, Bakersfield Palms RV Park, Bakersfield	UPRR–WB DS /92/1 at 35-45 mph	163 ft	59
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, 86, 95, 88, 96, 78, 83, 80, 81, 85
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	80, 78, 85, 79, 78, 78, 81, 83, 73, 78, 78

Table 3.4A-3
 Existing Vibration Measurements

Site	Address	Event Descriptions	Distance to Tracks	Measured Maximum (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	74, 69, 80, 73, 66
<p>Source: URS/HMM/Arup Joint Venture, Fresno to Bakersfield Noise and Vibration Technical Report (Oakland, CA: URS Corporation, May 2010).</p> <p>Note: x / y / z = number of x locos, y cars, z locos</p> <p>Acronyms:</p> <p>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</p>				

Table 3.4A-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
						Severe	Moderate			
Fresno										
LT-128	3.0	1,218	Residential	65	62	66	61	67	2	Moderate
LT-129	3.0	292	Residential	79	70	75	65	80	0	Moderate
LT-130	3.0	408	Residential	69	68	69	64	71	2	Moderate
LT-132	3.0	317	Residential	75	69	73	65	76	1	Moderate
LT-133	3.0	531	Residential	71	66	70	65	72	1	Moderate
LT-134	3.0	690	Residential	69	65	68	63	70	2	Moderate
LT-150	3.0	972	Residential	61	63	64	58	65	4	Moderate
LT-152	3.0	1,926	Residential	64	60	66	60	66	1	None
LT-154	3.0	1,886	Residential	65	60	66	61	66	1	None
LT-155	3.0	1,992	Residential	63	60	65	59	65	2	Moderate
Monmouth										
LT-117	17.0	469	Residential	65	68	66	60	69	5	Severe
LT-118	17.0	444	Residential	70	68	70	65	72	2	Moderate
LT-119	18.0	727	Residential	68	65	68	63	70	2	Moderate
LT-120	11.0	77	Residential	77	75	75	65	79	2	Severe
LT-121	10.0	175	Residential	66	72	67	61	73	7	Severe
LT-122	15.0	50	Residential	75	74	73	65	78	3	Severe
LT-123	10.0	167	Residential	64	73	66	60	73	9	Severe

Table 3.4A-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
						Severe	Moderate			
LT-124	7.0	231	Residential	70	71	70	65	74	3	Severe
LT-125	10.0	960	Residential	58	64	62	57	65	7	Severe
LT-126	16.0	913	Residential	67	64	67	62	69	2	Moderate
LT-127	13.0	111	Residential	66	74	67	61	75	9	Severe
Hanford										
LT-081	10.0	1,816	Residential	57	60	62	56	62	5	Moderate
LT-083	10.0	95	Residential	59	75	63	57	75	16	Severe
LT-085	10.0	1,770	Residential	56	61	61	56	62	6	Moderate
LT-086	10.0	2,292	Residential	65	59	66	61	66	1	None
LT-087	10.0	620	Residential	68	66	68	63	70	2	Moderate
LT-088	10.0	1,361	Residential	65	62	66	61	67	2	Moderate
LT-089	10.0	185	Residential	58	72	62	57	72	14	Severe
LT-090	10.0	1,797	Residential	58	61	63	57	63	4	Moderate
LT-091	10.0	2,147	Residential	52	60	60	54	60	8	Moderate
LT-092	10.0	90	Residential	60	75	63	58	76	15	Severe
LT-093	10.0	138	Residential	55	74	61	55	74	18	Severe
LT-094	20.0	1,492	Residential	56	63	62	56	64	8	Severe
LT-099	12.0	2,117	Residential	59	60	63	57	62	4	Moderate
LT-100	12.0	1,675	Residential	61	61	64	58	64	3	Moderate

Table 3.4A-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
						Severe	Moderate			
LT-112	7.0	1,849	Residential	64	60	65	60	65	2	Moderate
LT-113	7.0	305	Residential	64	69	65	60	70	7	Severe
LT-114	7.0	245	Residential	66	71	67	62	72	6	Severe
LT-115	10.0	130	Residential	74	74	73	65	77	3	Severe
LT-116	10.0	122	Residential	64	74	65	60	75	11	Severe
Corcoran										
LT-059	21.0	977	Residential	65	65	66	61	68	3	Moderate
LT-060	17.0	1,889	Residential	70	61	70	65	71	0	None
LT-061	14.0	846	Residential	66	64	67	61	68	2	Moderate
LT-062	42.0	789	Residential	61	66	64	59	67	6	Severe
LT-064	35.0	370	Residential	81	69	75	65	81	0	Moderate
LT-065	11.0	89	Residential	78	75	75	65	80	2	Severe
LT-066	10.0	565	Residential	64	66	66	60	68	4	Severe
LT-067	10.0	185	Residential	66	72	67	61	73	7	Severe
LT-068	11.0	609	Residential	64	66	66	60	68	4	Severe
LT-071	11.0	438	Residential	73	68	72	65	74	1	Moderate
LT-075	14.0	412	Residential	72	68	71	65	73	2	Moderate

Table 3.4A-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
						Severe	Moderate			
Pixley										
LT-052	14.0	1,038	Residential	64	63	66	60	67	3	Moderate
LT-053	10.0	776	Residential	64	65	66	60	67	3	Moderate
LT-054	17.0	947	Residential	65	64	66	61	67	3	Moderate
LT-055	12.0	1,630	Residential	65	61	66	61	67	1	Moderate
LT-058	14.0	2,191	Residential	65	60	66	61	66	1	None
Allensworth										
LT-026	9.0	321	Residential	72	69	71	65	74	2	Moderate
LT-027	9.0	1,434	Residential	62	62	65	59	65	3	Moderate
LT-028	9.0	1,097	Residential	67	63	68	62	69	1	Moderate
LT-029	9.0	724	Residential	74	65	72	65	74	1	None
LT-030	9.0	50	Residential	72	77	71	65	78	6	Severe
LT-044	10.0	846	Residential	66	64	67	61	68	2	Moderate
LT-045	14.0	856	Residential	71	64	70	65	72	1	None
LT-046	0.0	464	Residential	73	67	72	65	74	1	Moderate
LT-047	10.0	1,479	Residential	60	61	63	58	64	4	Moderate
LT-048	11.0	259	Residential	76	70	74	65	77	1	Moderate
LT-049	11.0	284	Residential	65	70	66	60	71	7	Severe
LT-050	10.0	247	Residential	62	71	64	59	71	9	Severe
LT-051	10.0	162	Residential	69	73	69	63	74	6	Severe

Table 3.4A-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
						Severe	Moderate			
Wasco-Shafter										
LT-009a	8.0	967	Residential	60	63	63	58	65	5	Severe
LT-009b	8.0	846	Residential	60	64	63	58	66	6	Severe
LT-009	9.0	626	Residential	65	66	66	61	68	3	Moderate
LT-010	8.0	1,114	Residential	60	63	63	58	64	5	Moderate
LT-011a	8.0	566	Residential	65	66	66	60	68	4	Severe
LT-011	8.0	50	Residential	79	78	75	65	81	2	Severe
LT-012	8.0	50	Residential	73	78	72	65	79	6	Severe
LT-013	22.0	50	Residential	74	73	73	65	77	2	Severe
LT-014	44.0	393	Residential	79	69	75	65	79	0	Moderate
LT-015a	44.0	1,026	Residential	64	65	66	60	68	4	Moderate
LT-015	44.0	700	Residential	70	66	69	64	71	2	Moderate
LT-016a	31.0	790	Residential	64	66	66	60	68	4	Severe
LT-016b	31.0	799	Residential	61	66	64	58	67	6	Severe
LT-016	28.0	345	Residential	75	69	73	65	76	1	Moderate
LT-017	10.0	331	Residential	79	69	75	65	80	0	Moderate
LT-018	7.0	416	Residential	73	68	71	65	74	1	Moderate
LT-019	29.0	158	Residential	73	72	72	65	76	3	Severe
LT-020	40.0	688	Residential	60	67	63	58	67	7	Severe
LT-022	39.0	50	Residential	73	68	72	65	74	1	Moderate

Table 3.4A-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
						Severe	Moderate			
LT-023	15.0	1,619	Residential	73	61	72	65	74	0	None
LT-024	9.0	1,157	Residential	63	63	65	60	66	3	Moderate
LT-025	11.0	1,570	Residential	63	61	65	59	65	2	Moderate
LT-031	45.0	1,817	Residential	71	63	70	65	72	1	None
LT-032	38.0	1,737	Residential	64	63	66	60	67	2	Moderate
Bakersfield										
LT-001	53.0	279	Residential	65	70	66	61	71	6	Severe
LT-003	72.0	88	Residential	58	67	62	57	67	9	Severe
LT-004	13.0	50	Residential	72	75	71	65	77	5	Severe
LT-005	10.0	50	Residential	72	76	71	65	77	6	Severe
LT-006	7.0	82	Residential	74	77	72	65	78	4	Severe
LT-007	8.0	52	Residential	78	78	75	65	81	3	Severe
LT-008	9.0	536	Residential	69	67	69	63	71	2	Moderate
LT-159	40.0	124	Residential	63	72	65	60	73	10	Severe
LT-160	46.0	50	Residential	59	66	63	57	67	8	Severe
LT-161	54.0	82	Residential	68	69	68	63	72	3	Severe
LT-162	54.0	886	Residential	58	66	62	57	66	8	Severe
LT-163	59.0	1,600	Residential	66	64	67	62	68	2	Moderate
LT-164	46.0	950	Residential	62	65	64	59	67	5	Severe

Table 3.4A-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
						Severe	Moderate			
LT-165	47.0	1,686	Residential	63	63	65	60	66	3	Moderate
LT-166	65.0	1,220	Residential	61	65	64	58	66	5	Severe
LT-167	86.0	477	Residential	59	68	63	57	68	9	Severe
LT-168	81.0	198	Residential	61	70	64	58	70	9	Severe
LT-169	58.0	595	Residential	66	67	67	62	70	3	Severe
LT-170	72.0	444	Residential	64	68	65	60	69	6	Severe
LT-171	86.0	345	Residential	63	69	65	59	70	7	Severe
LT-172	77.0	311	Residential	57	69	62	56	70	12	Severe
LT-187	66.0	1,055	Residential	67	65	67	62	69	2	Moderate
LT-188	57.0	928	Residential	70	66	69	64	71	1	Moderate
LT-189	61.0	2,455	Residential	61	62	64	58	64	4	Moderate
LT-192	52.0	1,324	Residential	64	64	65	60	67	3	Moderate
LT-197	65.0	1,950	Residential	68	63	68	63	69	1	Moderate

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

Table 3.4A-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
						Severe	Moderate			
Fresno										
ST-124	3.0	646	Residential	66	65	67	62	69	3	Moderate
ST-126	3.0	1,220	Residential	69	62	69	64	70	1	None
ST-127	3.0	544	Residential	67	66	67	62	70	3	Moderate
ST-132	3.0	402	Residential	64	68	65	60	69	6	Severe
ST-144	3.0	1,633	Institutional	67	61	72	67	68	1	None
ST-145	3.0	1,877	Institutional	61	60	69	64	64	2	None
ST-146	3.0	2,415	Institutional	71	59	75	70	71	0	None
Monmouth										
ST-117	15.0	2,234	Residential	65	60	66	61	66	1	None
ST-118	11.0	1,426	Residential	64	62	66	60	66	2	Moderate
ST-119	16.0	711	Residential	62	65	65	59	67	5	Severe
ST-120	10.0	1,156	Residential	59	63	63	57	64	6	Moderate
ST-121b	10.0	386	Residential	67	68	67	62	71	4	Severe
ST-121	10.0	873	Institutional	61	64	69	63	66	5	Moderate
ST-122	15.0	782	Residential	70	65	70	65	71	1	Moderate
ST-123	10.0	170	Residential	61	73	64	58	73	12	Severe
ST-125	10.0	628	Residential	61	66	64	59	67	6	Severe

Table 3.4A-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
						Severe	Moderate			
Hanford										
ST-107	10.0	2,142	Residential	59	60	63	57	62	4	Moderate
ST-108	29.0	2,439	Residential	57	61	62	56	62	5	Moderate
ST-109	25.0	2,375	Residential	60	61	63	58	64	3	Moderate
ST-110	37.0	1,263	Residential	60	64	63	58	65	6	Severe
ST-112	10.0	1,413	Residential	58	62	62	57	63	5	Moderate
ST-115a	7.0	1,516	Residential	59	61	63	57	63	4	Moderate
ST-115b	7.0	840	Residential	62	64	64	59	66	4	Moderate
ST-116	30.0	625	Residential	59	67	63	57	67	9	Severe
Corcoran										
ST-089	10.0	2,439	Residential	60	59	63	58	62	3	Moderate
ST-090	15.0	488	Residential	68	67	68	63	71	3	Moderate
ST-091	41.0	402	Residential	70	69	69	64	72	2	Moderate
ST-092	40.0	475	Residential	69	68	68	63	71	3	Moderate
ST-093	31.0	133	Residential	78	73	75	65	79	1	Moderate
ST-094	17.0	50	Residential	78	73	75	65	80	1	Moderate
ST-095	13.0	826	Residential	62	64	64	59	66	4	Severe
ST-096	14.0	973	Residential	62	64	64	59	66	4	Moderate
ST-097	11.0	169	Residential	77	73	75	65	78	1	Moderate

Table 3.4A-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
						Severe	Moderate			
Pixley										
ST-083	12.0	2,037	Residential	57	60	62	56	62	4	Moderate
Allensworth										
ST-043	10.0	2,329	Residential	55	59	61	55	61	6	Moderate
ST-047	17.0	309	Residential	70	70	69	64	73	3	Severe
ST-048	14.0	982	Residential	65	64	66	61	67	2	Moderate
ST-071	1.0	1,233	Residential	67	62	67	62	68	1	Moderate
ST-072	0.0	582	Residential	65	66	66	61	69	3	Moderate
ST-073	12.0	259	Residential	72	70	71	65	74	2	Moderate
ST-074	10.0	769	Residential	67	65	67	62	69	2	Moderate
ST-075	14.0	1,879	Residential	65	60	66	61	67	1	None
ST-077	11.0	1,954	Residential	51	60	60	54	61	9	Severe
ST-078	13.0	795	Residential	66	65	67	61	68	3	Moderate
ST-079	10.0	1,121	Residential	69	63	69	63	70	1	None
ST-080	10.0	1,432	Residential	65	62	66	60	66	2	Moderate
ST-081	10.0	117	Residential	71	74	70	65	76	5	Severe
ST-082	10.0	148	Residential	65	73	66	61	74	9	Severe
ST-086	11.0	1,944	Residential	61	60	64	58	64	3	Moderate

Table 3.4A-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
						Severe	Moderate			
Wasco-Shafter										
ST-014a	7.0	1,025	Residential	64	63	66	60	67	3	Moderate
ST-014b	7.0	1,025	Residential	64	63	66	60	67	3	Moderate
ST-017	6.0	50	Institutional	78	80	80	70	82	4	Moderate
ST-018	5.0	50	Residential	83	80	75	65	85	2	Severe
ST-019	38.0	1,459	Residential	61	63	64	58	65	4	Moderate
ST-020	28.0	76	Residential	67	74	68	62	75	7	Severe
ST-021	42.0	877	Residential	66	66	67	61	69	3	Moderate
ST-022a	44.0	1,034	Residential	64	65	66	60	67	3	Moderate
ST-022	43.0	1,104	Residential	67	65	67	62	69	2	Moderate
ST-023c	44.0	671	Residential	64	67	66	60	69	5	Severe
ST-023	44.0	103	Residential	70	72	69	64	74	4	Severe
ST-024	44.0	1,845	Institutional	68	63	73	68	69	1	None
ST-026	8.0	314	Residential	73	69	71	65	74	2	Moderate
ST-027a	9.0	934	Residential	64	64	66	60	67	3	Moderate
ST-027	10.0	413	Residential	73	68	71	65	74	1	Moderate
ST-028a	34.0	1,007	Residential	64	65	66	60	67	3	Moderate
ST-028	39.0	826	Institutional	71	66	75	70	72	1	None
ST-029	26.0	1,289	Residential	64	64	66	60	67	3	Moderate
ST-030	34.0	443	Residential	69	68	69	64	72	3	Moderate
ST-031	6.0	504	Residential	69	67	69	63	71	2	Moderate

Table 3.4A-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
						Severe	Moderate			
ST-032	40.0	2,479	Institutional	62	61	69	64	65	3	None
ST-033	39.0	2,189	Residential	48	62	59	53	62	14	Severe
ST-034	28.0	526	Residential	71	68	70	65	73	2	Moderate
ST-035	35.0	355	Institutional	69	69	74	69	72	3	Moderate
ST-036	36.0	1,812	Institutional	67	63	72	67	68	1	None
ST-037	40.0	1,775	Residential	58	63	62	57	64	6	Severe
ST-038	30.0	1,828	Institutional	67	62	73	67	69	1	None
ST-040	13.0	1,119	Residential	66	63	67	61	67	2	Moderate
ST-041	13.0	74	Residential	72	75	71	65	77	4	Severe
ST-042	13.0	2,400	Residential	70	59	69	64	70	0	None
ST-061	9.0	1,688	Residential	53	61	60	54	61	9	Severe
ST-062	31.0	1,099	Residential	61	64	64	59	66	5	Severe
ST-063	37.0	111	Residential	74	73	73	65	76	2	Severe
ST-065	30.0	2,397	Residential	59	61	63	57	63	4	Moderate
Bakersfield										
ST-001	56.0	50	Institutional	69	65	74	69	71	1	None
ST-002	63.0	576	Residential	80	67	75	65	80	0	Moderate
ST-003a	67.0	978	Residential	62	66	65	59	67	5	Severe
ST-003	71.0	850	Residential	72	66	71	65	73	1	Moderate
ST-004a	70.0	1,159	Residential	61	65	64	58	67	5	Severe
ST-004	72.0	1,041	Institutional	71	66	75	70	72	1	None
ST-005a	45.0	855	Residential	63	66	65	59	67	5	Severe

Table 3.4A-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
						Severe	Moderate			
ST-005	49.0	335	Institutional	68	69	73	68	72	4	Moderate
ST-006	65.0	1,089	Institutional	69	65	74	68	70	2	Moderate
ST-007	79.0	496	Residential	69	68	69	64	71	2	Moderate
ST-008a	86	705	Residential	60	67	63	58	67	7	Severe
ST-008	86	156	Residential	71	69	70	65	73	2	Moderate
ST-008b	87	1,795	Residential	62	64	64	59	66	4	Moderate
ST-009	8	234	Residential	64	71	66	60	72	7	Severe
ST-010	15	275	Residential	69	70	69	63	73	4	Severe
ST-011	4	392	Residential	54	68	61	55	68	14	Severe
ST-012	8	225	Residential	60	71	63	58	71	12	Severe
ST-013	5	629	Residential	76	66	74	65	76	0	Moderate
ST-015	5	273	Residential	78	70	75	65	79	1	Moderate
ST-158	53	61	Institutional	71	67	75	70	72	1	None
ST-159	46	217	Institutional	60	71	69	63	71	11	Severe
ST-160	40	84	Residential	63	72	65	59	72	9	Severe
ST-161	40	930	Residential	70	65	70	65	72	1	Moderate
ST-162	47	982	Institutional	65	65	71	66	68	3	None
ST-163	59	1,697	Residential	60	63	63	58	65	5	Severe
ST-164	40	1,357	Institutional	74	64	77	70	74	0	None
ST-165	47	1,580	Institutional	63	63	70	65	66	3	None
ST-166	47	1,256	Institutional	64	64	70	65	67	3	None

Table 3.4A-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
						Severe	Moderate			
ST-167	72	2,300	Institutional	69	63	73	68	70	1	None
ST-168	74	338	Residential	64	69	66	60	70	6	Severe
ST-169	59	802	Residential	71	66	70	65	72	1	Moderate
ST-170	79	970	Residential	66	66	67	62	69	3	Moderate
ST-171	65	654	Residential	69	67	69	64	71	2	Moderate
ST-172	80	500	Residential	67	68	68	62	71	3	Severe
ST-173	84	390	Residential	65	69	66	61	70	5	Severe
ST-174	84	50	Residential	61	63	64	59	65	4	Moderate
ST-175	56	1,267	Residential	59	64	63	57	66	6	Severe
ST-176	81	483	Residential	62	68	64	59	69	7	Severe
ST-177	79	1,488	Residential	71	64	70	65	72	1	None
ST-190	63	1,822	Institutional	63	63	70	65	66	3	None
ST-191	80	912	Residential	76	66	74	65	76	0	Moderate
ST-192	80	2,101	Residential	66	63	67	61	68	2	Moderate
ST-195a	56	532	Residential	68	68	68	63	71	3	Moderate
ST-195	57	741	Residential	60	66	63	58	67	7	Severe
ST-198	55	1,628	Residential	73	63	72	65	74	0	None
ST-203	76	1,654	Residential	69	64	69	64	70	1	Moderate

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

Table 3.4A-6

Potential Noise Impacts Long-Term Measurement Sites along the Hanford West Bypass 1 Alternative At-Grade 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
						Severe	Moderate			
LT-001	282	1578	Residential	62	66	67	61	68	6	Severe
LT-010	230	217	Residential	57	71	60	54	71	14	Severe
LT-011	229	1051	Residential	59	62	65	60	64	5	Moderate
LT-111	264	1911	Residential	57	59	66	60	61	4	Moderate
LT-112	265	1217	Residential	64	61	62	56	66	2	Moderate
LT-113	266	1271	Residential	73	61	62	56	73	0	None
LT-114	268	700	Residential	66	65	70	65	68	2	Moderate
LT-115	267	249	Residential	74	70	67	61	76	2	Moderate
LT-116	275	114	Residential	64	74	68	63	75	11	Severe
LT-117	279	518	Residential	64	66	68	63	68	4	Severe
LT-012	213	1863	Residential	71	59	66	61	71	0	None
LT-002	290	536	Residential	62	70	66	60	71	9	Severe
LT-208	213	1178	Residential	76	62	69	64	76	0	None
LT-003	290	1654	Residential	59	66	66	60	67	8	Severe
LT-004	251	544	Residential	48	66	65	60	66	18	Severe
LT-005	244	1479	Residential	61	60	63	57	64	3	Moderate
LT-006	239	540	Residential	63	66	64	59	68	5	Severe
LT-007	230	365	Residential	76	68	67	61	77	1	Moderate
LT-008	230	1351	Residential	63	61	67	61	65	2	Moderate

Table 3.4A-7

Potential Noise Impacts Short-Term Measurement Sites along the Hanford West Bypass 1 Alternative At-Grade 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
						Severe	Moderate			
ST-001	275	235	Residential	59	72	72	65	73	14	Severe
ST-010	230	1124	Residential	56	62	59	53	63	7	Moderate
ST-011	231	1554	Residential	70	60	64	58	70	0	None
ST-115a	268	459	Residential	59	67	64	59	68	9	Severe
ST-115b	266	1053	Residential	62	62	63	57	65	3	Moderate
ST-116	272	616	Residential	59	65	67	61	66	7	Severe
ST-012	225	159	Residential	48	73	65	60	73	25	Severe
ST-013	215	1389	Residential	56	61	67	61	62	6	Moderate
ST-014	213	278	Residential	64	70	69	64	71	7	Severe
ST-015	212	1462	Residential	67	60	66	60	68	1	None
ST-002	290	2020	Residential	44	65	72	65	65	21	Severe
ST-212	213	407	Residential	76	68	65	60	77	1	Moderate
ST-003	256	768	Residential	53	64	70	65	64	11	Severe
ST-004	254	206	Residential	64	71	74	65	72	8	Severe
ST-005	245	207	Residential	67	71	69	64	73	6	Severe
ST-006	231	147	Residential	66	73	62	56	74	8	Severe
ST-007	231	705	Residential	64	65	74	65	67	3	Moderate
ST-008	231	1077	Residential	65	62	67	62	67	2	Moderate
ST-009	230	2056	Residential	63	58	60	54	64	1	None

Table 3.4A-8

Potential Noise Impacts Long-Term Measurement Sites along the Hanford West Bypass 1 Alternative Below-Grade 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
						Severe	Moderate			
LT-001	282	1578	Residential	62	66	64	59	68	6	Severe
LT-010	197	217	Residential	57	69	62	56	69	12	Severe
LT-011	229	1051	Residential	59	62	63	57	64	5	Moderate
LT-111	264	1911	Residential	57	59	62	56	61	4	Moderate
LT-112	265	1217	Residential	64	61	66	60	66	2	Moderate
LT-113	266	1271	Residential	73	61	72	65	73	0	None
LT-114	268	700	Residential	66	65	67	61	68	2	Moderate
LT-115	267	249	Residential	74	70	72	65	76	2	Moderate
LT-116	275	114	Residential	64	74	66	60	75	11	Severe
LT-117	279	518	Residential	64	66	66	60	68	4	Severe
LT-012	213	1863	Residential	71	59	70	65	71	0	None
LT-002	290	536	Residential	62	70	64	59	71	9	Severe
LT-208	213	1178	Residential	76	62	74	65	76	0	None
LT-003	290	1654	Residential	59	66	63	57	67	8	Severe
LT-004	251	544	Residential	48	66	59	53	66	18	Severe
LT-005	244	1479	Residential	61	60	64	58	64	3	Moderate
LT-006	239	540	Residential	63	66	65	60	68	5	Severe
LT-007	193	365	Residential	76	61	74	65	76	0	None
LT-008	193	1351	Residential	63	54	65	60	63	0	None
LT-009	193	494	Residential	69	59	69	64	69	0	None

Table 3.4A-9

Potential Noise Impacts Short-Term Measurement Sites along the Hanford West Bypass 1 Alternative Below-Grade 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
						Severe	Moderate			
ST-001	275	235	Residential	59	72	63	57	73	14	Severe
ST-010	220	1124	Residential	56	62	62	56	63	7	Moderate
ST-011	231	1554	Residential	70	60	69	64	70	0	None
ST-115a	268	459	Residential	59	67	63	57	68	9	Severe
ST-115b	266	1053	Residential	62	62	64	59	65	3	Moderate
ST-116	272	616	Residential	59	65	63	57	66	7	Severe
ST-012	225	159	Residential	48	73	59	53	73	25	Severe
ST-013	215	1389	Residential	56	61	62	56	62	6	Moderate
ST-014	213	278	Residential	64	70	66	60	71	7	Severe
ST-015	212	1462	Residential	67	60	67	62	68	1	None
ST-002	290	2020	Residential	44	65	59	52	65	21	Severe
ST-212	213	407	Residential	76	68	74	65	77	1	Moderate
ST-003	256	768	Residential	53	64	60	54	64	11	Severe
ST-004	254	206	Residential	64	71	66	60	72	8	Severe
ST-005	245	207	Residential	67	71	67	62	73	6	Severe
ST-006	198	147	Residential	66	74	67	61	74	8	Severe
ST-007	193	705	Residential	64	57	66	60	65	1	None
ST-008	193	1077	Residential	65	55	66	61	65	0	None
ST-009	206	2056	Residential	63	55	65	60	64	1	None

Table 3.4A-10
 Potential Noise Impacts Long-Term Measurement Sites along the Hanford West Bypass 1 Alternative Below-Grade Modified 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
						Severe	Moderate			
LT-001	32	1,590	Residential	62	66	64	59	68	6	Severe
LT-002	41	548	Residential	62	70	64	59	71	9	Severe
LT-003	43	1,666	Residential	59	66	63	57	66	7	Severe
LT-004	9	556	Residential	48	66	59	53	66	18	Severe
LT-005	11	1,913	Residential	61	59	64	58	63	2	Moderate
LT-006	3	78	Residential	63	77	65	60	77	14	Severe
LT-008	-21	1,046	Residential	63	62	65	60	65	2	Moderate
LT-009	-20	813	Residential	69	63	69	64	70	1	None
LT-011	9	1,205	Residential	59	62	63	59	63	4	Moderate
LT-012	11	1,808	Residential	71	59	70	65	71	0	None
LT-111	10	1,923	Residential	57	59	62	56	61	4	Moderate
LT-112	9	1,228	Residential	64	61	66	60	66	2	Moderate
LT-113	8	1,282	Residential	73	61	72	65	73	0	None
LT-114	9	711	Residential	66	65	67	61	68	2	Moderate
LT-115	8	261	Residential	74	70	72	65	76	2	Moderate
LT-116	13	119	Residential	64	74	66	60	75	11	Severe
LT-117	15	522	Residential	64	66	66	60	68	4	Severe
LT-208	11	1,142	Residential	76	62	74	65	76	0	None

Table 3.4A-11

Potential Noise Impacts Short-Term Measurement Sites along the Hanford West Bypass 1 Alternative Below-Grade Modified 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
						Severe	Moderate			
ST-001	26	247	Residential	59	72	63	57	72	13	Severe
ST-002	41	2,032	Residential	44	65	59	52	65	21	Severe
ST-003	8	780	Residential	53	64	60	54	64	11	Severe
ST-004	13	218	Residential	64	71	66	60	72	8	Severe
ST-005	12	404	Residential	67	68	67	62	70	3	Severe
ST-006	-18	576	Residential	66	66	67	61	69	3	Moderate
ST-007	-32	343	Residential	64	65	66	60	68	4	Moderate
ST-008	-35	745	Residential	65	59	66	61	66	1	None
ST-009	-4	2,341	Residential	63	60	65	60	65	2	None
ST-010	5	872	Residential	56	63	62	56	64	8	Severe
ST-011	8	1,329	Residential	70	61	69	64	71	1	None
ST-012	10	91	Residential	48	76	59	53	76	28	Severe
ST-013	10	518	Residential	56	66	62	56	67	11	Severe
ST-014	10	179	Residential	64	72	66	60	73	9	Severe
ST-015	11	1,581	Residential	67	60	67	62	68	1	None
ST-115a	10	465	Residential	59	67	63	57	68	9	Severe
ST-115b	9	1,064	Residential	62	62	63	57	65	3	Moderate
ST-116	10	621	Residential	59	65	64	59	66	7	Severe
ST-212	12	300	Residential	76	69	74	65	77	1	Moderate

Table 3.4A-12

Potential Noise Impacts Long-Term Measurement Sites along the Hanford West Bypass 2 Alternative At-Grade 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
						Severe	Moderate			
LT-001	282	1578	Residential	62	66	64	59	68	6	Severe
LT-010	230	217	Residential	57	71	62	56	71	14	Severe
LT-011	229	1051	Residential	59	62	63	57	64	5	Moderate
LT-111	264	1911	Residential	57	59	62	56	61	4	Moderate
LT-112	265	1217	Residential	64	61	66	60	66	2	Moderate
LT-113	266	1271	Residential	73	61	72	65	73	0	None
LT-114	268	700	Residential	66	65	67	61	68	2	Moderate
LT-115	267	249	Residential	74	70	72	65	76	2	Moderate
LT-116	275	114	Residential	64	74	66	60	75	11	Severe
LT-117	279	518	Residential	64	66	66	60	68	4	Severe
LT-012	234	872	Residential	71	68	70	65	73	2	Moderate
LT-002	290	536	Residential	62	70	64	59	71	9	Severe
LT-208	232	220	Residential	76	73	74	65	78	2	Moderate
LT-003	290	1654	Residential	59	66	63	57	67	8	Severe
LT-004	251	544	Residential	48	66	59	53	66	18	Severe
LT-005	244	1479	Residential	61	60	64	58	64	3	Moderate
LT-006	239	540	Residential	63	66	65	60	68	5	Severe
LT-007	230	365	Residential	76	68	74	65	77	1	Moderate
LT-008	230	1351	Residential	63	61	65	60	65	2	Moderate
LT-009	230	494	Residential	69	67	69	64	71	2	Moderate

Table 3.4A-13

Potential Noise Impacts Short-Term Measurement Sites along the Hanford West Bypass 2 Alternative At-Grade 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
						Severe	Moderate			
ST-001	275	235	Residential	59	72	63	57	73	14	Severe
ST-010	230	1124	Residential	56	62	62	56	63	7	Moderate
ST-011	231	1554	Residential	70	60	69	64	70	0	None
ST-115a	268	459	Residential	59	67	63	57	68	9	Severe
ST-115b	266	1053	Residential	62	62	64	59	65	3	Moderate
ST-116	272	616	Residential	59	65	63	57	66	7	Severe
ST-012	225	159	Residential	48	73	59	53	73	25	Severe
ST-013	221	549	Residential	56	66	62	56	66	10	Severe
ST-014	214	924	Residential	64	63	66	60	67	3	Moderate
ST-015	210	1177	Residential	67	62	67	62	68	1	None
ST-002	290	2020	Residential	44	65	59	52	65	21	Severe
ST-212	237	637	Residential	76	70	74	65	77	1	Moderate
ST-003	256	768	Residential	53	64	60	54	64	11	Severe
ST-004	254	206	Residential	64	71	66	60	72	8	Severe
ST-005	245	207	Residential	67	71	67	62	73	6	Severe
ST-006	231	147	Residential	66	73	67	61	74	8	Severe
ST-007	231	705	Residential	64	65	66	60	67	3	Moderate
ST-008	231	1077	Residential	65	62	66	61	67	2	Moderate
ST-009	230	2056	Residential	63	58	65	60	64	1	None

Table 3.4A-14

Potential Noise Impacts Long-Term Measurement Sites along the Hanford West Bypass 2 Alternative Below-Grade 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
						Severe	Moderate			
LT-001	282	1578	Residential	62	66	64	59	68	6	Severe
LT-010	197	217	Residential	57	69	62	56	69	12	Severe
LT-011	229	1051	Residential	59	62	63	57	64	5	Moderate
LT-111	264	1911	Residential	57	59	62	56	61	4	Moderate
LT-112	265	1217	Residential	64	61	66	60	66	2	Moderate
LT-113	266	1271	Residential	73	61	72	65	73	0	None
LT-114	268	700	Residential	66	65	67	61	68	2	Moderate
LT-115	267	249	Residential	74	70	72	65	76	2	Moderate
LT-116	275	114	Residential	64	74	66	60	75	11	Severe
LT-117	279	518	Residential	64	66	66	60	68	4	Severe
LT-012	234	872	Residential	71	68	70	65	73	2	Moderate
LT-002	290	536	Residential	62	70	64	59	71	9	Severe
LT-208	232	220	Residential	76	73	74	65	78	2	Moderate
LT-003	290	1654	Residential	59	66	63	57	67	8	Severe
LT-004	251	544	Residential	48	66	59	53	66	18	Severe
LT-005	244	1479	Residential	61	60	64	58	64	3	Moderate
LT-006	239	540	Residential	63	66	65	60	68	5	Severe
LT-007	193	365	Residential	76	61	74	65	76	0	None
LT-008	193	1351	Residential	63	54	65	60	63	0	None
LT-009	193	494	Residential	69	59	69	64	69	0	None

Table 3.4A-15

Potential Noise Impacts Short-Term Measurement Sites along the Hanford West Bypass 2 Alternative Below-Grade 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
						Severe	Moderate			
ST-001	275	235	Residential	59	72	63	57	73	14	Severe
ST-010	220	1124	Residential	56	62	62	56	63	7	Moderate
ST-011	231	1554	Residential	70	60	69	64	70	0	None
ST-115a	268	459	Residential	59	67	63	57	68	9	Severe
ST-115b	266	1053	Residential	62	62	64	59	65	3	Moderate
ST-116	272	616	Residential	59	65	63	57	66	7	Severe
ST-012	225	159	Residential	48	73	59	53	73	25	Severe
ST-013	221	549	Residential	56	66	62	56	66	10	Severe
ST-014	214	924	Residential	64	63	66	60	67	3	Moderate
ST-015	210	1177	Residential	67	62	67	62	68	1	None
ST-002	290	2020	Residential	44	65	59	52	65	21	Severe
ST-212	237	637	Residential	76	70	74	65	77	1	Moderate
ST-003	256	768	Residential	53	64	60	54	64	11	Severe
ST-004	254	206	Residential	64	71	66	60	72	8	Severe
ST-005	245	207	Residential	67	71	67	62	73	6	Severe
ST-006	198	147	Residential	66	74	67	61	74	8	Severe
ST-007	193	705	Residential	64	57	66	60	65	1	None
ST-008	193	1077	Residential	65	55	66	61	65	0	None
ST-009	206	2056	Residential	63	55	65	60	64	1	None
ST-001	275	235	Residential	59	72	63	57	73	14	Severe

Table 3.4A-16

Potential Noise Impacts Long-Term Measurement Sites along the Hanford West Bypass 2 Modified Alternative Below-Grade 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
						Severe	Moderate			
LT-001	32	1,590	Residential	62	66	64	59	68	6	Severe
LT-002	41	548	Residential	62	70	64	59	71	9	Severe
LT-003	43	1,666	Residential	59	66	63	57	66	7	Severe
LT-004	9	556	Residential	48	66	59	53	66	18	Severe
LT-005	11	1,913	Residential	61	59	64	58	63	2	Moderate
LT-006	3	78	Residential	63	77	65	60	77	14	Severe
LT-008	-21	1,046	Residential	63	62	65	60	65	2	Moderate
LT-009	-20	813	Residential	69	63	69	64	70	1	None
LT-011	8	1,205	Residential	59	62	63	57	63	4	Moderate
LT-012	13	882	Residential	71	63	70	65	72	1	None
LT-111	10	1,923	Residential	57	59	62	56	61	4	Moderate
LT-112	9	1,228	Residential	64	61	66	60	66	2	Moderate
LT-113	8	1,282	Residential	73	61	72	65	73	0	None
LT-114	9	711	Residential	66	65	67	61	68	2	Moderate
LT-115	8	261	Residential	74	70	72	65	76	2	Moderate
LT-116	13	119	Residential	64	74	66	60	75	11	Severe
LT-117	15	522	Residential	64	66	66	60	68	4	Severe
LT-208	13	230	Residential	76	71	74	65	77	1	Moderate

Table 3.4A-17

Potential Noise Impacts Short-Term Measurement Sites along the Hanford West Bypass 2 Modified Alternative Below-Grade 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
						Severe	Moderate			
ST-001	26	247	Residential	59	72	63	57	72	13	Severe
ST-002	41	2,032	Residential	44	65	59	52	65	21	Severe
ST-003	8	780	Residential	53	64	60	54	64	11	Severe
ST-004	13	218	Residential	64	71	66	60	72	8	Severe
ST-005	12	404	Residential	67	68	67	62	70	3	Severe
ST-006	-18	576	Residential	66	66	67	61	69	3	Moderate
ST-007	-32	343	Residential	64	65	66	60	68	4	Moderate
ST-008	-35	745	Residential	65	59	66	61	66	1	None
ST-009	-4	2,341	Residential	63	60	65	60	65	2	None
ST-010	5	872	Residential	56	63	62	56	64	8	Severe
ST-011	8	1,329	Residential	70	61	69	64	71	1	None
ST-012	11	180	Residential	48	72	59	53	72	24	Severe
ST-013	21	507	Residential	56	66	62	56	67	11	Severe
ST-014	10	930	Residential	64	63	66	60	67	3	Moderate
ST-015	11	1,188	Residential	67	62	67	62	68	1	None
ST-115a	10	465	Residential	59	67	63	57	68	9	Severe
ST-115b	9	1,064	Residential	62	62	64	59	65	3	Moderate
ST-116	10	621	Residential	59	65	63	57	66	7	Severe
ST-212	14	643	Residential	76	65	74	65	76	0	Moderate

Table 3.4A-18

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
						Severe	Moderate			
LT-059	17	983	Residential	65	64	66	61	68	2	Moderate
LT-060	18	1,903	Residential	70	61	70	65	71	0	None
LT-061	19	857	Residential	66	65	67	61	68	2	Moderate
LT-062	49	628	Residential	61	67	64	59	68	7	Severe
LT-064	48	195	Residential	81	71	75	65	81	0	Moderate
LT-065	46	377	Residential	78	69	75	65	79	0	Moderate
LT-066	31	143	Residential	64	73	66	60	73	9	Severe
LT-067	37	590	Residential	66	67	66	61	69	4	Severe
LT-068	46	210	Residential	64	71	66	60	72	8	Severe
LT-071	43	70	Residential	73	70	72	65	75	2	Moderate
LT-075	12	14	Residential	72	75	71	65	77	5	Severe

Table 3.4A-19

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
						Severe	Moderate			
ST-089	10	2,451	Residential	60	59	63	58	62	3	Moderate
ST-090	18	491	Residential	68	67	68	63	71	3	Moderate
ST-091	49	246	Residential	70	70	69	64	73	3	Severe
ST-092	51	609	Residential	69	67	68	63	71	2	Moderate
ST-093	48	325	Residential	78	69	75	65	79	1	Moderate
ST-094	48	282	Residential	78	70	75	65	79	1	Moderate
ST-095	46	1,107	Residential	62	65	64	59	67	5	Severe
ST-096	25	1,402	Residential	62	63	64	59	66	4	Moderate
ST-097	46	505	Residential	77	68	75	65	77	1	Moderate

Acronyms:

dBA A-weighted decibel(s)
 FRA Federal Railroad Administration
 L_{dn} day-night sound level

Table 3.4A-20

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
						Severe	Moderate			
LT-059	42	635	Residential	65	67	66	61	69	4	Severe
LT-060	45	2,402	Residential	70	61	70	65	71	1	None
LT-061	45	150	Residential	66	72	67	61	73	7	Severe
LT-063	14	1,279	Residential	68	62	68	63	69	1	None
LT-066	15	1,035	Residential	64	63	66	60	67	3	Moderate
LT-067	15	2,021	Residential	66	60	66	61	67	1	None
LT-068	15	1,460	Residential	64	62	66	60	66	2	Moderate
LT-070	15	1,679	Residential	51	61	60	54	61	10	Severe
LT-071	15	1,971	Residential	73	60	72	65	73	0	None
LT-072	16	620	Residential	53	66	60	54	66	14	Severe
LT-073	16	1,597	Residential	84	61	75	65	84	0	None
LT-075	14	281	Residential	72	70	71	65	74	2	Moderate

Acronyms:

dBA A-weighted decibel(s)
 FRA Federal Railroad Administration
 L_{dn} day-night sound level

Table 3.4A-21

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
						Severe	Moderate			
ST-089	11	2,457	Residential	60	59	63	58	62	3	Moderate
ST-090	35	582	Residential	68	67	68	63	71	3	Moderate
ST-096	14	2,317	Residential	62	59	64	59	64	2	Moderate
ST-099	16	129	Residential	58	73	62	57	73	15	Severe
ST-100	15	1,227	Residential	50	63	59	53	63	13	Severe

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

Table 3.4A-22

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
						Severe	Moderate			
LT-026	14	908	Residential	72	64	71	65	73	1	None
LT-027	15	2,184	Residential	62	60	65	59	64	2	Moderate
Acronyms: dBA A-weighted decibel(s) FRA Federal Railroad Administration L _{dn} day-night sound level										

Table 3.4A-23

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
						Severe	Moderate			
ST-043	16	1,511	Residential	55	62	61	55	62	7	Severe
Acronyms: dBA A-weighted decibel(s) FRA Federal Railroad Administration L _{dn} day-night sound level										

Table 3.4A-24

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
						Severe	Moderate			
LT-009a	9	967	Residential	60	64	63	58	65	5	Severe
LT-009b	8	846	Residential	60	64	63	58	66	6	Severe
LT-009	9	626	Residential	65	66	66	61	68	3	Moderate
LT-010	8	1,114	Residential	60	63	63	58	64	5	Moderate
LT-011a	48	602	Residential	65	67	66	60	69	4	Severe
LT-011	74	50	Residential	79	64	75	65	79	0	None
LT-012	56	184	Residential	73	71	72	65	75	2	Moderate
LT-013	8	2,203	Residential	74	59	73	65	75	0	None
LT-023	12	2,147	Residential	73	60	72	65	74	0	None
LT-025	44	1,007	Residential	63	65	65	59	67	4	Severe
LT-031	7	1,770	Residential	71	60	70	65	71	0	None
LT-033	7	1,421	Residential	67	62	68	62	68	1	None
LT-034	7	829	Residential	67	64	67	62	69	2	Moderate
LT-035	9	2,415	Residential	59	59	63	57	62	3	Moderate
LT-036	8	641	Residential	61	66	64	59	67	6	Severe
LT-037	10	2,168	Residential	59	60	63	57	62	4	Moderate
LT-039	9	1,440	Residential	69	62	69	64	70	1	None
LT-042	8	2,172	Residential	62	60	64	59	64	2	Moderate
LT-043	8	238	Residential	54	71	61	55	71	17	Severe
LT-146	7	1,873	Residential	55	60	61	55	61	6	Moderate
LT-148	12	31	Residential	61	75	64	59	75	14	Severe
LT-149	10	467	Residential	55	67	61	55	68	12	Severe

Acronyms:

dBA A-weighted decibel(s)
 FRA Federal Railroad Administration
 L_{dn} day-night sound level

Table 3.4A-25

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
						Severe	Moderate			
ST-014a	7	1,025	Residential	64	63	66	60	67	3	Moderate
ST-014b	7	1,025	Residential	64	63	66	60	67	3	Moderate
ST-017	73	50	Institutional	78	64	80	70	78	0	None
ST-018	71	50	Residential	83	64	75	65	83	0	None
ST-019	7	1,435	Residential	61	62	64	58	64	3	Moderate
ST-041	35	102	Residential	72	73	71	65	76	3	Severe
ST-042	35	2,373	Residential	70	61	69	64	70	1	None
ST-051	10	2,289	Residential	66	59	67	61	67	1	None
ST-052	11	2,363	Residential	50	59	60	53	60	10	Moderate
ST-053	11	1,612	Residential	61	61	64	59	64	3	Moderate
ST-054	9	559	Residential	66	66	67	62	69	3	Moderate
ST-056	9	1,856	Residential	62	60	65	59	64	2	Moderate
ST-058	9	1,931	Residential	62	60	65	59	64	2	Moderate
ST-059	9	1,464	Residential	64	61	66	60	66	2	Moderate
ST-064	8	266	Residential	66	70	67	61	71	6	Severe
ST-066	8	723	Residential	51	65	60	54	65	14	Severe
ST-067	8	1,886	Residential	62	60	64	59	64	2	Moderate
ST-070	9	882	Residential	66	64	67	61	68	2	Moderate
ST-142	8	124	Residential	68	74	68	63	75	7	Severe
ST-143	10	1,130	Residential	62	63	65	59	66	3	Moderate

Acronyms:

dBA A-weighted decibel(s)
 FRA Federal Railroad Administration
 L_{dn} day-night sound level

Table 3.4A-26

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
						Severe	Moderate			
LT-001	51	364	Residential	65	69	66	61	70	6	Severe
LT-003	70	131	Residential	58	69	62	57	70	12	Severe
LT-004	16	65	Residential	72	74	71	65	76	4	Severe
LT-005	10	50	Residential	72	76	71	65	77	6	Severe
LT-006	8	82	Residential	74	76	72	65	78	4	Severe
LT-007	8	52	Residential	78	78	75	65	81	3	Severe
LT-008	11	536	Residential	69	67	69	63	71	2	Moderate
LT-159	40	950	Residential	63	65	65	60	67	4	Severe
LT-160	40	1,108	Residential	59	65	63	57	66	6	Severe
LT-161	44	1,554	Residential	68	63	68	63	69	1	Moderate
LT-162	47	592	Residential	58	67	62	57	68	10	Severe
LT-163	56	238	Residential	66	70	67	62	72	6	Severe
LT-164	41	204	Residential	62	71	64	59	72	10	Severe
LT-165	40	378	Residential	63	69	65	60	70	7	Severe
LT-166	67	354	Residential	61	69	64	58	70	9	Severe
LT-167	70	226	Residential	59	70	63	57	70	11	Severe
LT-168	79	99	Residential	61	67	64	58	68	7	Severe
LT-169	61	1,755	Residential	66	63	67	62	68	2	Moderate
LT-170	68	1,124	Residential	64	65	65	60	67	4	Moderate
LT-171	70	663	Residential	63	67	65	59	68	6	Severe
LT-172	75	351	Residential	57	69	62	56	69	12	Severe

Table 3.4A-26

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
						Severe	Moderate			
LT-187	64	610	Residential	67	67	67	62	70	3	Moderate
LT-188	56	1,366	Residential	70	64	69	64	71	1	None
LT-192	50	1,339	Residential	64	64	65	60	67	3	Moderate
LT-197	61	1,493	Residential	68	64	68	63	69	1	Moderate
LT-199	62	2,323	Residential	66	62	67	61	67	2	Moderate

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

Table 3.4A-27

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
						Severe	Moderate			
ST-001	57	444	Institutional	69	68	74	69	72	3	None
ST-002	62	118	Residential	80	70	75	65	80	0	Moderate
ST-003a	65	1,420	Residential	62	64	65	59	66	4	Moderate
ST-003	68	1,285	Residential	72	65	71	65	73	1	None
ST-004a	68	721	Residential	61	67	64	58	68	6	Severe
ST-004	68	606	Institutional	71	67	75	70	73	1	None
ST-005a	47	1,283	Residential	63	64	65	59	66	4	Moderate
ST-005	48	538	Institutional	68	68	73	68	71	3	None
ST-006	63	635	Institutional	69	67	74	68	71	2	None
ST-007	82	762	Residential	69	66	69	64	71	2	Moderate
ST-008a	93	1,012	Residential	60	65	63	58	66	6	Severe
ST-008	87	448	Residential	71	68	70	65	73	2	Moderate
ST-008b	94	2,110	Residential	62	63	64	59	65	4	Moderate
ST-009	8	234	Residential	64	71	66	60	72	7	Severe
ST-010	10	199	Residential	69	72	69	63	74	5	Severe
ST-011	14	296	Residential	54	70	61	55	70	16	Severe
ST-012	9	225	Residential	60	71	63	58	71	12	Severe
ST-013	5	629	Residential	76	66	74	65	76	0	Moderate
ST-015	5	273	Residential	78	70	75	65	79	1	Moderate
ST-158	43	1,402	Institutional	71	64	75	70	72	1	None
ST-159	40	917	Institutional	60	66	69	63	67	6	Moderate
ST-160	40	681	Residential	63	67	65	59	68	5	Severe
ST-161	40	167	Residential	70	72	70	65	74	4	Severe
ST-162	41	203	Institutional	65	71	71	66	72	7	Severe
ST-164	40	479	Institutional	74	68	77	70	75	1	None

Table 3.4A-27

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
						Severe	Moderate			
ST-165	41	360	Institutional	63	69	70	65	70	7	Moderate
ST-166	41	86	Institutional	64	72	70	65	72	9	Severe
ST-167	69	1,517	Institutional	69	64	73	68	70	1	None
ST-168	68	324	Residential	64	69	66	60	70	6	Severe
ST-169	59	434	Residential	71	68	70	65	73	2	Moderate
ST-170	75	911	Residential	66	66	67	62	69	3	Moderate
ST-171	66	1,478	Residential	69	64	69	64	70	1	Moderate
ST-172	70	1,023	Residential	67	65	68	62	70	2	Moderate
ST-173	71	50	Residential	65	64	66	61	68	2	Moderate
ST-174	70	391	Residential	61	69	64	59	69	8	Severe
ST-176	79	578	Residential	62	67	64	59	68	7	Severe
ST-177	75	1,548	Residential	71	64	70	65	72	1	None
ST-190	60	2,279	Institutional	63	62	70	65	66	3	None
ST-191	64	496	Residential	76	68	74	65	76	1	Moderate
ST-195a	47	166	Residential	68	71	68	63	73	5	Severe
ST-195	56	301	Residential	60	70	63	58	70	10	Severe
ST-198	54	1,937	Residential	73	63	72	65	74	0	None
ST-203	63	1,228	Residential	69	65	69	64	70	1	Moderate

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

Table 3.4A-28

Potential Noise Impacts Long-Term Measurement Sites along the Bakersfield Hybrid 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
						Severe	Moderate			
LT-001	41	149	Residential	65	60	66	61	66	1	None
LT-003	69	131	Residential	58	70	62	57	70	12	Severe
LT-004	17	65	Residential	72	76	71	65	78	6	Severe
LT-005	9	50	Residential	72	79	71	65	80	9	Severe
LT-006	7	82	Residential	74	79	72	65	80	6	Severe
LT-007	8	52	Residential	78	80	75	65	82	5	Severe
LT-008	9	536	Residential	69	69	69	63	72	3	Severe
LT-159	43	50	Residential	63	59	65	60	65	1	None
LT-160	41	291	Residential	59	62	63	57	64	5	Moderate
LT-161	42	353	Residential	68	62	68	63	69	1	None
LT-162	45	1,303	Residential	58	58	62	57	61	3	Moderate
LT-163	54	1,842	Residential	66	57	67	62	67	1	None
LT-164	41	1,239	Residential	62	58	64	59	63	1	None
LT-165	41	2,043	Residential	63	56	65	60	64	1	None
LT-166	68	1,230	Residential	61	61	64	58	64	3	Moderate
LT-167	77	477	Residential	59	64	63	57	65	6	Severe
LT-168	77	198	Residential	61	67	64	58	68	6	Severe
LT-169	58	479	Residential	66	61	67	62	68	1	None
LT-170	70	442	Residential	64	63	65	60	66	3	Moderate
LT-171	76	345	Residential	63	65	65	59	67	4	Severe
LT-172	75	311	Residential	57	67	62	56	67	10	Severe
LT-187	66	610	Residential	67	61	67	62	68	1	None

Table 3.4A-28

Potential Noise Impacts Long-Term Measurement Sites along the Bakersfield Hybrid 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
						Severe	Moderate			
LT-188	58	1,283	Residential	70	58	69	64	70	0	None
LT-189	62	2,456	Residential	61	57	64	58	62	2	None
LT-192	56	1,164	Residential	64	58	65	60	65	1	None
LT-197	59	1,496	Residential	68	58	68	63	68	0	None
LT-199	64	2,324	Residential	66	58	67	61	66	1	None
LT-230	41	453	Residential	64	61	66	60	66	2	Moderate

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

Table 3.4A-29

Potential Noise Impacts Short-Term Measurement Sites along the Bakersfield Hybrid 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
						Severe	Moderate			
ST-001	57	344	Institutional	69	60	74	69	70	1	None
ST-002	63	125	Residential	80	61	75	65	80	0	None
ST-003	66	1,285	Residential	72	60	71	65	72	0	None
ST-003a	65	1,420	Residential	62	59	65	59	64	2	Moderate
ST-004	66	606	Institutional	71	61	75	70	72	0	None
ST-004a	66	721	Residential	61	61	64	58	64	3	Moderate
ST-005	56	475	Institutional	68	59	73	68	68	1	None
ST-005a	51	884	Residential	63	59	65	59	64	1	None
ST-006	63	636	Institutional	69	61	74	68	69	1	None
ST-007	84	762	Residential	69	66	69	64	71	2	Moderate
ST-008	87	448	Residential	71	68	70	65	73	2	Moderate
ST-008a	94	1,012	Residential	60	65	63	58	66	6	Severe
ST-008b	95	2,110	Residential	62	63	64	59	65	4	Moderate
ST-009	8	234	Residential	64	73	66	60	74	10	Severe
ST-010	8	199	Residential	69	74	69	63	75	7	Severe
ST-011	15	296	Residential	54	72	61	55	73	18	Severe
ST-012	12	225	Residential	60	74	63	58	74	14	Severe
ST-013	5	629	Residential	76	68	74	65	76	1	Moderate
ST-015	5	273	Residential	78	73	75	65	79	1	Moderate
ST-158	41	497	Institutional	71	61	75	70	71	0	None
ST-159	41	505	Institutional	60	61	69	63	64	3	None

Table 3.4A-29

Potential Noise Impacts Short-Term Measurement Sites along the Bakersfield Hybrid 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
						Severe	Moderate			
ST-160	43	202	Residential	63	62	65	59	66	3	Moderate
ST-161	43	1,037	Residential	70	58	70	65	71	0	None
ST-162	41	1,286	Institutional	65	58	71	66	66	1	None
ST-163	48	1,359	Residential	60	58	63	58	62	2	Moderate
ST-164	42	1,513	Institutional	74	57	77	70	74	0	None
ST-165	41	1,894	Institutional	63	56	70	65	64	1	None
ST-166	41	1,636	Institutional	64	57	70	65	65	1	None
ST-167	69	2,302	Institutional	69	59	73	68	69	0	None
ST-168	71	338	Residential	64	64	66	60	67	3	Moderate
ST-169	56	944	Residential	71	60	70	65	71	0	None
ST-170	75	970	Residential	66	64	67	62	68	2	Moderate
ST-171	65	640	Residential	69	62	69	64	70	1	None
ST-172	73	500	Residential	67	63	68	62	69	1	Moderate
ST-173	75	390	Residential	65	64	66	61	68	2	Moderate
ST-174	77	50	Residential	61	59	64	59	63	2	Moderate
ST-175	48	971	Residential	59	59	63	57	62	3	Moderate
ST-176	76	483	Residential	62	65	64	59	67	5	Severe
ST-177	76	1,488	Residential	71	63	70	65	72	1	None
ST-190	64	2,276	Institutional	63	58	70	65	64	1	None
ST-191	65	496	Residential	76	62	74	65	76	0	None
ST-195	65	2,073	Residential	66	59	67	61	67	1	None
ST-195a	58	369	Residential	60	60	63	58	63	3	Moderate

Table 3.4A-29

Potential Noise Impacts Short-Term Measurement Sites along the Bakersfield Hybrid 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
						Severe	Moderate			
ST-198	56	1,721	Residential	73	57	72	65	73	0	None
ST-203	63	1,228	Residential	69	60	69	64	70	1	None
ST-230	41	504	Residential	66	61	67	61	67	1	None
ST-231	41	596	Residential	68	60	68	63	69	1	None
ST-232	41	513	Residential	64	61	65	60	66	2	Moderate
ST-233	41	292	Residential	62	62	64	59	65	3	Moderate
ST-234	41	292	Residential	68	62	68	63	69	1	None
ST-235	41	806	Residential	67	59	67	62	67	1	None
ST-236	41	720	Residential	75	60	73	65	75	0	None
ST-237	46	888	Residential	73	59	71	65	73	0	None
ST-238	44	1,102	Residential	72	58	71	65	72	0	None
ST-239	43	1,198	Residential	74	58	72	65	74	0	None

Acronyms:

dBA A-weighted decibel(s)
 FRA Federal Railroad Administration
 L_{dn} day-night sound level

Noise Mitigation Guidelines

In general, noise mitigation must be considered when impacts are identified. Mitigation guidelines for the three impact categories identified by FRA are as follows:

- No Impact: No mitigation required.
- Moderate Impact: Mitigation may be considered at the discretion of the Authority, and implementation would be subject to reasonable project-specific factors related to effectiveness, cost, density, and proximity of sensitive receivers.
- Severe Impact: Consideration of 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.

Mitigation of Severe Noise Impacts

The Authority will examine alternatives to avoid, minimize, or mitigate severe noise impacts. If severe noise impacts cannot be avoided, 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 noise barriers as mitigation for severe noise impacts:

- Calculations and Computations for barrier geometry as stated in the FRA High Speed Noise and Vibration assessment, Table 5-3.
- Increase over existing noise levels.
- Number of noise sensitive sites affected.
- The minimum number of affected sites should be at least 10, and the length of a noise barrier should be at least 800 feet.
- Barrier heights up to a maximum of 14 feet will be considered. Mitigation options for areas that require barriers over 14 feet will be studied on a case by case basis.
- The cost limit for a noise barrier would be set at \$55,000 (2010 dollars) per benefited residence.
- The community should approve of implementation of the recommended noise barriers (75% of all affected parties).

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

Substantial Noise Reduction

A minimum outdoor noise reduction of 5 decibels (dB) using the applicable criterion for the property is considered substantial.

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.

Physically Feasible

Noise mitigation measure 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. Noise mitigation measures must not result in an adverse environmental impact, such as significant visual intrusions, blocked views, or adverse effects to a historical site.

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 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 to achieve a substantial noise reduction.

Visual Effects

Noise mitigation measures must be designed, constructed, installed, and implemented in a manner that does not result in adverse impacts to the visual resources in the area. Sound barriers will consist of a solid barrier no more than 6 feet in height. Above 6 feet, the sound barrier will be made of transparent materials. For example, a 13-foot-high sound barrier would consist of 6 feet of solid material on the bottom topped by 7 feet of transparent material.

Cost Effectiveness

The cost for constructing a noise barrier along the at-grade portion of the alignment is estimated to be \$57.60 per square foot, and the cost to construct a noise barrier along the elevated portion of the alignment is \$48 per square foot. The total cost of mitigation cannot exceed \$55,000 per benefitted receiver. 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 dBA or greater) outdoor noise reduction. This calculation will generally limit the use of mitigation in rural areas that have few and/or isolated residential buildings. If the density of residential dwellings is insufficient to make the measure 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 dBA or greater) between the outside and inside noise levels for interior habitable rooms.

Mitigation Parameters

- Prior to operation of the HST the Authority will install sound barriers where they can achieve between 5 and 15 dB of noise reduction, depending on their height and location relative to the tracks. 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 (examples are shown in Figure 3.4-14). 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, and made of various colors, materials, and surface treatments.

- The Authority will work with the communities to identify how the use and height of sound barriers would be determined using jointly developed performance criteria. Other solutions may result in higher numbers of residual impacts than reported herein. Options may be to reduce the height of sound barriers and combine barriers with sound insulation or to accept higher noise thresholds than the FRA's current noise thresholds.
- If sound walls are not proposed or do not reduce sound levels to below a severe impact level, building sound insulation can be installed. 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 is 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. Performance criteria would be established to balance existing noise events and ambient roadway noise conditions as factors for determining mitigation measures.
- If sound walls or sound installation is not effective, the Authority can acquire easements on properties severely affected by noise. Another option for mitigating noise impacts is for the authority to acquire easements on residences likely to be impacted by HST operations in which the homeowners would accept the future noise conditions. This approach is usually taken only in isolated cases where other mitigation options are infeasible, impractical, or too costly.
- The decision to include mitigation assessments may depend on factors such as the number of noise-sensitive sites affected, the relative increase in noise levels, the sensitivity at affected land uses, the effectiveness of mitigation measures, community views, costs versus benefits, design limitations, whether sensitive use is solely indoors, and safety. For example, where land-use activity is solely indoors, an interior Ldn criterion of 45 decibels A-weighted (dBA) from project sources is recommended to determine whether building sound insulation improvements should be considered for mitigation.

FTA / FRA Construction Noise Mitigation

1. Design considerations and project layout:

- Construct noise barriers, such as temporary walls or piles of excavated material, between noisy activities and noise-sensitive receivers.
- Route truck traffic away from residential streets, if possible. Select streets with the fewest homes, if no alternatives are available.
- Site equipment on the construction lot as far away from noise-sensitive sites as possible.
- Construct walled enclosures around especially noisy activities or around clusters of noisy equipment. For example, shields can be used around pavement breakers and loaded vinyl curtains can be draped under elevated structures.

2. Sequence of operations:

- Combine noisy operations so they occur in the same time period. The total noise level produced will not be significantly greater than the level produced if the operations were performed separately.
- Avoid nighttime activities. Sensitivity to noise increases during the nighttime hours in residential neighborhoods.

3. Alternative construction methods:

- Avoid impact pile driving where possible in noise-sensitive areas. Drilled piles or the use of a sonic or vibratory pile driver are quieter alternatives where the geological conditions permit their use.
- Use specially quieted equipment, such as quieted and enclosed air compressors, and mufflers on all engines.
- Select quieter demolition methods, where possible. For example, sawing bridge decks into sections that can be loaded onto trucks results in lower cumulative noise levels than impact demolition by pavement breakers.
- The environmental assessment should include a description of one or more mitigation approach for each affected location.

FTA / FRA Construction Vibration Mitigation

1. Design considerations and project layout:

- Route heavily loaded trucks away from residential streets, if possible. Select streets with fewest homes, if no alternatives are available.
- Operate earthmoving equipment on the construction lot as far away from vibration-sensitive sites as possible.

2. Sequence of operations:

- Phase demolition, earthmoving, and ground-impacting operations so as not to occur in the same time period. Unlike noise, the total vibration level produced could be significantly less when each vibration source operates separately.
- Avoid nighttime activities. People are more aware of vibration in their homes during the nighttime hours.

3. Alternative construction methods:

- Avoid impact pile driving where possible in vibration-sensitive areas. Drilled piles or the use of a sonic or vibratory pile driver causes lower vibration levels where the geological conditions permit their use.
- Select demolition methods not involving impact, where possible. For example, sawing bridge decks into sections that can be loaded onto trucks results in lower vibration levels than impact demolition by pavement breakers, and milling generates lower vibration levels than excavation using clam shell or chisel drops.
- Avoid vibratory rollers and packers near sensitive areas.

Construction Noise and Vibration Mitigation Guidelines

All construction activities in this report were analyzed in terms of their noise impacts in regards to FRA recommended guidelines. Local jurisdictions provide construction noise exempt times where the FRA guidelines are followed. A majority of construction will be conducted during these construction noise exempt times, but when construction is conducted outside of the construction noise exempt times, construction noise must abide by local noise standards. Proper mitigation may be necessary in order to avoid noise impacts at nearby noise-sensitive receivers.

Pile driving activities conducted during the grade separation and elevated track structure construction phases would be the loudest noise generating activity during construction of the high speed train corridor. As previously mentioned, residences within a distance of 410 feet of grade separation construction activities that include pile driving, or within 430 feet of elevated track structure construction activities that include pile driving, would be exposed to noise levels greater than the 80 dBA L_{eq} threshold.

- Piles that are required for structure along the HST corridor and which would be located within 500 feet of a noise sensitive receiver should be installed using the drilling and casing method.

If the drilling and casing method were used, maximum noise levels associated with construction activities would drop by 11 dB, and the distances to the 80 dBA L_{eq} contour would decrease from 410 feet to 180 feet for grade separation construction activities, and decrease from 430 feet to 220 feet for elevated track structure construction activities. Another method to mitigate noise related to pile driving is the use of an auger to install the piles instead of a pile driver which would reduce noise levels substantially. If pile driving is necessary, limit the time of day the activity can occur.

The most effective way to minimize the impact of construction noise during the development of the project is to enforce the time restrictions for the hours of construction as listed in local noise ordinances. It is important for the design engineer to plan the order of operations during construction so that the noise levels resulting from construction operations will not exceed local noise ordinances or those recommended by the FRA. To avoid unnecessary annoyance from construction noise, the following best practices for construction noise control should also be considered for inclusion in construction contract documents:

- All noise-producing project equipment and vehicles using internal combustion engines shall be equipped with mufflers and air-inlet silencers, where appropriate, in good operating condition that meet or exceed original factory specifications. Mobile or fixed "package" equipment (e.g., arc-welders, air compressors) shall be equipped with shrouds and noise control features that are readily available for that type of equipment.
- All mobile or fixed noise-producing equipment used on the project, which is regulated for noise output by a local, state, or federal agency, shall comply with such regulation while in the course of project activity.
- Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practicable from noise-sensitive receivers.
- Material stockpiles should be used to block line of site to nearby noise-sensitive receivers when possible.
- Locating fixed noise-generating equipment as far from noise-sensitive land uses as is practical.

- Limit the loudest construction activities, such as concrete breaking and jack hammering, to the middle of the day when the sensitivity to such noises will be minimal. Noise-producing signals, including horns, whistles, alarms, and bells shall be used for safety warning purposes only.
- No project-related public address or music system shall be audible at any adjacent receiver.
- If complaints arise, the contractor shall initiate a construction noise monitoring plan to ensure the construction noise levels at the nearest noise-sensitive land uses are within the limits of the noise ordinance.
- Avoid nighttime construction in residential neighborhoods.
- During nighttime work, use smart back-up alarms, which automatically adjust the alarm level based on the background level, or switch off back-up alarms and replace with spotters.
- Re-route construction-related truck traffic along roadways that will cause the least disturbance to residents.
- Implement noise-deadening measures for truck loading and operations.
- Minimize the use of generators to power equipment.
- Grade surface irregularities on construction sites.
- Use of temporary noise barriers shall be considered where project activities and equipment are unavoidably close to noise-sensitive receivers.
- Use of on-site trailers and containers as temporary barriers between any fixed construction noise source and nearby sensitive receivers.
- All workers involved with the construction of this project must be protected from excessive noise exposure as mandated by the Occupational Safety and Health Administration (OSHA), which has regulated worker noise exposure to a time-weighted-average of 90 dBA over an 8 hour work shift. Areas where levels exceed 85 dBA must be designated and labeled as high-noise-level areas where hearing protection is required.

Construction Vibration Mitigation

After locating potential vibration impacts due to construction with the use of the procedure outlined above, mitigation may be necessary to ensure that there will be no vibration impacts at sensitive receivers. Changes in the design and project layout, changes in the sequence of operations, and using alternative construction methods are all available vibration mitigation options.

When the engineers design the project and the layout of the project, heavily loaded trucks can be re-routed away from residential streets and onto streets with fewer homes. Earthmoving equipment on the construction lot should also be operated as far as possible from sensitive receivers. Changes in the sequence of operations can also mitigate vibration impacts at sensitive receivers. Construction activities that cause high levels of vibration should be staggered so that multiple sources of vibration are not occurring at once. Nighttime construction activities should also be avoided. Alternative construction methods are also an acceptable vibration mitigation option. If pile driving does occur, impact pile driving should be avoided near vibration-sensitive areas. A sonic or vibratory pile driver will generate lower vibration levels at sensitive receivers. Demolition methods not involving impacts should be used when possible. The utilization of vibratory rollers and packers should be avoided near vibration-sensitive receivers.

This page intentionally left blank