Appendix I
Noise Technical Memorandum for SR 509:Corridor Completion/I-5/South Access Road

Draft Noise Technical Memorandum for SR 509: Corridor Completion/I-5/South Access Road

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Introduction

This technical memorandum provides a detailed account of the methods and procedure, data, and results of the traffic noise study conducted for the SR 509: Corridor Completion/I-5/South Access Road Project. This study was conducted to further evaluate potential noise barrier locations for the preferred alternative (Alternative C2). Figure 1 shows the location of the project.

Methodology

This noise analysis has been conducted in accordance with the requirements of Washington State Department of Transportation (WSDOT) Traffic Noise Analysis and Abatement Policies and Procedures. The analysis takes into account roadway design data, topography information, and existing berms and barriers throughout the project area. A combination of onsite noise level measurements and noise modeling utilizing Federal Highway Administration (FHWA) Traffic Noise Model (TNM) Version 2.0 was used to establish peak-hour traffic noise levels along Interstate 5 (I-5) and ambient noise levels along the proposed SR 509 corridor, and to predict future peak-hour noise levels throughout the project corridor.

The noise impacts of the Preferred Alternative were evaluated by measuring noise levels and concurrent traffic counts in the project area to validate the FHWA TNM. The validated noise model was then used to predict peak-hour traffic noise levels without the project and future noise levels from the proposed project using forecast traffic data and the existing and proposed roadway geometry.

FHWA's TNM is a new analytical method for traffic noise evaluation that will formally replace the current FHWA Model (STAMINA 2.0) as the preferred method for highway traffic noise prediction. The TNM noise model is based on reference energy emission levels

for automobiles, medium-size trucks (two axles), heavy trucks (three or more axles), buses, and motorcycles, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. TNM was developed to predict noise levels for both constant-flow and interrupted-flow traffic conditions. The model enables the user to account for the effects of pavement type, graded roadways, and attenuation over and through rows of buildings and dense vegetation.

Traffic data, including existing and projected future (2020) volumes and truck percentages used in the TNM, were derived from traffic count data and traffic forecast studies conducted in the project area. The traffic data used in the noise analysis are shown in Attachment A.

The noise analysis further evaluates the noise-reducing effects of noise barriers at impacted neighborhoods, and recommends reasonable and feasible noise barriers for construction in accordance with 23 CFR 772 and WSDOT Traffic Noise Analysis and Abatement Policies and Procedures.

Existing Noise Environment

A noise-level measurement survey was conducted between July 11 and July 13, 2002. The survey consisted of short-term traffic noise level measurements at 13 representative residential locations along I-5 and continuous (24-hour) background noise level measurements at three residences near the proposed SR 509 alignment that are currently affected by noise from flight operations at Seattle-Tacoma International Airport (Sea-Tac Airport). These measurements were used to establish existing background noise levels and to obtain traffic noise levels and simultaneous traffic count data for validating the TNM input data for the noise analysis. The short-term traffic noise monitoring locations are depicted as Sites 1 through 13 and the continuous noise monitoring locations are shown as Sites A1 through A3 in Figures 2A through 2I. Following are descriptions of the noise monitoring locations.

Traffic Noise Monitoring Locations:

1. 2839 South 308th Lane
2. Church west of I-5
3. Mobile home #204 at the end of Sir Galahad Court (west of I-5)
4. Mobile home #67 at Sir Galahad Court (west of I-5)
5. 2923 South 285th Street
6. 28106 29th Avenue South
7. 3005 South 265th Street
8. End of South 259th Court cul-de-sac (west of I-5)
9. 25509 32nd Place South
10. 3025 South 252nd Street
11. 22856 30th Avenue South (Silverwood Apartments) between Building 3 and Building 4
12. Midway Neighborhood Park (at setback of nearest home to the north)
13. 21833 32nd Place South

Airport Noise Monitoring Locations:

A1. Residence at 2406 South 207th Street
A2. Residence at 1243 196th Place (east of Des Moines Creek Park)
A3. 1122 South 194th Street (rooftop of building)

The short-term traffic noise level measurements were conducted with a Bruel & Kjaer (B&K) Type 2236 precision integrating sound-level meter equipped with a B&K Type 4155 1/2-inch polarized condenser microphone. A B&K Type 4230 acoustical calibrator was used for the microphone to ensure accurate measurements. Three Larson Davis Laboratories (LDL) Model 824 sound level meters equipped with LDL Type 2560 1/2-inch microphones were used to measure continuous noise levels at locations near Sea-Tac Airport. An LDL Model CA200 acoustical calibrator was used for these sound-level meters. All of the equipment complies with the requirements of the American National Standards Institute (ANSI) and the International Electrotechnical Commission (IEC) for precision sound level measurement instrumentation.

Weather conditions during the survey consisted of mostly clear skies with temperatures near 70 to 80ºF. Winds varied between calm to 5 miles per hour, with prevailing winds from the north-northwest except for the afternoon of July 13, when prevailing winds were from the south.

Traffic Noise-Level Measurements and Noise Model Validation

TNM input files were developed using the existing I-5 roadway geometry, local terrain, vegetation, and the traffic count data obtained during this survey. Table 1 summarizes the results of comparisons between the measured traffic noise levels and noise levels predicted by TNM at monitoring locations 1 through 13 (see Figures 2A through 2F for locations). FHWA recommends that no adjustments be made to TNM traffic noise level predictions at a given location if predicted levels using the model are within 3 dBA of measured levels. From the data presented in Table 1, it is apparent that, with the exception of location 8, the differences between predicted and measured noise levels are within the allowable range of ±3 dBA. Therefore, TNM can be used without adjustment to accurately predict traffic noise levels at locations where the model overpredicts traffic noise levels. To safeguard against underestimating traffic noise levels at locations where TNM underpredicted noise levels (locations represented by Sites 2 and 4), the model was adjusted by +2 dBA. At location 8, the difference between the measured and predicted noise levels exceeds the 3 dBA threshold. At locations represented by location 8, it was determined that a –4 dBA adjustment factor should be applied to predict traffic noise exposure.

Table 1

Comparison of Measured and Predicted Traffic Noise Levels (dBA)

Monitoring Location	Measured	Predicted	Difference
1	65.7	68.4	2.7
2	66.9	64.9	-2.0
3	62.0	64.5	2.5
4	65.6	63.8	-1.8
5	68.9	71.8	2.9
6	66.0	67.9	1.9
7	68.4	67.7	-0.7
8	66.9	71.2	4.3
9	65.6	65.4	-0.2
10	71.9	71.9	-0-
11	64.5	66.3	1.8
12	67.3	67.2	-0.1
13	63.9	66.1	2.2

Peak-Hour Traffic Noise Levels

Existing peak-hour traffic data on I-5 (as shown in Attachment A) were used in the validated noise model to predict existing peak-hour traffic noise levels at noise-sensitive locations along I-5. A total of 135 receiver locations along I-5 were selected to evaluate existing peak-hour traffic noise levels, as shown in Figures 2A through 2G. Coincidentally, receiver locations 1 through 13 are in the same locations as the monitoring locations 1 through 13 discussed above. Table 2 summarizes the existing peak-hour traffic noise levels at the 135 receiver locations and identifies those locations where the noise abatement criterion (NAC) of 67 dBA was approached or exceeded.

Table 2

Existing Peak-hour Traffic Noise Levels (dBA)

Receiver Location	Noise Level	Exceeds NAC?	Receiver Location	Noise Level	Exceeds NAC?
1	70.6	YES	69	73.3	YES
2	67.5	YES	70	65.0	NO
3	65.7	NO	71	67.5	YES
4	63.3	NO	72	66.1	YES
5	70.9	YES	73	67.2	YES
6	68.1	YES	74	66.0	YES
7	68.6	YES	75	68.4	YES
8	74.1	YES	76	64.5	NO
9	66.9	YES	77	61.7	NO
10	74.6	YES	78	63.6	NO
11	67.9	YES	79	67.3	YES

Table 2

Existing Peak-hour Traffic Noise Levels (dBA)

Receiver Location	Noise Level	Exceeds NAC?	Receiver Location	Noise Level	Exceeds NAC?
12	68.1	YES	80	69.1	YES
13	66.5	YES	81	64.0	NO
14	71.7	YES	82	73.8	YES
15	73.2	YES	83	72.9	YES
16	75.6	YES	84	66.2	YES
17	57.4	NO	85	66.2	YES
18	72.0	YES	86	70.9	YES
19	64.3	NO	87	70.2	YES
20	69.0	YES	88	60.7	NO
21	69.0	YES	89	66.2	YES
22	76.5	YES	90	72.7	YES
23	66.6	YES	91	68.3	YES
24	71.7	YES	92	71.7	YES
25	60.0	NO	93	72.3	YES
26	61.0	NO	94	69.4	YES
27	---	---	95	63.8	NO
28	63.2	NO	96	68.2	YES
29	68.1	YES	97	73.3	YES
30	74.0	YES	98	72.1	YES
31	66.7	YES	99	60.8	NO
32	65.4	NO	100	64.5	NO
33	62.7	NO	101	67.9	YES
34	64.5	NO	102	67.9	YES
35	70.0	YES	103	65.5	NO
36	61.1	NO	104	62.1	YES
37	67.8	YES	105	70.2	YES
38	62.6	NO	106	65.3	NO
39	59.9	NO	107	65.5	NO
40	61.1	NO	108	67.0	YES
41	63.1	NO	109	61.1	NO
42	69.3	YES	110	64.4	NO
43	59.5	NO	111	61.0	NO
44	60.7	NO	112	67.8	YES
45	58.2	NO	113	65.2	NO
46	60.5	NO	114	60.2	NO
47	65.2	NO	115	58.1	NO
48	60.7	NO	116	63.7	NO
49	63.1	NO	117	65.4	NO
50	64.8	NO	118	66.1	YES
51	64.2	NO	119	67.4	YES

Table 2

Existing Peak-hour Traffic Noise Levels (dBA)

Receiver Location	Noise Level	Exceeds NAC?	Receiver Location	Noise Level	Exceeds NAC?
52	65.0	NO	120	65.1	NO
53	66.0	YES	121	72.3	YES
54	64.9	NO	122	60.5	NO
55	65.6	NO	123	67.0	YES
56	68.1	YES	124	66.4	YES
57	67.6	YES	125	59.6	NO
58	48.9	NO	126	63.7	NO
59	67.0	YES	127	59.9	NO
60	70.8	YES	128	70.0	YES
61	57.6	NO	129	55.0	NO
62	64.8	NO	130	64.5	NO
63	74.5	YES	131	69.4	YES
64	58.7	NO	132	54.2	NO
65	56.9	NO	133	69.2	YES
66	62.1	NO	134	65.8	NO
67	69.6	YES	135	72.4	YES
68	66.7	YES			

Existing Noise Exposure at Noise-Sensitive Areas near Sea-Tac Airport

To establish existing background noise levels at noise-sensitive locations along the Preferred Alternative alignment of SR 509, continuous ambient noise levels were measured at three representative locations (shown as A1 through A3 on Figures 2H and 2I). These measurements included hourly average (L_{eq}) noise levels at each location. Attachment B contains a detailed summary of the ambient noise level measurements.

Aircraft arrivals and departures at Sea-Tac Airport are the main sources of environmental noise at locations A1 through A3. Existing daytime (7 AM to 10 PM) hourly L_{eq} values measured at the proposed SR 509 / 24th Avenue South interchange ranged between 54 and 68 dBA. When southerly aircraft departures are in effect, this area experiences the highest noise levels at 67 to 68 dBA. When aircraft approach the airport from the south, hourly noise levels range from 54 to 57 dBA.

Existing daytime hourly L_{eq} values measured between 57 and 68 dBA at residential areas along South 196th Place and east of Des Moines Memorial Drive. When southerly aircraft departures are in effect, this area experiences the highest noise levels at 67 to 68 dBA. When aircraft approach the airport from the south, hourly noise levels range from 59 to 64 dBA.

Existing daytime hourly L_{eq} values measured between 59 and 63 dBA at exterior areas of multifamily residences along South 194th Street and west of Des Moines Memorial Drive. Increased airport activity between 9 PM and 10 PM result in higher noise levels of

68 dBA L_{eq}. When aircraft depart to the south, hourly noise levels increase to levels ranging from 65 to 67 dBA.

Predicted Future Traffic Noise Levels

Detailed noise modeling utilizing FHWA's TNM was performed for both the No Action Alternative and the Preferred Alternative under 2020 traffic conditions.

Existing topographic data, I-5 as-built plans provided by WSDOT, and forecast future (2020) traffic data were used to predict traffic noise levels under the No Action Alternative. Proposed roadway plans for both I-5 and SR 509, data pertaining to changes in topography (cuts and fills), and forecast future (2020) traffic data with the project were used to predict traffic noise levels under the Preferred Alternative.

Future (2020) noise levels were predicted at a total of 148 noise receiver locations. Figures 2A through 2I depict the noise receiver locations. Sites 1 through 135 are at the same locations along I-5 for which existing noise levels were evaluated. Sites 136 through 148 represent the residential areas near the proposed SR 509 alignment and areas in Des Moines Creek Park closest to the proposed highway. Table 3 summarizes the predicted future traffic noise levels for both the No Action Alternative and the Preferred Alternative and compares them to the existing peak-hour traffic noise levels.

Table 3

Comparison of Future (2020) Peak-hour Traffic Noise Levels to Existing Peak-hour Traffic Noise Levels (dBA)

Receiver Location	Existing Noise Level	2020 No Action		2020 Preferred Alternative	
		Noise Level	Change	Noise Level	Change
1	70.6	71.7	1.1	72.7	2.1
2	67.5	68.6	1.1	68.7	1.2
3	65.7	66.8	1.1	67.3	1.6
4	63.3	64.4	1.1	74.8	1.5
5	70.9	72.0	1.1	73.9	3.0
6	68.1	69.2	1.1	69.7	1.6
7	68.6	69.5	0.9	70.2	1.6
8	74.1	75.0	0.9	76.9	2.8
9	66.9	67.8	0.9	68.8	1.9
10	74.6	75.5	0.9	76.7	2.1
11	67.9	68.7	0.8	--- [a]	--- [a]
12	68.1	68.9	0.8	63.0	-5.1
13	66.5	67.3	0.8	--- [a]	--- [a]
14	71.7	72.8	1.1	72.8	1.1
15	73.2	74.4	1.2	74.4	1.2
16	75.6	76.7	1.1	76.9	1.3
17	57.4	58.6	1.2	58.9	1.5
18	72.0	73.1	1.1	73.2	1.2

Table 3

Comparison of Future (2020) Peak-hour Traffic Noise Levels to Existing Peak-hour Traffic Noise Levels (dBA)

Receiver Location	Existing Noise Level	2020 No Action		2020 Preferred Alternative	
		Noise Level	Change	Noise Level	Change
19	64.3	65.4	1.1	65.6	1.3
20	69.0	70.1	1.1	70.2	1.2
21	69.0	70.1	1.1	69.9	0.9
22	76.5	77.6	1.1	77.6	1.1
23	66.6	67.7	1.1	67.9	1.3
24	71.7	72.8	1.1	72.6	0.9
25	60.0	61.1	1.1	61.6	1.6
26	61.0	62.1	1.1	62.0	1.0
28	63.2	64.3	1.1	64.1	0.9
29	68.1	69.2	1.1	69.8	1.7
30	74.0	75.1	1.1	76.7	2.7
31	66.7	67.8	1.1	70.8	4.1
32	65.4	66.5	1.1	69.3	3.9
33	62.7	63.8	1.1	63.5	0.8
34	64.5	65.6	1.1	65.2	0.7
35	70.0	71.1	1.1	70.3	0.3
36	61.1	62.2	1.1	62.0	0.9
37	67.8	68.9	1.1	68.7	0.9
38	62.6	63.7	1.1	63.4	0.8
39	59.9	61.0	1.1	60.7	0.8
40	61.1	62.2	1.1	63.6	2.5
41	63.1	64.2	1.1	63.9	0.8
42	69.3	70.4	1.1	72.5	1.1
43	59.5	60.6	1.1	60.3	1.1
44	60.7	61.8	1.1	61.5	0.8
45	58.2	59.3	1.1	59.1	0.9
46	60.5	61.6	1.1	61.5	1.0
47	65.2	66.3	1.1	67.1	1.9
48	60.7	61.8	1.1	61.7	1.0
49	63.1	64.2	1.1	64.2	1.1
50	64.8	65.9	1.1	65.7	0.9
51	64.2	65.3	1.1	65.1	0.9
52	65.0	66.1	1.1	65.8	0.8
53	66.0	67.0	1.0	66.8	0.8
54	64.9	66.0	1.1	65.8	0.9
55	65.6	66.6	1.0	66.4	0.8
56	68.1	69.2	1.1	68.9	0.8

Table 3

Comparison of Future (2020) Peak-hour Traffic Noise Levels to Existing Peak-hour Traffic Noise Levels (dBA)

Receiver Location	Existing Noise Level	2020 No Action		2020 Preferred Alternative	
		Noise Level	Change	Noise Level	Change
57	67.6	68.7	1.1	65.2	-2.4
58	65.4	66.5	1.1	65.3	-0.1
59	67.0	68.1	1.1	67.1	0.1
60	70.8	71.9	1.1	71.8	1.0
61	57.6	58.7	1.1	59.5	1.9
62	64.8	65.8	1.0	67.8	3.0
63	74.5	75.6	1.1	75.3	0.8
64	58.7	59.8	1.1	61.3	2.6
65	56.9	58.0	1.1	59.2	2.3
66	62.1	63.1	1.0	63.9	1.8
67	65.2	66.4	1.2	66.8	1.6
68	66.7	67.8	1.1	65.8	-0.9
69	73.3	74.2	0.9	73.6	0.3
70	65.0	65.8	0.8	66.2	1.2
71	67.5	68.3	0.8	69.1	1.6
72	66.1	67.0	0.9	67.6	1.5
73	67.2	68.1	0.9	68.8	1.6
74	66.0	66.9	0.9	67.5	1.5
75	68.4	69.3	0.9	69.7	1.3
76	64.5	65.4	0.9	66.2	1.7
77	61.7	62.6	0.9	63.5	1.8
78	63.6	64.4	0.8	65.2	1.6
79	67.3	68.2	0.9	69.0	1.7
80	69.1	69.9	0.8	71.0	1.9
81	64.0	64.9	0.9	65.8	1.8
82	73.8	74.7	0.9	75.5	1.7
83	72.9	73.8	0.9	74.3	1.4
84	66.2	67.1	0.9	68.2	2.0
85	66.2	67.1	0.9	68.8	2.6
86	70.9	71.7	0.8	74.0	3.1
87	70.2	71.0	0.8	74.6	4.4
88	60.7	61.4	0.7	62.6	1.9
89	66.2	66.9	0.7	65.4	-0.8
90	72.7	73.5	0.8	74.5	1.8
91	68.3	69.1	0.8	72.3	4.0
92	71.7	72.5	0.8	74.7	3.0
93	72.3	73.1	0.8	74.9	2.6

Table 3

Comparison of Future (2020) Peak-hour Traffic Noise Levels to Existing Peak-hour Traffic Noise Levels (dBA)

Receiver Location	Existing Noise Level	2020 No Action		2020 Preferred Alternative	
		Noise Level	Change	Noise Level	Change
94	69.4	70.2	0.8	74.9	5.5
95	63.8	64.6	0.8	68.0	4.2
96	68.2	69.0	0.8	69.5	1.3
97	73.3	74.1	0.8	73.7	0.4
98	72.1	72.8	0.7	76.0	3.9
99	60.8	61.4	0.6	63.1	2.3
100	64.5	65.2	0.7	65.0	0.5
101	67.9	68.6	0.7	73.1	5.2
102	67.9	68.6	0.7	59.4	-8.5
103	65.5	66.3	0.8	67.1	1.6
104	62.1	62.9	0.8	62.8	0.7
105	70.2	71.0	0.8	73.0	2.8
106	65.3	66.2	0.9	64.6	-0.7
107	65.5	66.3	0.8	68.3	2.8
108	67.0	67.8	0.8	73.6	6.6
109	61.1	61.9	0.8	67.4	6.3
110	64.4	65.2	0.8	72.2	7.8
111	61.0	61.8	0.8	66.2	5.2
112	67.8	68.6	0.8	79.4	11.6
113	65.2	66.0	0.8	76.7	11.5
114	60.2	61.0	0.8	65.8	5.6
115	58.1	58.9	0.8	63.5	5.4
116	63.7	64.5	0.8	--- [a]	--- [a]
117	65.4	66.2	0.8	68.4	3.0
118	66.1	66.8	0.7	77.2	11.1
119	67.4	68.2	0.8	67.8	0.4
120	65.1	65.8	0.7	75.2	10.1
121	72.3	73.0	0.7	72.5	0.2
122	60.5	61.3	0.8	73.0	12.5
123	67.0	67.8	0.8	68.0	1.0
124	66.4	67.2	0.8	68.9	2.5
125	59.6	60.3	0.7	73.0	13.4
126	63.7	64.5	0.8	66.5	2.8
127	59.9	60.7	0.8	65.3	5.4
128	70.0	70.8	0.8	70.3	0.3
129	55.0	55.8	0.8	70.5	14.5
130	64.5	65.3	0.8	67.3	2.8

Table 3

Comparison of Future (2020) Peak-hour Traffic Noise Levels to Existing Peak-hour Traffic Noise Levels (dBA)

Receiver Location	Existing Noise Level	2020 No Action		2020 Preferred Alternative	
		Noise Level	Change	Noise Level	Change
131	69.4	70.2	0.8	70.1	0.6
132	54.2	55.0	0.8	62.8	8.6
133	69.2	70.0	0.8	69.5	0.3
134	65.8	66.6	0.8	67.9	2.1
135	72.4	73.2	0.8	---	---
136	---	---	---	75.4	---
137	---	---	---	67.9	---
138	---	---	---	67.8	---
139	---	---	---	64.6	---
140	---	---	---	66.8	---
141	---	---	---	68.5	---
142	---	---	---	70.2	---
143	---	---	---	68.6	---
144	---	---	---	66.6	---
145	---	---	---	67.6	---
146	---	---	---	67.7	---
147	---	---	---	69.2	---
148	---	---	---	72.5	---

Note: Underlined numbers indicate locations where the NAC is approached or exceeded.
***Bold** numbers indicate locations where a substantial increase in noise level is anticipated.*

[a] *These receivers will no longer exist in 2020 due to right-of-way acquisition.*

Noise Abatement Analysis

Available roadway design and topographic data were used to evaluate the effectiveness of barriers as a noise abatement measure under the Preferred Alternative. Based on the results of this evaluation, 20 noise barrier locations were identified throughout the project corridor and these locations were evaluated for feasibility and reasonableness per the WSDOT criteria.

FHWA's TNM first determined the exact locations and heights of noise barriers that would meet WSDOT's feasibility criteria. A noise barrier is considered feasible if it reduces noise by 7 dBA at a minimum of one first-row location, and reduces noise levels by 5 dBA or more at 60 percent or more of first-row homes. Second-row receivers are counted as benefited if the noise barrier reduces noise by 3 dBA. Table 4 summarizes the results of the noise barrier calculations.

Table 4

Noise Barrier Noise Reduction Calculations (dBA)

Receiver Location	Noise Level Without Barrier	12-Foot High Barrier		14-Foot-High Barrier		16-Foot-High Barrier	
		Noise Level	I.L.	Noise Level	I.L.	Noise Level	I.L.
Barrier 1: West Side of I-5 between South 320th and South Military Road							
1	72.7	66.9	6	66.6	6	66.4	6
14	72.8	64.5	10	63.7	11	63.0	11
15	74.4	65.4	12	64.7	12	64.0	13
16	76.9	57.4	2	57.9	1	58.1	1
17	58.9	64.4	9	63.8	9	63.0	10
18	73.2	59.8	6	59.3	6	58.8	7
19	65.6	63.8	6	63.1	7	62.4	8
20	70.2	65.5	7	64.4	8	63.3	9
Barrier 2: West Side of I-5, North of South Military Road							
22	77.6	---	---	66.7	11	65.6	12
23	67.9	---	---	65.5	2	64.7	3
2	68.7	---	---	61.7	7	61.2	8
25	61.6	---	---	59.7	2	59.5	2
Barrier 2a: North of Barrier 2							
29	69.8	63.4	6	63.0	7	62.5	7
30	76.7	69.3	7	68.8	8	68.6	8
Barrier 3: East Side of I-5, North of South Military Road							
21	69.9	64.6	5	64.3	6	64.2	6
24	72.6	65.5	7	64.3	8	63.5	9
Barrier 3a: East Side of I-5 Northward Extension of Existing Barrier South of South 288th Street							
35	70.3	65.8	5	65.6	5	65.4	5
Barrier 5: West Side of I-5, North of South 288th Street							
42	72.5	68.4	4	67.1	5	66.1	6
5	73.9	69.4	5	67.4	7	66.0	8
47	67.1	61.6	5	60.9	6	60.3	7
Barrier 6: East Side of I-5, South of South 272nd Street							
53	66.8	61.4	5	61.1	6	60.8	6
54	65.8	62.6	3	62.4	3	62.2	4
55	66.4	61.8	5	61.4	5	61.1	5
56	68.9	62.0	7	61.2	8	60.6	8
60	71.8	63.0	9	61.9	10	61.0	11
63	75.3	67.1	8	66.4	9	65.7	10
Barrier 8: West Side of I-5, North of South 272nd Street							
69	73.6	65.4	8	64.8	9	64.3	9
70	66.2	64.9	1	64.8	1	64.8	1
Barrier 9: East Side of I-5, North of South 272nd Street							
7	70.2	65.3	5	64.8	5	64.4	6
71	69.1	64.7	4	64.6	5	64.4	5
Barrier 10a: West Side of I-5, South of South 260th Street							
72	67.6	62.3	5	62.0	6	61.7	6
Barrier 10: West Side of I-5, North of South 260th Street							
8	76.9	65.8	11	64.8	12	63.8	13

Table 4

Noise Barrier Noise Reduction Calculations (dBA)

Receiver Location	Noise Level Without Barrier	12-Foot High Barrier		14-Foot-High Barrier		16-Foot-High Barrier	
		Noise Level	I.L.	Noise Level	I.L.	Noise Level	I.L.
74	67.5	64.2	3	63.4	4	63.0	5
75	69.7	62.9	7	62.7	7	62.2	8
10	76.7	76.0	1	75.4	1	74.5	2
Barrier 12: West Side of I-5, South of SR 516							
85	68.8	66.3	3	66.1	3	65.9	3
Barrier 16: East of I-5 between SR 516 and South 216th Street							
89	65.4	63.6	2	63.5	2	63.4	2
91	72.3	67.7	5	66.2	6	65.3	7
94	74.9	64.9	10	64.1	11	63.4	12
95	68.0	61.3	7	60.9	7	60.6	7
98	76.0	67.1	9	66.1	10	65.1	11
99	63.1	58.6	5	58.4	5	58.1	5
100	65.0	60.9	4	60.4	5	60.0	5
102	59.4	58.4	1	58.0	1	57.4	2
103	67.1	61.4	6	60.5	7	59.8	7
105	73.0	71.4	2	69.0	4	67.2	6
108	73.6	65.1	9	64.3	9	63.5	10
109	67.4	62.9	5	62.3	5	61.7	6
110	72.2	63.8	8	63.2	9	62.6	10
111	66.2	64.5	2	64.4	2	64.2	2
113	76.7	66.3	10	65.9	11	65.5	11
Barrier 17a: East of I-5 between South 216th Street and Remaining Existing Barrier							
114	65.8	62.4	3	62.1	4	61.9	4
115	63.5	59.7	4	58.9	5	58.7	5
117	68.4	64.4	4	64.1	4	63.9	5
Barrier 17b: East of I-5, North of Existing Barrier							
121	72.5	69.8	3	69.0	4	67.9	5
123	68.0	63.9	4	63.0	5	62.0	6
128	68.1	64.0	6	63.0	7	62.0	8
131	70.1	62.0	8	61.5	9	61.0	9
133	69.5	62.1	7	61.6	8	61.3	8
Barrier 18: North Side of SR 509, East of SR 99							
136	75.4	66.8	9	65.9	10	64.9	11
137	67.9	65.0	3	64.7	3	64.4	4
138	67.8	66.4	2	66.3	2	66.1	2

I.L. = insertion loss

Noise Barrier Reasonableness Determination

Once construction of a noise barrier has been determined to be feasible, WSDOT determines whether construction is reasonable by thoroughly considering a wide range of criteria. Noise barriers are only constructed if they are both feasible and reasonable. The decision to recommend implementation of a noise barrier is typically the responsibility of the Regional

Traffic Noise Abatement Manager, with concurrence from design personnel. Reasonableness is determined based on the following factors:

- Noise level in the design year approaches or exceeds the noise abatement criteria in Table 1 of 23 CFR 772 or qualifies as a substantial exceedance.
- Most (60 percent or more) first-row receivers obtain a minimum 5-dBA insertion loss and at least one has at least a 7-dBA reduction.
- The noise mitigation cost per residence (or residential equivalent) is at or less than that indicated in Table 5. This is determined by counting all residences (including owner-occupied, rental units, mobile homes) benefited by the noise barrier in any subdivision or given development and dividing that number into the total cost of the noise abatement measure. Each unit in a multifamily building is counted as a separate residence. Table 5 shows that as predicted future noise levels increase, it is reasonable to implement more costly measures, if necessary, to mitigate traffic noise.

Table 5

Allowance for Impacts Caused by Total Traffic Noise Level

Design Year Traffic Noise Decibel Level (dBA)	Allowed Cost per Household [a]	Equivalent Wall Surface Area per Household
66	$15,500	65.0 m^2 (700 ft^2)
67	$17,000	71.5 m^2 (770 ft^2)
68	$18,500	77.7 m^2 (837 ft^2)
69	$20,000	84.0 m^2 (905 ft^2)
70	$21,500	90.5 m^2 (973 ft^2)
71	$23,000	96.7 m^2 (1041 ft^2)
72	$24,500	103.0 m^2 (1109 ft^2)
73	$26,000	109.2 m^2 (1176 ft^2)
74	$27,500	115.5 m^2 (1244 ft^2)

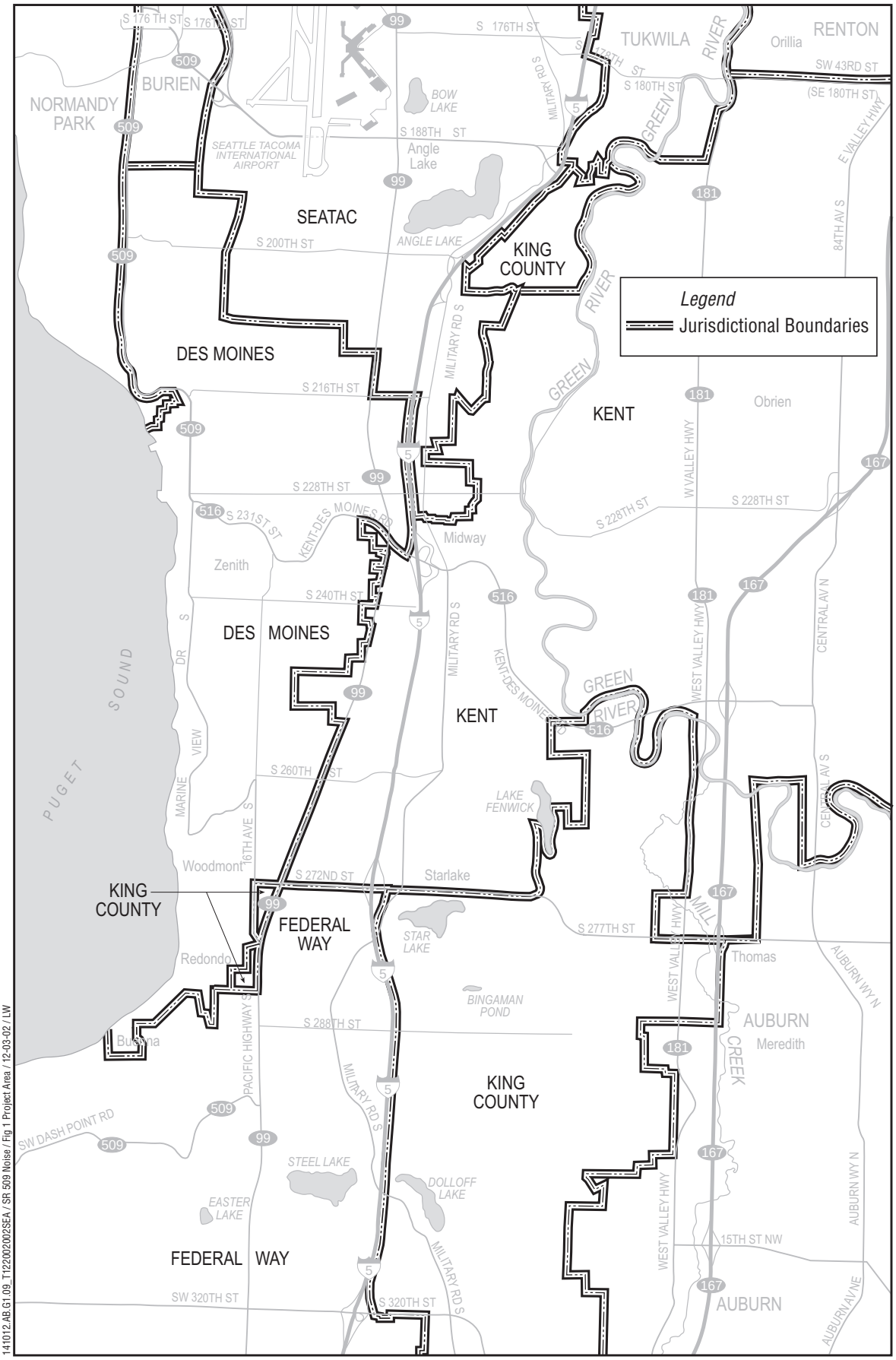
[a] Reevaluated in January of each year. Based on $22.1 per square foot constructed cost. Source: WSDOT Noise Analysis and Abatement Policies. <fix>

- Property use is considered a factor affecting the reasonableness of abatement. For example, churches and parks may be used only during specific hours or days of the week. These facilities generally have a greater number of receivers than if simply counted as a residence. In such cases, residential equivalents are used (usage factor multiplied by the number of users), in accordance with WSDOT Directive D22-22.

Table 6 summarizes the results of the noise barrier reasonableness analysis. Based on the findings of the detailed noise barrier evaluation, it is preliminarily determined that it would be reasonable to construct noise barriers at the locations shown by Figures 2A through 2G.

Table 6
Preliminary Noise Barrier Reasonableness Determination

Barrier Number	Noise Levels Without Barrier (dBA)	Noise Levels With Barrier (dBA)	Amount of Noise Reduction (dBA)	Barrier Height (ft)	Barrier Length (ft)	Barrier Surface Area (ft^2)	Total Barrier Cost ($)	Number of Benefited Homes	Barrier Cost Allowance ($)	Reasonable to Build?
1	59-77	57-66	6-12	12–16	3,375	44,103	974,700	45	976,500	**Yes**
2	62-77	60-66	2-12	14-16	2,040	30,196	667,300	22	716,500	**Yes**
2a	70-77	62-66	6-11	12-22	1,062	15,606	344,900	6	139,500	No
3	70–73	65	3–8	10–13	1,018	12,008	265,400	8	169,000	No
3a	70	65	5	16	373	5,970	131,900	3	61,500	No
4	69–71	62–63	7–8	14–16	1,324	19,110	422,300	40	920,000	**Yes**
5	67-74	61-65	5-9	12–18	1,110	16,731	369,800	17	400,000	**Yes**
6	66–75	61-65	3-10	12-16	1,382	17,737	392,000	16	329,000	No
7	62–74	59–65	3–11	12–16	1,143	17,256	381,400	16	392,000	No
8	66-74	65	1–8	12	734	8,809	194,700	5	137,500	No
9	69-70	63-64	5-7	14-20	757	12,614	278,800	4	80,000	No
10a	68	61-62	5-7	22	1,052	23,144	511,500	16	260,000	No
10	68-77	63-64	5-10	10-12	1,724	19,243	425,300	25	449,000	**Yes**
11	Existing noise barrier needs to be extended northward by 370 feet.									**Yes**
13	65–78	62–65	6–13	10–18	5,710	86,037	1,901,400	151	4,100,000	**Yes**
14	65–71	60–62	6–10	12–22	2,160	39,207	866,500	27	661,500	**Yes**
15	63–73	62–65	5–10	14–20	4,103	63,654	1,406,800	60	1,560,000	**Yes**
17a	64-68	59-64	4-5	14	882	12,342	272,800	19	279,500	**Yes**
17b	68-73	63-68	4-7	10-16	1,649	19,215	424,700	20	437,500	**Yes**
18	68–75	64–65	3–10	16	1,004	16,067	355,100	22	600,000	**Yes**
19	67–68	61–62	5–7	18	697	12,546	277,300	3	55,500	No
20	69–70	62–64	6–7	16	704	11,262	248,900	5	107,500	No
21	69–73	61–65	7–8	12–20	1,002	17,286	382,000	13	338,000	No

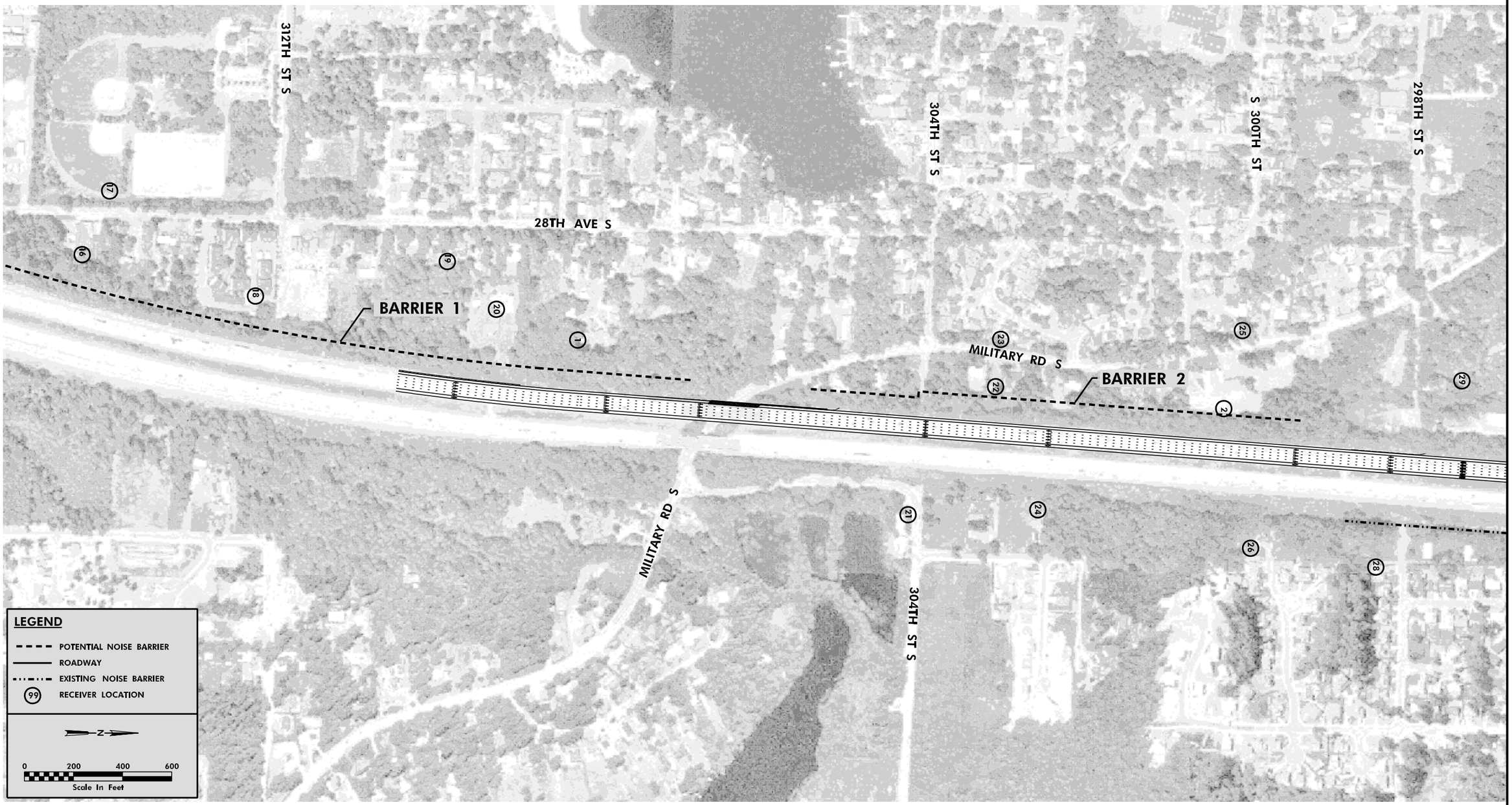


1410112.AB.G1.09_T122002002SEA / SR 509 Noise / Fig 1 Project Area / 12-03-02 / LW

FIGURE 1

Project Area

SR 509: Corridor Completion/I-5/South Access Road
Environmental Impact Statement



PRELIM IN ARY

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FIGURE 2A

NOISE RECEIVERS AND POTENTIAL NOISE BARRIER LOCATIONS
S 296TH ST / I-5
TO S 312TH ST / I-5

FILE NAME: si501c_fig.dgn 06-JAN-2003 14:02:30

MILITARY RD S

S 298TH ST

S 288TH ST

S 284TH ST

MILITARY RD S

BARRIER 4

EXISTING NOISE BARRIER

BARRIER 5

EXISTING NOISE BARRIER

34TH AVE S

S 288TH ST

LEGEND

- POTENTIAL NOISE BARRIER
- ROADWAY
- EXISTING NOISE BARRIER
- (28) RECEIVER LOCATION

N

0 200 400 600

Scale In Feet

PRELIMINARY

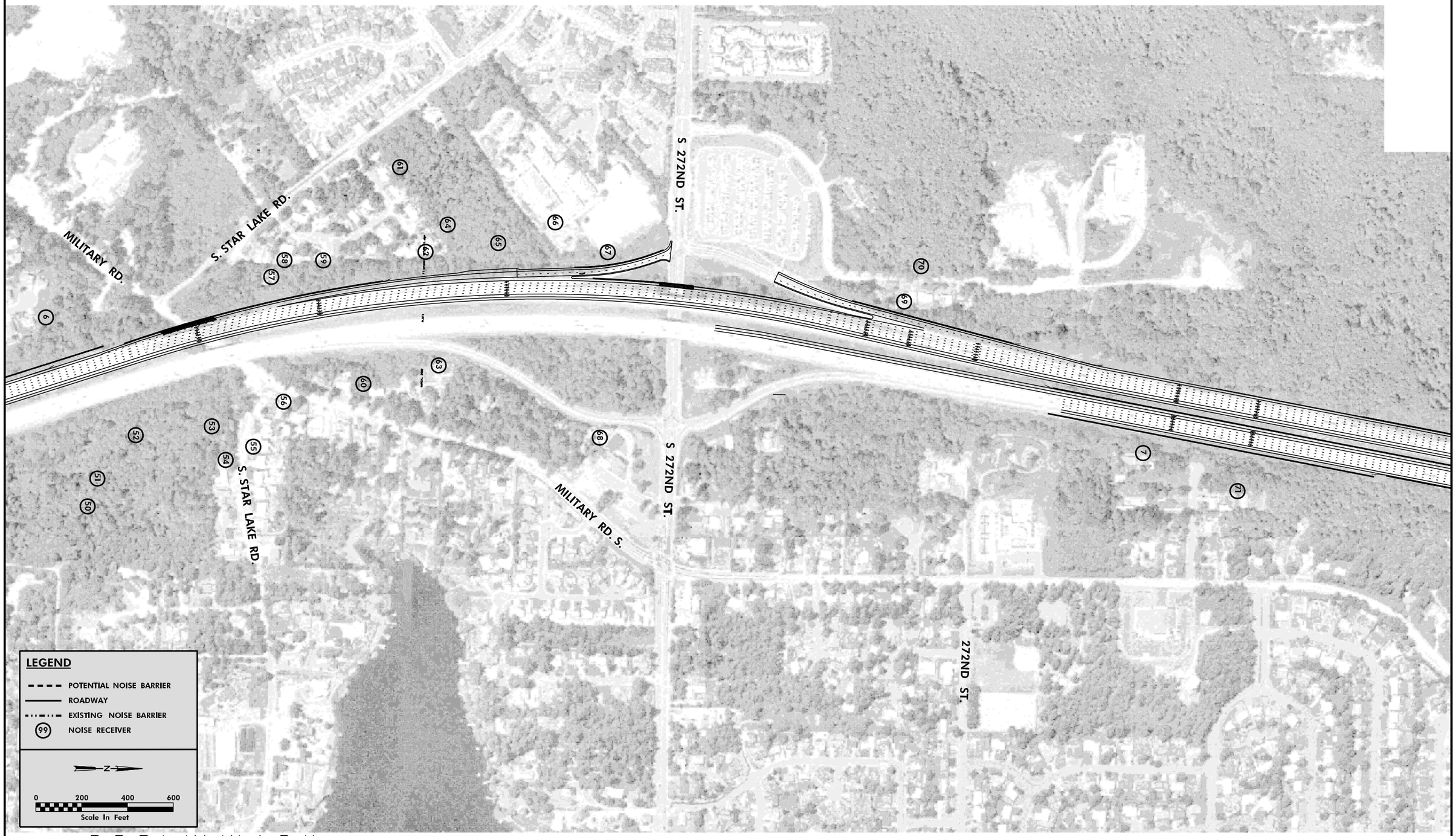
CH2MHILL

Washington State Department of Transportation

FIGURE 2B

NOISE RECEIVERS AND POTENTIAL NOISE BARRIER LOCATIONS
S 298TH ST / I-5
TO S 284TH ST / I-5

FILE NAME: si502c_fig.dgn 06-JAN-2003 14:10:28



PRELIMINARY

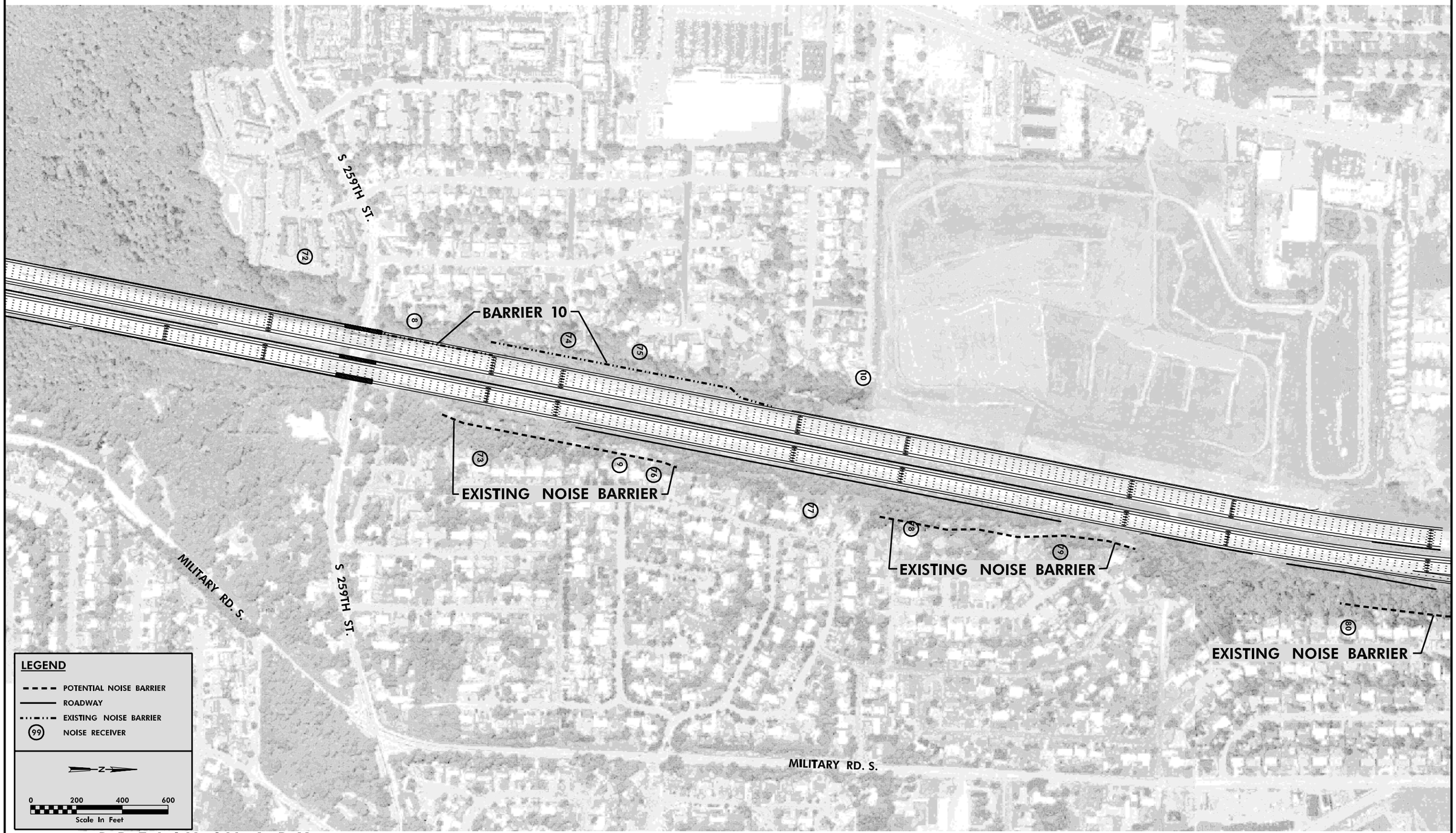
CH2MHILL

Washington State Department of Transportation

FIGURE 2C

NOISE RECEIVERS AND POTENTIAL NOISE BARRIER LOCATIONS
S STAR LAKE RD / I-5
TO S 268TH ST / I-5

FILE NAME: si503c_fig.dgn 06-JAN-2003 14:13:51



PRELIMINARY

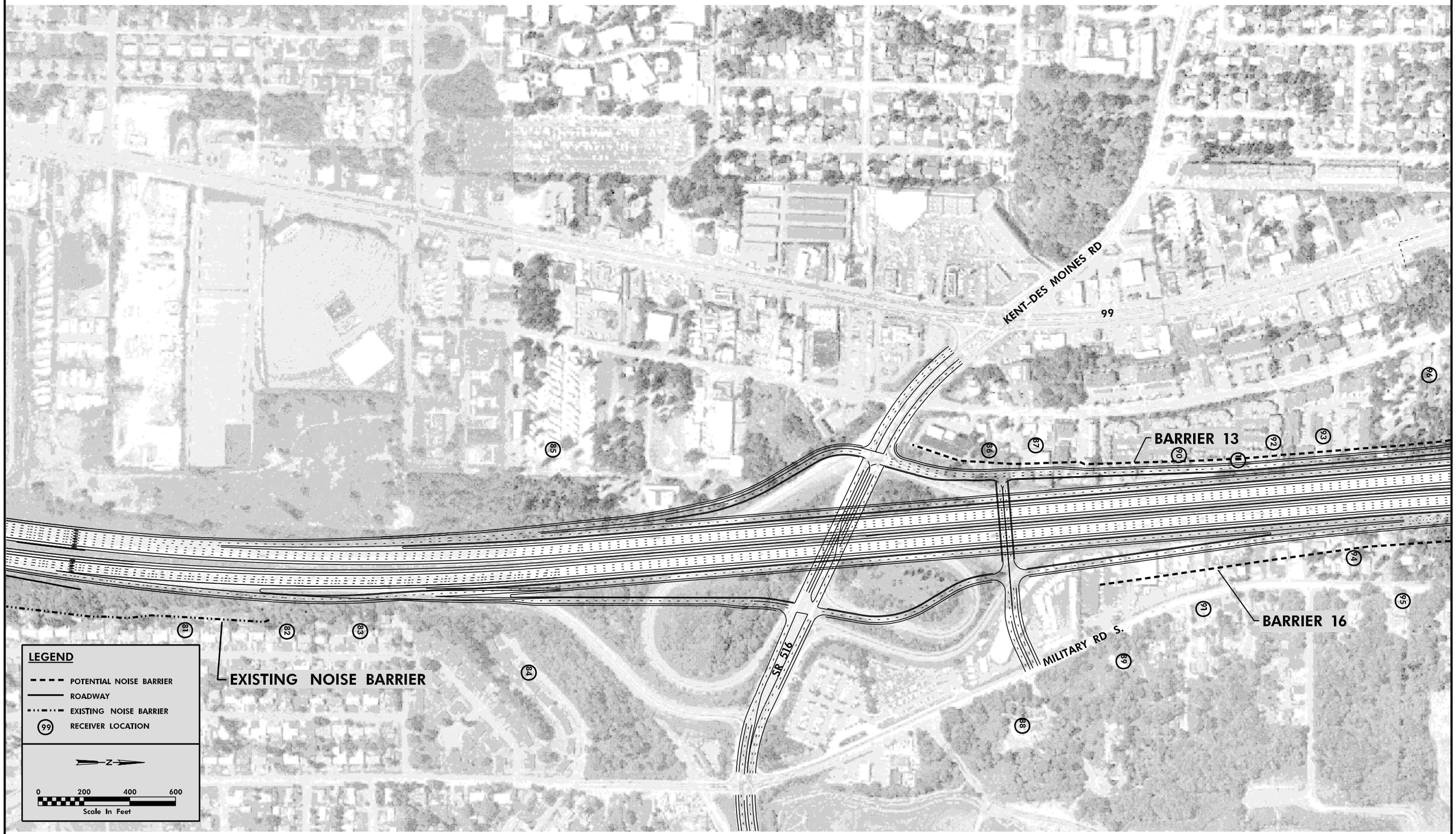
CH2MHILL

Washington State Department of Transportation

FIGURE 2D

NOISE RECEIVERS AND POTENTIAL NOISE BARRIER LOCATIONS
S 260TH ST / I-5
TO S 246TH ST / I-5

FILE NAME: si504c_fig.dgn 07-JAN-2003 09:43:17



PRELIMINARY

CH2MHILL

Washington State Department of Transportation

FIGURE 2E

NOISE RECEIVERS AND POTENTIAL NOISE BARRIER LOCATIONS
SR 509/ 12TH PLACE SOUTH
TO SOUTH 224TH STREET / I-5

FILE NAME: si505c_fig.dgn 07-JAN-2003 10:19:08

S 224TH ST

S 220TH ST

S 216TH ST

SR 99 – INT'L BLVD

BARRIER 13

BARRIER 14

BARRIER 15

BARRIER 16

BARRIER 17a

EXISTING NOISE BARRIER

BARRIER 17b

LEGEND

- POTENTIAL NOISE BARRIER
- ROADWAY
- EXISTING NOISE BARRIER
- (99) RECEIVER LOCATION

N

0 200 400 600

Scale In Feet

PRELIMINARY

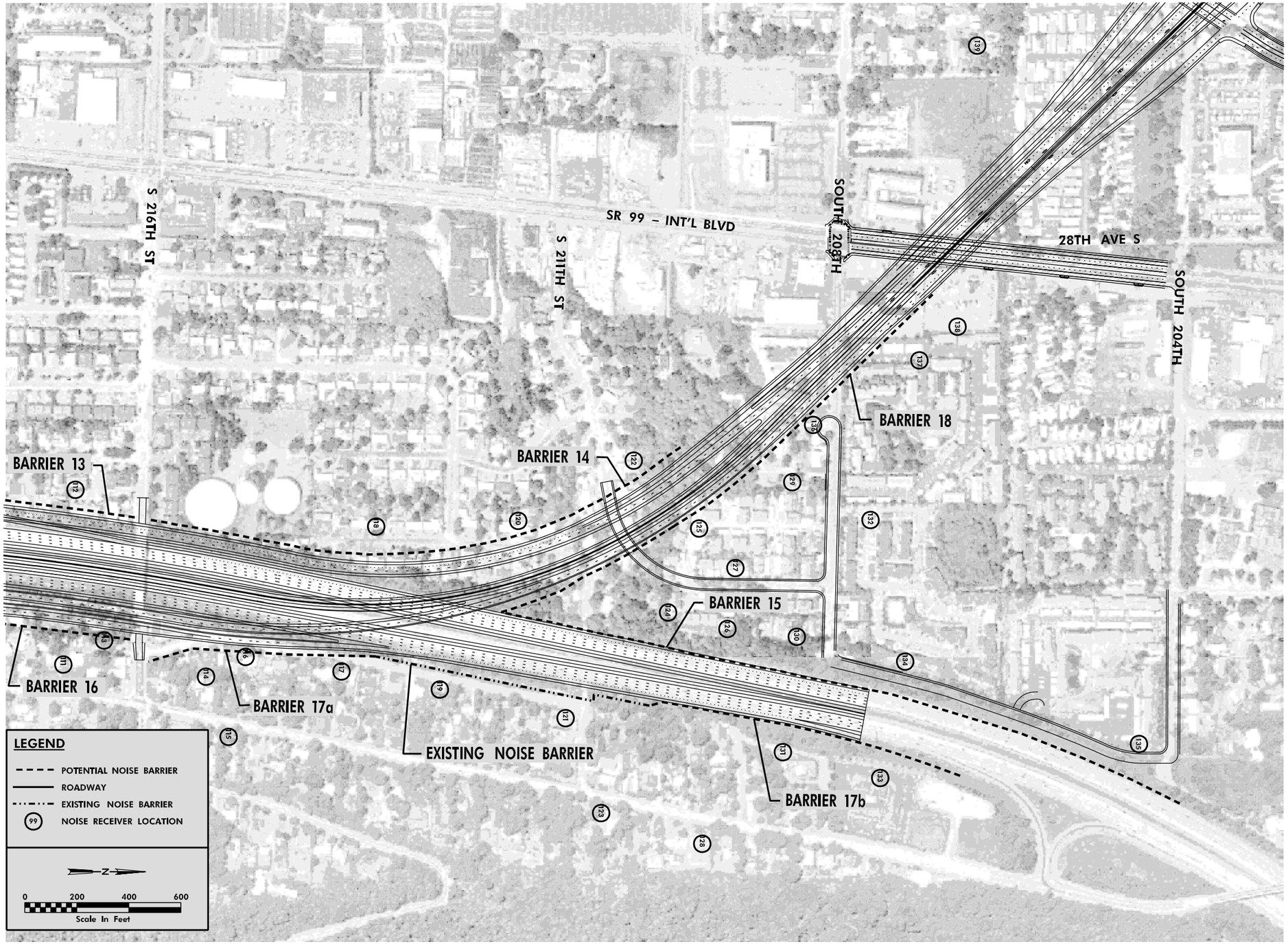
CH2MHILL

Washington State Department of Transportation

FIGURE 2F

NOISE RECEIVERS AND POTENTIAL NOISE BARRIER LOCATIONS
S 216TH / I-5
TO S 224TH / I-5

FILE NAME: si500c_fig.dgn 07-JAN-2003 09:19:22



PRELIMINARY

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Washington State Department of Transportation

FIGURE 2G

NOISE RECEIVERS AND POTENTIAL NOISE BARRIER LOCATIONS
S 204TH ST / I-5
TO S 216TH ST / I-5

FILE NAME: si500b_fig.dgn 07-JAN-2003 08:52:44

PRELIMINARY

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Washington State Department of Transportation

FIGURE 2H

NOISE RECEIVERS AND POTENTIAL NOISE BARRIER LOCATIONS
SR 509
PREFERRRED ALTERNATIVE

FILE NAME: sb03c_fig.dgn 07-JAN-2003 08:46:55

PORT OF SEATTLE

SASA

148
147
146
145
144
143
142
141
140
A3
A2

LEGEND

- POTENTIAL NOISE BARRIER
- ROADWAY
- EXISTING NOISE BARRIER
- 99 NOISE RECEIVER LOCATION
- A2 AIRPORT NOISE MONITORING LOCATION

0 200 400 600
Scale In Feet

N

PRELIMINARY

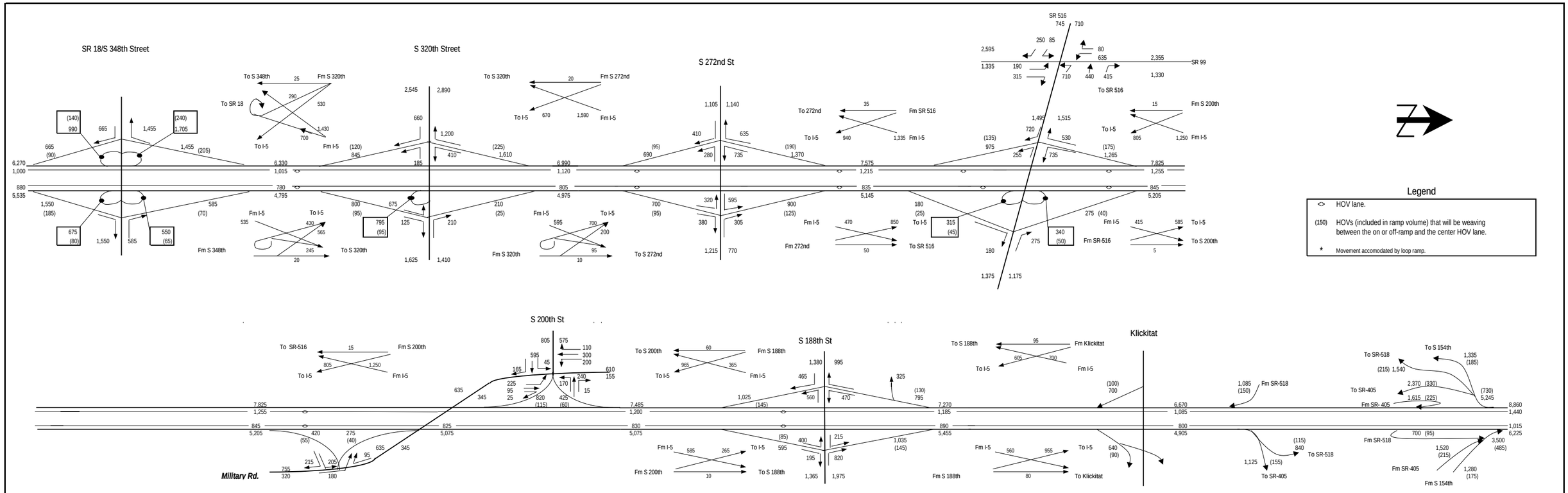
CH2MHILL

Washington State Department of Transportation

FIGURE 21

NOISE RECEIVERS AND POTENTIAL NOISE BARRIER LOCATIONS
SR 509
PREFERRED ALTERNATIVE

FILE NAME: sb04c_fig.dgn 07-JAN-2003 09:54:03

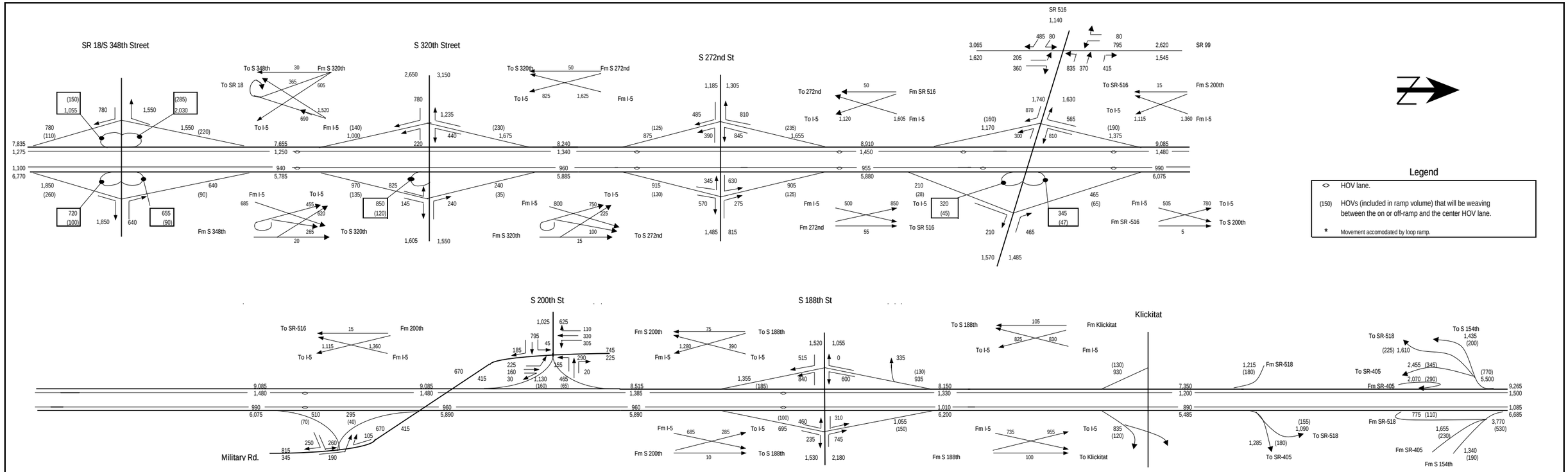


ATTACHMENT FIGURE A-1

Estimated No-Build 2003 PM Peak Hour Traffic Volumes

SR 509/South Access Road
Access Point Decision Report

01/10/2003
4:04 PM



Legend

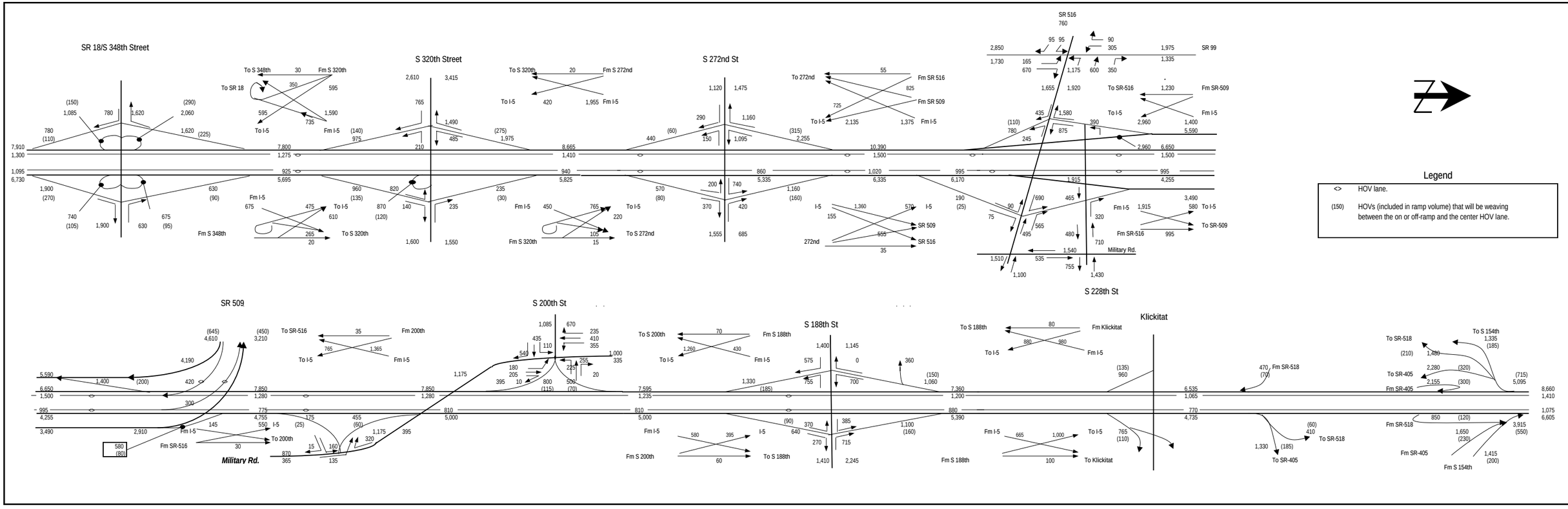
<>	HOV lane.
(150)	HOVs (included in ramp volume) that will be weaving between the on or off-ramp and the center HOV lane.
*	Movement accomodated by loop ramp.

ATTACHMENT FIGURE A-2

Estimated No-Build 2020 PM Peak Hour Traffic Volumes

SR 509/South Access Road
Access Point Decision Report

01/10/2003
4:06 PM



ATTACHMENT FIGURE A-3

Estimated Preliminary Preferred Alternative 2 Peak Hour Traffic Volumes

SR 509/South Access Road
Access Point Decision Report

01/10/2003
4:10 PM

ATTACHMENT TABLE B-1
Airport Noise Monitoring Results at Location A1

A1: 2406 S. 207th Street						
Record #	**Date**	**Time**	**Duration**	**Leq**	**Lmin**	**Lmax**
1	11-Jul-02	11:15:51	0:44:08	56.2	38.5	72.7
2	11-Jul-02	12:00:00	1:00:00	56	38.5	71.8
3	11-Jul-02	13:00:00	1:00:00	56.3	38.8	74.9
4	11-Jul-02	14:00:00	1:00:00	55.9	40.1	72.9
5	11-Jul-02	15:00:00	1:00:00	55.6	38.9	71.8
6	11-Jul-02	16:00:00	1:00:00	56.5	38.9	75.9
7	11-Jul-02	17:00:00	1:00:00	54.8	38.8	70.2
8	11-Jul-02	18:00:00	1:00:00	58.4	39.2	84.7
9	11-Jul-02	19:00:00	1:00:00	56.9	38.8	72.8
10	11-Jul-02	20:00:00	1:00:00	55.5	39.8	70.7
11	11-Jul-02	21:00:00	1:00:00	57.8	42.3	73.7
12	11-Jul-02	22:00:00	1:00:00	55.4	44.8	69.5
13	11-Jul-02	23:00:00	1:00:00	54.0	43.4	70.8
14	12-Jul-02	0:00:00	1:00:00	51.9	42.3	70.6
15	12-Jul-02	1:00:00	1:00:00	50.0	37.4	69.6
16	12-Jul-02	2:00:00	1:00:00	53.0	36.3	75.7
17	12-Jul-02	3:00:00	1:00:00	53.8	38.3	75.5
18	12-Jul-02	4:00:00	1:00:00	51.5	41.5	70.3
19	12-Jul-02	5:00:00	1:00:00	59.4	42.7	78.5
20	12-Jul-02	6:00:00	1:00:00	55.7	43.2	76.2
21	12-Jul-02	7:00:00	1:00:00	53.8	40.9	71
22	12-Jul-02	8:00:00	1:00:00	56.6	39.7	73
23	12-Jul-02	9:00:00	1:00:00	56.0	39.7	72
24	12-Jul-02	10:00:00	1:00:00	57.7	39.7	73.1
25	12-Jul-02	11:00:00	1:00:00	60.2	37.5	88.4
26	12-Jul-02	12:00:00	1:00:00	55.7	39.8	70.7
27	12-Jul-02	13:00:00	1:00:00	56.4	39.9	72.1
28	12-Jul-02	14:00:00	1:00:00	56.2	39.6	70.7
29	12-Jul-02	15:00:00	1:00:00	57.7	40.2	76
30	12-Jul-02	16:00:00	1:00:00	57.5	38.8	78.4
31	12-Jul-02	17:00:00	1:00:00	56.8	38.7	76.6
32	12-Jul-02	18:00:00	1:00:00	55.9	37.3	73.1
33	12-Jul-02	19:00:00	1:00:00	57.2	40.3	72.5
34	12-Jul-02	20:00:00	1:00:00	56.6	42.6	79.4
35	12-Jul-02	21:00:00	1:00:00	57.0	44.1	71
36	12-Jul-02	22:00:00	1:00:00	56.3	42.3	72.5
37	12-Jul-02	23:00:00	1:00:00	54.8	40.5	71
38	13-Jul-02	0:00:00	1:00:00	55.3	38.4	73.4
39	13-Jul-02	1:00:00	1:00:00	53.3	41.7	71.9

ATTACHMENT TABLE B-1
Airport Noise Monitoring Results at Location A1

A1: 2406 S. 207th Street						
Record #	**Date**	**Time**	**Duration**	**Leq**	**Lmin**	**Lmax**
40	13-Jul-02	2:00:00	1:00:00	52.4	37.5	73.9
41	13-Jul-02	3:00:00	1:00:00	46.7	36.4	70.7
42	13-Jul-02	4:00:00	1:00:00	53.2	35.2	72.9
43	13-Jul-02	5:00:00	1:00:00	55.7	38.2	76.1
44	13-Jul-02	6:00:00	1:00:00	67.8	43.7	85.3
45	13-Jul-02	7:00:00	1:00:00	68.1	40.5	84.7
46	13-Jul-02	8:00:00	1:00:00	66.9	39.2	88.1
47	13-Jul-02	9:00:00	1:00:00	55.2	36.1	70
48	13-Jul-02	10:00:00	1:00:00	57.9	37.5	75.3
49	13-Jul-02	11:00:00	1:00:00	64.3	36.2	85.5
50	13-Jul-02	12:00:00	1:00:00	69.6	34.7	88.1
51	13-Jul-02	13:00:00	1:00:00	68.1	39.5	85.8
52	13-Jul-02	14:00:00	1:00:00	70.4	37.5	92.7
53	13-Jul-02	15:00:00	1:00:00	58.7	40.7	78.2
54	13-Jul-02	16:00:00	1:00:00	53.9	35.4	71.6
55	13-Jul-02	17:00:00	1:00:00	55.4	37.8	73.3
56	13-Jul-02	18:00:00	1:00:00	63.8	36.3	84.6
57	13-Jul-02	19:00:00	1:00:00	67.0	38.5	85.9
58	13-Jul-02	20:00:00	0:48:50	67.4	40.8	87.4

Highlighting indicates likely times when future peak-hour traffic on SR 509 would occur.

ATTACHMENT TABLE B-2
Airport Noise Monitoring Results at Location A2

A2: 1243 S. 196th Place						
Record #	**Date**	**Time**	**Duration**	**Leq**	**Lmin**	**Lmax**
1	11-Jul-02	12:08:40	0:51:19	59.0	45.8	75.3
2	11-Jul-02	13:00:00	1:00:00	60.8	48.1	80.9
3	11-Jul-02	14:00:00	1:00:00	63.5	48.3	82.6
4	11-Jul-02	15:00:00	1:00:00	63.0	51.5	82.6
5	11-Jul-02	16:00:00	1:00:00	60.8	51.4	77.3
6	11-Jul-02	17:00:00	1:00:00	61.9	49.6	79.8
7	11-Jul-02	18:00:00	1:00:00	60.8	46.1	78.8
8	11-Jul-02	19:00:00	1:00:00	62.2	45.2	82.8
9	11-Jul-02	20:00:00	1:00:00	61.3	46.1	77.3
10	11-Jul-02	21:00:00	1:00:00	66.8	46.3	84.9
11	11-Jul-02	22:00:00	1:00:00	65.7	50.1	83.7
12	11-Jul-02	23:00:00	1:00:00	64.1	47.4	86.1
13	12-Jul-02	0:00:00	1:00:00	59.5	44.4	81.7
14	12-Jul-02	1:00:00	1:00:00	55.2	44.1	77.6
15	12-Jul-02	2:00:00	1:00:00	66.6	44.0	90.1
16	12-Jul-02	3:00:00	1:00:00	51.2	43.6	69.6
17	12-Jul-02	4:00:00	1:00:00	58.2	41.5	83.3
18	12-Jul-02	5:00:00	1:00:00	62.6	46.2	87.0
19	12-Jul-02	6:00:00	1:00:00	63.7	49.8	80.5
20	12-Jul-02	7:00:00	1:00:00	60.7	48.3	81.7
21	12-Jul-02	8:00:00	1:00:00	61.1	47.6	78.7
22	12-Jul-02	9:00:00	1:00:00	59.7	45.1	77.1
23	12-Jul-02	10:00:00	1:00:00	60.2	47.2	74.5
24	12-Jul-02	11:00:00	1:00:00	60.1	44.6	76.9
25	12-Jul-02	12:00:00	1:00:00	61.4	47.8	83.0
26	12-Jul-02	13:00:00	1:00:00	62.5	47.1	80.6
27	12-Jul-02	14:00:00	1:00:00	60.1	47.9	76.4
28	12-Jul-02	15:00:00	1:00:00	63.8	49.1	84.6
29	12-Jul-02	16:00:00	1:00:00	62.4	48.1	83.1
30	12-Jul-02	17:00:00	1:00:00	59.4	46.7	75.5
31	12-Jul-02	18:00:00	1:00:00	61.0	47.3	77.6
32	12-Jul-02	19:00:00	1:00:00	63.7	49.0	81.1
33	12-Jul-02	20:00:00	1:00:00	61.9	49.9	80.3
34	12-Jul-02	21:00:00	1:00:00	67.1	52.6	84.9
35	12-Jul-02	22:00:00	1:00:00	64.7	48.5	82.1
36	12-Jul-02	23:00:00	1:00:00	65.7	46.8	87.7
37	13-Jul-02	0:00:00	1:00:00	60.1	45.1	81.1
38	13-Jul-02	1:00:00	1:00:00	57.1	43.0	79.1

ATTACHMENT TABLE B-2
Airport Noise Monitoring Results at Location A2

A2: 1243 S. 196th Place						
Record #	**Date**	**Time**	**Duration**	**Leq**	**Lmin**	**Lmax**
39	13-Jul-02	2:00:00	1:00:00	61.8	42.2	85.4
40	13-Jul-02	3:00:00	1:00:00	54.2	40.9	74.9
41	13-Jul-02	4:00:00	1:00:00	54.5	41.1	76.7
42	13-Jul-02	5:00:00	1:00:00	56.6	42.1	74.9
43	13-Jul-02	6:00:00	1:00:00	67.7	46.4	84.1
44	13-Jul-02	7:00:00	1:00:00	68.4	44.9	84.7
45	13-Jul-02	8:00:00	1:00:00	66.8	42.0	88.0
46	13-Jul-02	9:00:00	1:00:00	57.0	40.1	75.2
47	13-Jul-02	10:00:00	1:00:00	61.9	42.3	79.6
48	13-Jul-02	11:00:00	1:00:00	63.6	39.1	82.7
49	13-Jul-02	12:00:00	1:00:00	68.1	40.5	84.6
50	13-Jul-02	13:00:00	1:00:00	67.5	46.6	84.4
51	13-Jul-02	14:00:00	1:00:00	70.2	47.1	86.3
52	13-Jul-02	15:00:00	1:00:00	69.7	47.5	76.8
53	13-Jul-02	16:00:00	1:00:00	68.5	48.2	75.5
54	13-Jul-02	17:00:00	1:00:00	69.0	51.6	78.1
55	13-Jul-02	18:00:00	1:00:00	71.2	50.5	82.1
56	13-Jul-02	19:00:00	1:00:00	70.4	50.3	81.0
57	13-Jul-02	20:00:00	1:00:00	70.8	51.4	83.5
58	13-Jul-02	21:00:00	0:02:43	74.1	64.6	77.7

Highlighting indicates likely times when future peak-hour traffic on SR 509 would occur. Measured noise levels during the afternoon of July 13 were contaminated by noise from festivities in the neighborhood, including loud sounds created by a live music band.

ATTACHMENT TABLE B-3
Airport Noise Monitoring Results at Location A3

A3. 1122 S. 194th Street (rooftop of building)						
Rec #	**Date**	**Time**	**Duration**	**Leq**	**Lmin**	**Lmax**
1	11-Jul-02	10:14:27	0:45:32	61.4	49.8	75.1
2	11-Jul-02	11:00:00	1:00:00	60.0	49.6	75.8
3	11-Jul-02	12:00:00	1:00:00	60.6	50.5	74.9
4	11-Jul-02	13:00:00	1:00:00	60.3	50.7	72.8
5	11-Jul-02	14:00:00	1:00:00	62.9	50.8	80.8
6	11-Jul-02	15:00:00	1:00:00	61.7	49.9	80.1
7	11-Jul-02	16:00:00	1:00:00	60.3	49.2	77.9
8	11-Jul-02	17:00:00	1:00:00	61.4	49.4	81.3
9	11-Jul-02	18:00:00	1:00:00	60.6	48.6	82.9
10	11-Jul-02	19:00:00	1:00:00	60.4	48.0	75.8
11	11-Jul-02	20:00:00	1:00:00	62.9	49.1	79.7
12	11-Jul-02	21:00:00	1:00:00	66.8	50.5	85.0
13	11-Jul-02	22:00:00	1:00:00	66.4	51.7	82.6
14	11-Jul-02	23:00:00	1:00:00	65.5	49.4	87.2
15	12-Jul-02	0:00:00	1:00:00	61.6	47.0	84.0
16	12-Jul-02	1:00:00	1:00:00	55.5	46.1	72.4
17	12-Jul-02	2:00:00	1:00:00	64.5	45.9	85.6
18	12-Jul-02	3:00:00	1:00:00	54.0	46.5	74.9
19	12-Jul-02	4:00:00	1:00:00	60.2	45.8	80.6
20	12-Jul-02	5:00:00	1:00:00	63.9	48.3	86.1
21	12-Jul-02	6:00:00	1:00:00	68.2	55.3	88.1
22	12-Jul-02	7:00:00	1:00:00	63.2	52.4	84.1
23	12-Jul-02	8:00:00	1:00:00	62.2	52.0	76.9
24	12-Jul-02	9:00:00	1:00:00	62.5	49.9	81.0
25	12-Jul-02	10:00:00	1:00:00	61.3	50.9	74.7
26	12-Jul-02	11:00:00	1:00:00	59.9	48.7	74.7
27	12-Jul-02	12:00:00	1:00:00	61.3	50.8	77.6
28	12-Jul-02	13:00:00	1:00:00	62.1	50.0	75.8
29	12-Jul-02	14:00:00	1:00:00	61.6	50.0	79.3
30	12-Jul-02	15:00:00	1:00:00	63.0	52.1	79.3
31	12-Jul-02	16:00:00	1:00:00	61.1	49.6	81.1
32	12-Jul-02	17:00:00	1:00:00	59.4	49.4	74.5
33	12-Jul-02	18:00:00	1:00:00	61.1	49.2	78.6
34	12-Jul-02	19:00:00	1:00:00	64.6	50.6	82.5
35	12-Jul-02	20:00:00	1:00:00	62.8	50.4	80.1
36	12-Jul-02	21:00:00	1:00:00	68.4	53.7	86.5
37	12-Jul-02	22:00:00	1:00:00	65.9	52.9	83.3
38	12-Jul-02	23:00:00	1:00:00	66.9	50.6	87.1

ATTACHMENT TABLE B-3
Airport Noise Monitoring Results at Location A3

A3. 1122 S. 194th Street (rooftop of building)						
Rec #	**Date**	**Time**	**Duration**	**Leq**	**Lmin**	**Lmax**
39	13-Jul-02	0:00:00	1:00:00	62.6	48.5	82.1
40	13-Jul-02	1:00:00	1:00:00	58.2	46.5	80.0
41	13-Jul-02	2:00:00	1:00:00	63.0	45.5	88.4
42	13-Jul-02	3:00:00	1:00:00	56.5	41.3	79.4
43	13-Jul-02	4:00:00	1:00:00	54.2	42.4	72.4
44	13-Jul-02	5:00:00	1:00:00	58.1	43.9	77.8
45	13-Jul-02	6:00:00	1:00:00	68.5	49.5	85.3
46	13-Jul-02	7:00:00	1:00:00	68.9	46.7	85.5
47	13-Jul-02	8:00:00	1:00:00	66.6	45.6	87.3
48	13-Jul-02	9:00:00	1:00:00	57.8	43.8	76.2
49	13-Jul-02	10:00:00	1:00:00	61.9	48.4	77.9
50	13-Jul-02	11:00:00	1:00:00	64.3	47.2	83.8
51	13-Jul-02	12:00:00	1:00:00	68.1	47.8	83.2
52	13-Jul-02	13:00:00	1:00:00	67.7	49.1	84.0
53	13-Jul-02	14:00:00	1:00:00	66.5	46.4	83.1
54	13-Jul-02	15:00:00	1:00:00	58.7	46.6	72.0
55	13-Jul-02	16:00:00	1:00:00	55.7	42.9	69.8
56	13-Jul-02	17:00:00	1:00:00	56.9	43.4	75.6
57	13-Jul-02	18:00:00	1:00:00	63.6	44.8	83.9
58	13-Jul-02	19:00:00	1:00:00	65.7	43.0	83.3
59	13-Jul-02	20:00:00	0:18:46	64.6	43.4	82.3

Highlighting indicates likely times when future peak-hour traffic on SR 509 would occur.