APPENDIX A
NOISE MEASUREMENT AND MODEL VALIDATION DATA

I. Noise Measurement and Model Validation

Ambient noise levels were measured for 15-minute periods at 18 locations near the study area to describe the existing noise environment, identify major noise sources in the study area, validate the noise model, and characterize weekday background environmental noise levels. Measurement locations characterize the variety of noise conditions and represent other sensitive receptors near the proposed project.

The I-405 Team's noise specialists exported base maps and design files from MicroStation as DXF files and imported them into the TNM package. Major roadways, topographical features, buildings, and sensitive receptors from the MicroStation files were digitized into the TNM. Elevations were added from the 2-foot contour data. Elevations for planned improvements were taken from design profiles, proposed cross-sections, and proposed cut-and-fill limits.

Eighteen measured sites were chosen to represent noise-sensitive sites in the study area. Fifteen-minute noise measurements were taken at each of these 18 sites to estimate the L_{eq}(h), as shown in Exhibit A-1. The measured sites represent approximately 77 single-family residences and multi-family units, 1 park, and 1 library. For noise model validation, traffic volumes were adjusted to match field counts during the time of day the noise measurement occurred. Additional topographical and geometrical detail was added to the TNM model, until the model results at each of the 18 measurement sites were within 2 dBA of the measured levels for the model's validation run.

The following hotels were not considered in the noise analysis due to the lack of ground-floor outdoor use: the Renton Travel Lodge, Springhill Suites Marriot, Hilton Garden Hotel, and Larkspur Landing (all located west of SR 167); and the Hampton Inn and Homestead Studio Suites Hotel (located south of I-405 at SR 181). Noise levels at outdoor use areas at the Nelson House, located south of I-405 at SR 181, are predicted to be below the NAC with the project. The Holiday Inn, located northeast of the I-405/SR 167 interchange, has an outdoor use area in the center of the building, but this area was not considered in the noise analysis because traffic noise levels from I-405 were observed to be well below the NAC. The Best Western Inn South Center will be acquired.

Valley Medical Center was visited during field activities. Traffic noise levels at this medical center were observed to be well below the NAC during field reconnaissance activities.

Exhibit A-1: Noise Measurement Summary

Receptor Number	Location	Date	Time	Leq
8	1503 Lake Avenue S	March 10, 2005	2:10 PM	68.1
9	1514 Lake Avenue S	March 10, 2005	2:10 PM	61.5
20	3521 Shattuck Avenue S	March 10, 2005	1:25 PM	66.8
21	402 S 36th Street	March 10, 2005	1:25 PM	58.7
22	301 S 14th Street	March 8, 2005	10:05 AM	68.8
30	1306 Smithers Avenue S	March 8, 2005	2:00 PM	70.4
32	1114 Benson Road S	March 22, 2005	12:45 PM	69.7
33	Berkshire Apartments (Bldg. P)	March 22, 2005	12:10 PM	68.0
37	518 Cedar Avenue S	March 8, 2005	2:30 PM	59.4
38	520 Mill Avenue S	March 8, 2005	11:15 AM	67.7
40	509 S Main Street	March 8, 2005	11:35 AM	72.0
41	522 Well Avenue S	March 22, 2005	11:15 AM	60.7
43	412 Mill Avenue S	March 8, 2005	3:25 PM	65.9
49	Freeway Park	March 22, 2005	10:15 AM	73.9
54	Renton Public Library	March 22, 2005	10:40 AM	63.8
55*	Liberty Park	November 3, 2003	11:30 AM	65.0
56*	Liberty Park	November 3, 2003	11:30 AM	68.0
57*	Cedar River Park	November 3, 2003	12:09 PM	68.0

* Sites were analyzed as a part of the I-405 Renton to Bellevue Project

II. Description of Measurement Locations

The measurement represented by Receptor 8 is located in the backyard of the property at 1503 Lake Avenue S, facing SR 167. The measurement was taken approximately 300 feet from the eastern edge of the SR 167 off-ramp to northbound I-405. Receptor 8 is located approximately 50 feet above the elevation of the nearest SR 167/I-405 interchange roadways. Receptor 8 is representative of five residences.

The measurement represented by Receptor 9 is located in the front yard of the property at 1514 Lake Avenue S, facing SR 167. The measurement was taken approximately 500 feet from the eastern edge of SR 167 and approximately 60 feet higher than the nearest SR 167/I-405 interchange roadways. Receptor 9 is representative of 3 residences.

The measurement represented by Receptor 20 is located in the backyard of the property at 3521 Shattuck Avenue S, facing SR 167. The measurement was taken approximately 500 feet from the eastern edge of SR 167. Receptor 20 is representative of 10 residences.

The measurement represented by Receptor 21 is located in the front yard of the property at 402 S 36th Street, facing SR 167. The measurement was taken approximately 650 feet from the eastern edge of SR 167. Receptor 21 is representative of 9 residences.

The measurement represented by Receptor 22 is located in the front yard of the property at 301 S 14th Street, facing I-405. The measurement was taken approximately 100 feet from the southern edge of I-405 and approximately 45 feet above two I-405 northbound on-ramps. Receptor 22 is representative of 8 residences.

The measurement represented by Receptor 30 is located in the front yard of the property at 1306 Smithers Avenue S, facing I-405. The measurement was taken approximately 50 feet from the southern edge of I-405 and is one of the nearest properties to I-405 along the study area. Receptor 30 is representative of 2 residences.

The measurement represented by Receptor 32 is located in the side yard of the property at 1114 Benson Road S, facing I-405. The measurement was taken approximately 400 feet from the southeastern edge of I-405. Receptor 32 is representative of 4 residences.

The measurement represented by Receptor 33 is located at a ground-floor outdoor use area at building P of the Berkshire Apartments at 1300 Eagle Ridge Drive S. The measurement was taken approximately 200 feet from the eastern edge of I-405, in the grassy lawn west of the building facing I-405. Receptor 33 is representative of 6 ground-floor apartment units and an adjacent single-family residence.

The measurement represented by Receptor 37 is located in an elevated front yard and swimming pool area on the first-floor ground-level of a single-family residence on the property at 518 Cedar Avenue S, facing I-405. The measurement was taken approximately 400 feet from the eastern edge of I-405. This receptor is located approximately 45 feet above I-405 and is partially shielded by the retaining wall alongside I-405. Receptor 37 is representative of 10 residences.

The measurement represented by Receptor 38 is located in an elevated front yard on the first-floor ground level of a single-family residence on the property at 520 Mill Avenue S, facing I-405. The measurement was taken approximately 100 feet from the eastern edge of I-405. This receptor is located approximately 30 feet above I-405 and is partially shielded by the retaining wall alongside I-405. Receptor 38 is representative of 5 residences.

The measurement represented by Receptor 40 is located in front of the property at 509 Main Avenue S. The measurement was taken approximately 150 feet from the western edge of I-405. Receptor 40 is representative of 3 residences.

The measurement represented by Receptor 41 is located in the backyard of the property at 522 Well Avenue S. The measurement was taken approximately 300 feet from the western edge of I-405. Receptor 41 is representative of 7 residences.

The measurement represented by Receptor 43 is located in the front yard of the property facing I-405 at 412 Mill Avenue S. The measurement was taken approximately 75 feet from the eastern edge of I-405. This receptor is located approximately 30 feet above I-405 and is partially shielded by the retaining wall separating the Renton Hill neighborhood from I-405. Receptor 43 is representative of 7 residences.

The measurement represented by Receptor 49 is located at Freeway Park, just west of I-405 between the Renton Avenue S and Cedar Avenue S underpasses at I-405. The measurement

was taken approximately 30 feet from the western edge of I-405, in the center of the benched area facing I-405. Receptor 49 is representative of 1 residential equivalent unit (see Exhibit B-3 in Appendix B).

The measurement represented by Receptor 54 is located at the Renton Public Library at 100 Mill Avenue S. The measurement was taken approximately 500 feet from the western edge of I-405, on the Cedar River Bridge just outside the library entrance. Receptor 54 is representative of 10 residential equivalent units (see Exhibit B-3 in Appendix B).

III. Validation Results

Exhibit A-2. Measured Noise Levels and Validation Traffic Noise Model (TNM) Outputs

Receptor Number	Address	Measured Leq	Modeled Leq
8	1503 Lake Avenue S	68.1	69
9	1514 Lake Avenue S	61.5	63
20	3521 Shattuck Avenue S	66.8	67
21	402 S 36th Street	58.7	59
22	301 S 14th Street	68.8	68
30	1306 Smithers Avenue S	70.4	71
32	1114 Benson Road S	69.7	69
33	Berkshire Apartments (Bldg. P)	68.0	68
37	518 Cedar Avenue S	59.4	59
38	520 Mill Avenue S	67.7	68
40	509 S Main Street	72.0	71
41	522 Well Avenue S	60.7	62
43	412 Mill Avenue S	65.9	66
49	Freeway Park	73.9	74
54	Renton Public Library	63.8	64
55*	Liberty Park	65.0	65
56*	Liberty Park	68.0	69
57*	Cedar River Park	68.0	68

* Sites were analyzed as a part of the I-405 Renton to Bellevue Project

Exhibit A-2 shows that measured values are all within 2 dBA of the modeled values for each site. These results validate the model.