Appendix G

Noise Assessment Worksheets

Project-Generated Construction Source Noise Prediction Model - Pile Driving

VA Alameda

Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L_{eq} dBA)
Threshold*	157	75.0
	30	93.3
	100	79.5
	150	74.9
	200	71.6
	250	69.0
	300	66.9
	350	65.2
	400	63.6
	450	62.3
	500	61.1
	550	60.0
	3700	38.2

Assumptions:	Reference Emission Noise Levels (L_{eq}) at 50 feet[1]	Usage Factor[1]
Impact Pile Driver	94.0	0.2
Front End Loader	75.0	0.4
Flat Bed Truck	70.0	0.4
Generator	78.0	0.5

Ground Type	Soft
Source Height	8
Receiver Height	5
Ground Factor	0.63

Predicted Noise Level [2]	L_{eq} dBA at 50 feet[2]
Impact Pile Driver	87.0
Front End Loader	71.0
Flat Bed Truck	66.0
Generator	75.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
87.4

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006.

[2] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

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

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

*Project specific threshold

Project-Generated Construction Source Noise Prediction Model

VA Alameda

Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L_{eq} dBA)
Threshold*	62	75.0
	50	77.3
	100	69.4
	150	64.8
	200	61.5
	250	58.9
	300	56.8
	350	55.1
	400	53.5
	450	52.2
	500	51.0
	550	49.9
	3700	28.1

Assumptions:	Reference Emission Noise Levels (L_{eq}) at 50 feet[1]	Usage Factor[1]
Crane	73.0	0.16
Front End Loader	75.0	0.4
Dozer	78.0	0.4
Concrete Mixer Truck	75.0	0.4

Ground Type	Soft
Source Height	8
Receiver Height	5
Ground Factor	0.63

Predicted Noise Level [2]	L_{eq} dBA at 50 feet[2]
Crane	65.1
Front End Loader	71.0
Dozer	74.0
Concrete Mixer Truck	71.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
77.3

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006.

[2] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

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

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

*Project specific threshold

Project-Generated Construction Source Noise Prediction Model - Pile Driving - Lmax

VA Alameda

Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L_{max} dBA)
Threshold*	166	82.0
	30	100.8
	50	95.0
	70	91.2
	100	87.1
	150	82.4
	200	79.1
	250	76.6
	300	74.5
	350	72.7
	400	71.2
	450	69.9
	3700	45.8

Assumptions:	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Impact Pile Driver	95	0.2
Generator	82	0.5
Flat Bed Truck	84	0.4
Front End Loader	80	0.4

Ground Type	Soft
Source Height	8
Receiver Height	5
Ground Factor	0.63

Predicted Noise Level [2]	L_{max} dBA at 50 feet[2]
Impact Pile Driver	95.0
Generator	82.0
Flat Bed Truck	84.0
Front End Loader	80.0

Maximum Noise Level (L_{max} dBA at 50 feet)
95.0

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006.

[2] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

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

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

*Project specific threshold

Project-Generated Construction Source Noise Prediction Model - Lmax

VA Alameda

Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L_{max} dBA)
Threshold*	66	82.0
	30	90.8
	50	85.0
	70	81.2
	100	77.1
	150	72.4
	200	69.1
	250	66.6
	300	64.5
	350	62.7
	400	61.2
	450	59.9
	3700	35.8

Assumptions:	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Crane	85	0.16
Dozer	85	0.4
Front End Loader	80	0.4
Concrete Mixer Truck	85	0.4

Ground Type	Soft
Source Height	8
Receiver Height	5
Ground Factor	0.63

Predicted Noise Level [2]	L_{max} dBA at 50 feet[2]
Crane	85.0
Dozer	85.0
Front End Loader	80.0
Concrete Mixer Truck	85.0

Maximum Noise Level (L_{max} dBA at 50 feet)
85.0

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006.

[2] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

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

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

*Project specific threshold

Project-Generated Construction Source Vibration Prediction Model

VA Alameda

Location	Distance to Nearest Receiver in feet	Predicted Vibration Level (PPV)	Predicted Vibration Level (VdB)	Equipment	Reference Distance	PPV at 25 feet (in/sec)[1]	Approximate Lv (VdB) at 25 feet[2]
Distance to Impact	45	0.037	79.3	Large Bulldozer	25	0.089	87
Distance to Impact	15	0.191	93.6	Large Bulldozer	25	0.089	87
Distance to Impact	100	0.190	93.5	Pile Driver (impact)	25	1.518	112
Distance to Impact	45	0.037	79.3	Pile Driver (impact)	25	1.518	112

Sources:

[1] Where PPV is the peak particle velocity

[2] Where Lv is the RMS velocity expressed in vibration decibels (VdB), assuming a crest factor of 4.

Source: Caltrans 2002, FTA 2006

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

Project Name : VA Alameda
Project Number :
Modeling Condition : Existing
Ground Type : Hard
K Factor : 10
Metric (L_{eq}, L_{dn}, CNEL) : Ldn
Traffic Desc. (Peak or ADT) : Peak

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
1	Atlantic Avenue	Webster Street	Main Street	932	35	100	91	3	6	85	5	10	0
2	Willie Stargell Avenue	Webster Street	Main Street	785	25	100	91	3	6	85	5	10	0
3	Main Street	Atlantic Avenue	Willie Stargell Avenue	349	35	100	91	3	6	85	5	10	0
4	Webster Ave	Atlantic Avenue	Willie Stargell Avenue	1,918	35	100	91	3	6	85	5	10	0
5	Webster Ave	Willie Stargell Avenue	North	2,550	35	100	91	3	6	85	5	10	

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

Project Name : VA Alameda
Project Number :
Modeling Condition : Existing
Metric (Leq, Ldn, CNEL) : Ldn

		Segment		Noise Levels, dB Ldn				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	Atlantic Avenue	Webster Street	Main Street	59.6	54.4	62.6	64.8	30	95	301	952	3010
2	Willie Stargell Avenue	Webster Street	Main Street	54.6	51.4	62.0	63.1	20	64	202	640	2025
3	Main Street	Atlantic Avenue	Willie Stargell Avenue	55.3	50.2	58.4	60.5	11	36	113	356	1127
4	Webster Ave	Atlantic Avenue	Willie Stargell Avenue	62.7	57.6	65.8	67.9	62	196	619	1959	6194
5	Webster Ave	Willie Stargell Avenue	North	63.9	58.8	67.0	69.2	82	260	823	2604	8235

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

Project Name : VA Alameda
Project Number :
Modeling Condition : Existing Plus Project
Ground Type : Hard
K Factor : 10
Metric (L_{eq}, L_{dn}, CNEL) : Ldn
Traffic Desc. (Peak or ADT) : Peak

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
1	Atlantic Avenue	Webster Street	Main Street	1,127	35	100	91	3	6	85	5	10	0
2	Willie Stargell Avenue	Webster Street	Main Street	1,177	25	100	91	3	6	85	5	10	0
3	Main Street	Atlantic Avenue	Willie Stargell Avenue	587	35	100	91	3	6	85	5	10	0
4	Webster Ave	Atlantic Avenue	Willie Stargell Avenue	2,266	35	100	91	3	6	85	5	10	0
5	Webster Ave	Willie Stargell Avenue	North	3,144	35	100	91	3	6	85	5	10	0

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

Project Name : VA Alameda
Project Number :
Modeling Condition : Existing Plus Project
Metric (Leq, Ldn, CNEL) : Ldn

		Segment		Noise Levels, dB Ldn				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	Atlantic Avenue	Webster Street	Main Street	60.4	55.2	63.5	65.6	36	115	364	1151	3639
2	Willie Stargell Avenue	Webster Street	Main Street	56.4	53.2	63.8	64.8	30	96	304	960	3036
3	Main Street	Atlantic Avenue	Willie Stargell Avenue	57.5	52.4	60.6	62.8	19	60	190	599	1896
4	Webster Ave	Atlantic Avenue	Willie Stargell Avenue	63.4	58.3	66.5	68.6	73	231	732	2314	7317
5	Webster Ave	Willie Stargell Avenue	North	64.8	59.7	67.9	70.1	102	321	1015	3211	10153

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

AECOM

Project Name : VA Alameda
Project Number :
Modeling Condition : Existing Plus Project
Ground Type : Hard
K Factor : 10
Metric (L_{eq}, L_{dn}, CNEL) : Ldn
Traffic Desc. (Peak or ADT) : Peak

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
1	Atlantic Avenue	Webster Street	Main Street	1,486	35	100	91	3	6	85	5	10	0
2	Willie Stargell Avenue	Webster Street	Main Street	1,133	25	100	91	3	6	85	5	10	0
3	Main Street	Atlantic Avenue	Willie Stargell Avenue	688	35	100	91	3	6	85	5	10	0
4	Webster Ave	Atlantic Avenue	Willie Stargell Avenue	2,779	35	100	91	3	6	85	5	10	0
5	Webster Ave	Willie Stargell Avenue	North	3,619	35	100	91	3	6	85	5	10	0

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

Project Name : VA Alameda
Project Number :
Modeling Condition : Existing Plus Project
Metric (Leq, Ldn, CNEL) : Ldn

		Segment		Noise Levels, dB Ldn				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	Atlantic Avenue	Webster Street	Main Street	61.6	56.4	64.7	66.8	48	152	480	1517	4799
2	Willie Stargell Avenue	Webster Street	Main Street	56.2	53.0	63.6	64.7	29	92	292	924	2922
3	Main Street	Atlantic Avenue	Willie Stargell Avenue	58.2	53.1	61.3	63.5	22	70	222	703	2222
4	Webster Ave	Atlantic Avenue	Willie Stargell Avenue	64.3	59.2	67.4	69.5	90	284	897	2838	8974
5	Webster Ave	Willie Stargell Avenue	North	65.4	60.3	68.5	70.7	117	370	1169	3696	11687

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

Project Name : VA Alameda
Project Number :
Modeling Condition : 2035 Plus Project
Ground Type : Hard
K Factor : 10
Metric (L_{eq}, L_{dn}, CNEL) : Ldn
Traffic Desc. (Peak or ADT) : Peak

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
1	Atlantic Avenue	Webster Street	Main Street	1,566	35	100	91	3	6	85	5	10	0
2	Willie Stargell Avenue	Webster Street	Main Street	1,206	25	100	91	3	6	85	5	10	0
3	Main Street	Atlantic Avenue	Willie Stargell Avenue	879	35	100	91	3	6	85	5	10	0
4	Webster Ave	Atlantic Avenue	Willie Stargell Avenue	3,092	35	100	91	3	6	85	5	10	0
5	Webster Ave	Willie Stargell Avenue	North	3,824	35	100	91	3	6	85	5	10	0

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

Project Name : VA Alameda
Project Number :
Modeling Condition : 2035 Plus Project
Metric (Leq, Ldn, CNEL) : Ldn

		Segment		Noise Levels, dB Ldn				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	Atlantic Avenue	Webster Street	Main Street	61.8	56.7	64.9	67.0	51	160	506	1599	5057
2	Willie Stargell Avenue	Webster Street	Main Street	56.5	53.3	63.9	64.9	31	98	311	984	3111
3	Main Street	Atlantic Avenue	Willie Stargell Avenue	59.3	54.2	62.4	64.5	28	90	284	898	2838
4	Webster Ave	Atlantic Avenue	Willie Stargell Avenue	64.8	59.6	67.8	70.0	100	316	998	3157	9985
5	Webster Ave	Willie Stargell Avenue	North	65.7	60.6	68.8	70.9	123	390	1235	3905	12349

Project level Impact

Existing	2017 PP	Difference
64.8	65.6	0.8
63.1	64.8	1.8
60.5	62.8	2.3
67.9	68.6	0.7
69.2	70.1	0.9

Cumulative Impact

2035	2035 PP	Difference
66.8	67.0	0.2
64.7	64.9	0.3
63.5	64.5	1.1
69.5	70.0	0.5
70.7	70.9	0.2

Existing	2035 PP	Difference
64.8	67.0	2.3
63.1	64.9	1.9
60.5	64.5	4.0
67.9	70.0	2.1
69.2	70.9	1.8