APPENDIX 4

NOISE

Monitoring Noise Levels

Site	Location		Time	Leq	L1	L10	L50	L90
1	West 33rd Street between Eighth and Ninth Avenues	WD	AM	72.9	83.7	76.5	68.7	63.1
			MD	69.8	80.3	71.7	66.3	62.7
			PM	69.4	80.7	71.7	65.3	60.7
			LN	65.0	73.1	67.1	63.6	59.3
		WE	MD	64.1	70.0	66.4	62.8	60.0
			LN	61.7	67.7	64.0	60.8	58.7
2	Ninth Avenue between West 31st and West 33rd Streets	WD	AM	76.0	83.5	79.9	73.1	68.3
			MD	73.5	81.3	76.9	71.3	64.5
			PM	73.5	82.7	76.3	70.3	64.5
			LN	67.5	74.7	71.1	64.8	58.7
		WE	MD	69.8	78.6	73.8	66.0	62.6
			LN	68.3	75.0	72.8	64.6	58.3
3	West 31st Street between Eighth and Ninth Avenues	WD	AM	75.2	83.3	77.3	73.5	70.7
			MD	71.3	80.9	73.5	67.3	64.1
			PM	70.8	80.9	73.5	67.3	64.1
			LN	67.7	78.1	70.7	63.4	59.9
		WE	MD	65.5	73.4	67.6	64.2	60.6
			LN	68.3	78.5	71.9	62.6	59.0
4	West 33rd Street between Ninth and Tenth Avenues	WD	AM	68.8	80.0	71.0	65.0	62.0
			MD	67.5	75.5	69.5	66.0	63.5
			PM	68.4	76.0	71.5	66.0	63.5
			LN	65.0	73.1	67.1	63.6	59.3
		WE	MD	67.1	75.0	68.2	65.6	64.0
			LN	61.7	67.7	64.0	60.8	58.7
5	Tunnel across roadway (Medium of roadway) between West 31st and West 33rd Streets	WD	AM	76.1	82.5	79.0	74.5	70.5
			MD	76.6	84.5	80.5	73.5	67.0
			PM	82.6	90.0	86.0	80.5	72.0
			LN	69.3	78.7	73.1	65.3	61.0
		WE	MD	76.9	82.8	79.8	76.0	68.8
			LN	66.4	75.1	70.1	64.8	59.2
6	West 31st Street between Ninth and Tenth Avenues	WD	AM	71.4	81.5	73.5	69.5	66.0
			MD	68.4	75.5	71.5	66.5	64.5
			PM	69.3	77.5	71.5	66.5	64.0
			LN	62.0	66.5	63.4	61.6	59.8
		WE	MD	70.0	76.0	72.4	67.8	66.6
			LN	63.5	68.5	65.0	62.8	61.7
7	Eight Avenue between West 31st and West 33rd Streets	WD	AM	71.7	79.0	75.2	68.6	65.4
			MD	72.4	81.2	74.0	68.4	63.8
			PM	70.7	78.4	73.4	68.4	65.6
			LN	66.8	72.2	69.9	65.6	61.3
		WE	MD	69.1	78.0	71.2	66.4	63.2
			LN	66.2	73.0	70.3	63.2	57.9
8	West 33rd Street between Seventh and Eighth Avenues	WD	AM	66.9	74.0	68.8	65.4	64.0
			MD	66.9	73.4	68.6	65.8	64.6
			PM	68.8	79.6	68.6	66.0	64.2
			LN	64.7	69.7	66.3	64.1	62.6
		WE	MD	66.0	72.2	67.4	64.0	62.6
			LN	65.6	77.0	67.1	60.7	59.4
9	Seventh Avenue between West 31st and West 33rd Streets	WD	AM	71.2	78.4	73.0	69.6	67.2
			MD	70.8	79.4	72.6	69.2	66.8
			PM	71.5	77.8	73.4	70.6	68.4
			LN	73.5	80.2	76.7	72.1	68.5
		WE	MD	70.1	77.0	72.2	68.8	65.6
			LN	70.7	78.0	73.2	69.4	65.0
10	West 31st Street between Seventh and Eighth Avenues	WD	AM	68.4	74.2	69.6	67.0	66.2
			MD	68.2	74.8	69.6	67.0	65.8
			PM	68.3	73.2	69.8	67.4	66.0
			LN	65.0	73.1	67.1	63.6	59.3
		WE	MD	67.4	72.0	68.6	66.8	65.8
			LN	61.7	67.7	64.0	60.8	58.7
11	Eighth Avenue between West 33rd and West 34th Streets	WD	AM	72.5	79.2	75.6	70.6	66.8
			MD	73.3	79.6	76.4	71.8	68.4
			PM	72.8	79.6	75.8	70.6	67.4
			LN	73.6	80.5	77.9	70.1	67.5
		WE	MD	72.5	79.6	75.4	70.8	67.2
			LN	71.7	79.3	75.1	69.5	65.4
12	West 34th Street between Seventh and Eighth Avenues	WD	AM	75.1	84.8	77.8	71.2	65.8
			MD	72.3	81.2	75.6	69.4	66.6
			PM	74.9	85.4	76.8	71.4	68.2
			LN	73.6	80.5	77.9	70.1	67.5
		WE	MD	69.0	75.2	71.4	67.6	65.6
			LN	70.1	78.6	73.2	67.9	63.9

Moynihan/Pen Station Weekday Noise Analysis Results

Receptor Site	Existing L_{eq}/L_{dn}	FTA Land Use	Moderate Impact L_{eq}/L_{dn}	Severe Impact L_{eq}/L_{dn}	No Build					Build				
					Project Noise	Moderate Impact	Severe Impact	Actual Leq/Ldn	Change	Project Noise	Moderate Impact	Severe Impact	Actual Leq/Ldn	Change
1	70.8	2	65.0	70.1	58.3	NO	NO	71.0	0.2	59.9	NO	NO	71.1	0.3
2	76.0	3	70.0	79.0	57.7	NO	NO	76.1	0.1	59.1	NO	NO	76.1	0.1
3	75.2	3	70.0	78.4	54.8	NO	NO	75.2	0.0	57.4	NO	NO	75.3	0.1
4	69.9	2	64.3	69.4	56.2	NO	NO	70.1	0.2	57.6	NO	NO	70.1	0.2
5	76.1	3	70.0	79.1	45.8	NO	NO	76.1	0.0	50.7	NO	NO	76.1	0.0
6	68.5	2	63.2	68.5	57.3	NO	NO	68.8	0.3	59.1	NO	NO	69.0	0.5
7	71.7	3	70.0	75.7	57.7	NO	NO	71.9	0.2	58.2	NO	NO	71.9	0.2
8	66.9	3	67.1	72.4	48.2	NO	NO	67.0	0.1	54.1	NO	NO	67.1	0.2
9	77.6	2	65.0	75.0	60.8	NO	NO	77.7	0.1	61.4	NO	NO	77.7	0.1
10	68.4	3	68.2	73.4	54.9	NO	NO	68.6	0.2	55.4	NO	NO	68.6	0.2
11	72.5	3	70.0	76.3	54.7	NO	NO	72.6	0.1	55.7	NO	NO	72.6	0.1
12	77.9	2	65.0	75.0	59.7	NO	NO	78.0	0.1	61.0	NO	NO	78.0	0.1

Moynihan/Pen Station Weekend Noise Analysis Results

Receptor Site	Existing L_{eq}/L_{dn}	FTA Land Use	Moderate Impact L_{eq}/L_{dn}	Severe Impact L_{eq}/L_{dn}	No Build					Build				
					Project Noise	Moderate Impact	Severe Impact	Actual Leq/Ldn	Change	Project Noise	Moderate Impact	Severe Impact	Actual Leq/Ldn	Change
1	66.5	2	61.8	67.1	54.6	NO	NO	66.8	0.3	57.0	NO	NO	67.0	0.5
2	68.8	3	68.5	73.6	54.2	NO	NO	68.9	0.1	55.4	NO	NO	69.0	0.2
3	64.5	3	65.5	70.9	50.5	NO	NO	64.6	0.2	52.0	NO	NO	64.7	0.2
4	67.4	2	62.5	67.7	53.3	NO	NO	67.6	0.2	55.3	NO	NO	67.7	0.3
5	75.9	3	70.0	78.9	41.5	NO	NO	75.9	0.0	45.1	NO	NO	75.9	0.0
6	69.7	2	64.1	69.3	57.5	NO	NO	70.0	0.3	58.5	NO	NO	70.0	0.3
7	68.1	3	67.9	73.2	53.0	NO	NO	68.2	0.1	54.0	NO	NO	68.2	0.2
8	65.0	3	65.8	71.2	47.7	NO	NO	65.1	0.1	51.3	NO	NO	65.2	0.2
9	75.0	2	65.0	73.2	60.9	NO	NO	75.2	0.2	61.3	NO	NO	75.2	0.2
10	66.4	3	66.7	72.1	49.0	NO	NO	66.5	0.1	50.2	NO	NO	66.5	0.1
11	71.5	3	70.0	75.5	52.8	NO	NO	71.5	0.1	53.7	NO	NO	71.5	0.1
12	74.4	2	65.0	72.7	58.5	NO	NO	74.5	0.1	59.4	NO	NO	74.5	0.1

For land use category 2, L_{dn} noise levels were calculated by the FTA equation (see page D-3 in the FTA Manaul, May 2006)

Ave. Project-Generated PCEs for No Build:

Weekday: Overnight Average = 0.58 * Midday

Weekend: Overnight Average = 0.73 * Midday

Ave. Project-Generated PCEs for Build Increment:

Weekday: Overnight Average = 0.10 * Midday

Weekend: Overnight Average = 0.10 * Midday

Traffic Input Data and Existing Noise Levels for Weeken

Receptor Location	Site	FTA Land Use	Hour	EXISTING CONDITIONS				NO BUILD				BUILD			
				Volume	PCEs	Leq(1)	Ldn	Volume	PCEs	Project-generated PCEs	Ave. Project-generated PCE	Total PCE's	Leq (1)	Project-generated PCEs	Ave. Project-generated PCE
West 33rd Street between Eighth Ave. and Ninth Ave.	1	2	AM	300	601	72.9	70.8	472	945	344	431	1361	76.5	761	842
			MD	410	1062	69.8		624	1616	554		2065	72.7	1003	
			PM	425	915	69.4		608	1309	394		1678	72.0	763	
			LN		892	65.0			1358	466	321	1515		623	422
Ninth Ave. between West 31st Street and West 33rd Street	2	3	AM	1715	4572	76.0		2193	5847	1274	1310	6340	77.4	1768	1777
			MD	1665	4535	73.5		2122	5780	1245		6409	75.0	1874	
			PM	1590	4675	73.5		2070	6086	1411		6365	74.8	1690	
			LN		3810	67.5			4855	1045	722	5076		1266	909
West 31st Street between Eighth Ave. and Ninth Ave.	3	3	AM	400	848	75.2		710	1505	657	477	2033	79.0	1185	938
			MD	465	961	71.3		666	1376	415		2078	74.6	1117	
			PM	790	1529	70.8		976	1889	360		2041	72.1	512	
			LN		807	67.7			1156	349	241	1401		594	353
West 33rd Street between Ninth Ave. and Tenth Ave.	4	2	AM	340	1321	68.8	69.9	476	1849	528	475	2082	70.8	761	695
			MD	350	1015	67.5		446	1293	278		1516	69.2	501	
			PM	410	1703	68.4		559	2322	619		2527	70.1	824	
			LN		852	65.0			1086	234	161	1164		312	212
Tunnel access roadway (Medium of roadway)	5	3	AM	915	1780	76.1		957	1862	82	169	2034	76.7	254	329
			MD	750	2302	76.6		796	2443	141		2668	77.2	366	
			PM	1190	3775	82.6		1280	4060	285		4142	83.0	367	
			LN		1933	69.3			2052	119	82	2131		198	118
West 31st Street between Ninth Ave. and Tenth Ave.	6	2	AM	270	572	71.4	68.5	670	1420	848	681	1876	76.6	1304	1075
			MD	350	723	68.4		513	1060	337		1632	71.9	909	
			PM	705	1364	69.3		1148	2221	857		2377	71.7	1013	
			LN		607	62.0			890	283	195	1090		483	286
Eighth Ave. between West 31st Street and West 33rd Street	7	3	AM	1565	4096	71.7		2047	5357	1261	1151	5520	73.0	1424	1336
			MD	1600	4122	72.4		1970	5075	953		5306	73.5	1185	
			PM	1630	4393	70.7		2090	5633	1240		5792	71.9	1399	
			LN		3462	66.8			4263	801	553	4344		882	671
West 33rd Street between Seventh Ave. and Eighth Ave.	8	3	AM	280	561	66.9		351	703	142	169	1121	69.9	560	574
			MD	300	777	66.9		371	961	184		1423	69.5	646	
			PM	360	775	68.8		444	956	181		1292	71.0	517	
			LN		653	64.7			807	154	107	969		316	171
Seventh Ave. between West 31st Street and West 33rd Street	9	2	AM	1350	2650	71.2	77.6	2087	4097	1447	1012	4097	73.1	1447	1012
			MD	1090	1807	70.8		1639	2717	910		2717	72.6	910	
			PM	1225	1861	71.5		1671	2539	678		2540	72.9	679	
			LN		1518	73.5			2282	764	528	2282		764	619
West 31st Street between Seventh Ave. and Eighth Ave.	10	3	AM	615	1304	68.4		929	1969	666	477	2049	70.4	745	566
			MD	390	806	68.2		539	1114	308		1251	70.1	445	
			PM	635	1229	68.3		871	1685	457		1735	69.8	507	
			LN		677	65.0			935	258	179	983		306	223
8th Ave. between West 33rd Street and West 34th Street	11	3	AM	1545	2589	72.5		1925	3226	637	586	3389	73.7	799	755
			MD	1490	2427	73.3		1816	2958	531		3196	74.5	769	
			PM	1565	2402	72.8		1950	2993	591		3100	73.9	698	
			LN		2039	73.6			2485	446	308	2568		529	385
West 34th St. Between 7th Ave. and 8th Ave.	12	2	AM	1310	4209	75.1	77.9	1686	5417	1208	942	5841	76.5	1632	1316
			MD	1495	3587	72.3		1772	4251	665		4789	73.6	1203	
			PM	1085	2698	74.9		1468	3651	953		3811	76.4	1113	
			LN		3013	69.0			3571	558	385	3759		746	506

values were calculated using proportional modeling techniques MD or PM Leq = (10*LOG((AM or PM PCEs)/MD PCEs))+MD or PM Leq)

For land use category 2, L_{dn} noise levels were calculated by the FTA equation (see page D-3 in the FTA Manaul, May 2006)

Ave. Project-Generated PCEs for No Build:

Weekday: Overnight Average = 0.58 * Midday

Weekend: Overnight Average = 0.73 * Midday

Ave. Project-Generated PCEs for Build Increment:

Weekday: Overnight Average = 0.10 * Midday

Weekend: Overnight Average = 0.10 * Midday

Traffic Input Data and Existing Noise Levels for Weeken

Receptor Location	Site	FTA Land Use	Hour	EXISTING CONDITIONS				NO BUILD				BUILD			
				Volume	PCEs	Leq(1)	Ldn	Volume	PCEs	Project-generated PCEs	Ave. Project-generated PCEs	Total PCE's	Leq (1)	Project-generated PCEs	Ave. Project-generated PCEs
West 33rd Street between Eighth Ave. and Ninth Ave.	1	2	AM	253	407	63.1	66.5	346	558	150	169	748		340	512
			MD	320	516	64.1		438	706	190		1148	67.6	632	
			PM	278	449	63.5		381	614	165		1012		563	
			LN	269	433	61.7		368	593	160	139	748		314	202
Ninth Ave. between West 31st Street and West 33rd Street	2	3	AM	1296	2751	68.8		1565	3322	572	642	3495		745	954
			MD	1640	3482	69.8		1981	4206	724		4608	71.0	1126	
			PM	1427	3029	69.2		1723	3659	630		4021		992	
			LN	1378	2925	68.3		1664	3533	608	528	3673		749	641
West 31st Street between Eighth Ave. and Ninth Ave.	3	3	AM	446	974	64.5		558	1217	243	273	1318		345	456
			MD	565	1233	65.5		706	1540	308		1776	67.1	544	
			PM	492	1073	64.9		614	1340	268		1553		480	
			LN	475	1036	68.3		593	1294	258	225	1377		341	279
West 33rd Street between Ninth Ave. and Tenth Ave.	4	2	AM	245	373	66.1	67.4	318	484	111	124	592		219	321
			MD	310	472	67.1		402	612	140		865	69.7	393	
			PM	270	411	66.5		350	533	122		760		350	
			LN	260	397	61.7		338	514	118	102	603		206	142
Tunnel access roadway (Medium of roadway)	5	3	AM	932	1237	75.9		955	1267	30	34	1307		70	106
			MD	1180	1565	76.9		1209	1604	38		1696	77.2	130	
			PM	1027	1362	76.3		1052	1395	33		1478		116	
			LN	991	1315	66.4		1016	1347	32	28	1379		65	41
West 31st Street between Ninth Ave. and Tenth Ave.	6	2	AM	450	593	69.0	69.7	674	887	294	330	970		378	481
			MD	570	750	70.0		853	1123	372		1317	72.4	566	
			PM	496	653	69.4		742	977	324		1151		499	
			LN	479	630	63.5		717	943	313	272	1011		381	329
Eighth Ave. between West 31st Street and West 33rd Street	7	3	AM	1276	2355	68.1		1508	2784	429	481	2901		545	692
			MD	1615	2981	69.1		1909	3524	543		3795	70.1	814	
			PM	1405	2594	68.5		1661	3066	472		3310		716	
			LN	1357	2504	66.2		1604	2960	456	396	3055		551	478
West 33rd Street between Seventh Ave. and Eighth Ave.	8	3	AM	245	504	65.0		307	632	128	144	797		293	442
			MD	310	638	66.0		389	801	163		1184	68.7	546	
			PM	270	555	65.4		338	696	141		1041		486	
			LN	260	536	65.6		327	672	137	119	807		271	173
Seventh Ave. between West 31st Street and West 33rd Street	9	2	AM	1122	2476	69.1	75.0	1408	3107	631	708	3107		631	708
			MD	1420	3134	70.1		1782	3933	799		3933	71.1	799	
			PM	1235	2727	69.5		1550	3422	695		3422		695	
			LN	1193	2633	70.7		1497	3304	671	583	3304		671	663
West 31st Street between Seventh Ave. and Eighth Ave.	10	3	AM	490	932	66.4		581	1104	173	194	1160		228	294
			MD	620	1179	67.4		735	1398	219		1527	68.5	348	
			PM	539	1026	66.8		639	1216	190		1332		306	
			LN	521	991	61.7		617	1174	184	160	1219		229	194
8th Ave. between West 33rd Street and West 34th Street	11	3	AM	1268	2597	71.5		1470	3011	414	465	3102		505	630
			MD	1605	3287	72.5		1861	3811	524		4023	73.4	736	
			PM	1396	2860	71.9		1619	3316	456		3507		647	
			LN	1348	2761	71.7		1563	3202	440	383	3276		515	456
West 34th St. Between 7th Ave. and 8th Ave.	12	2	AM	1225	2300	68.0	74.4	1419	2665	365	410	2756		456	574
			MD	1550	2912	69		1796	3374	462		3586	69.9	674	
			PM	1349	2533	68.4		1563	2935	402		3126		593	
			LN	1302	2446	68.2		1509	2834	388	337	2908		462	405

4.6 Weekday Detailed Caculation Spreadsheets

Methodology: Detailed Noise Analysis based on FTA Manual
Assumed average vehicle speed 25 mph.

NO BUILD - Leq (AM)

Calculate Hourly Daytime Leq:

	V=	344 vehicles
Project Increment		
Measured Level	Leq(day)=	72.9 dBA
Project-Generated Noise Level:		
Based on Table 6-6, FTA Manual, calculated Leq at 50ft.		
Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6		
Hourly Volume of Vehicles: V		
Cemissions Ce = 40 LOG(S/50), for autos	Ce=	-12 mph
Average Vehicle Speed: S	S=	25 mph
	SELref=	74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Hourly Project Noise Levels Leq: Leq(h)= 52.0 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 3 Leq						
Daytime	72.9	52.0	72.9	70.0	76.6	No Impact

Threshold of Impact - Land Use Category 3

L_E<42	Lp=	$16.450+0.953L_E$		
42<=L_E<=71	Lp=	$76.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	71.6
L_E >71	Lp=	70		

Threshold of Severe Impact - Land Use Category 3

L_E<44	Lp=	22.322+0.940LE		
44<=L_E<=77	Lp=	$101.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	76.6
L_E >77	Lp=	80		

NO BUILD - Ldn

Calculate Average Hourly Daytime Leq:

		V=	431 vehicles
Project Increment			
Project-Generated Noise Level:			
Based on Table 6-6, FTA Manual, calculated Leq at 50ft.			
Hourly Noise Level:	Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6		
Hourly Volume of Vehicles:	V		
Cemissions	Ce = 40 LOG(S/50), for autos	Ce=	-12 mph
Average Vehicle Speed:	S	S=	25 mph
		SELref=	74 dBA
Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.			
Calculate Average Hourly Project Noise Levels Leq:		Leq(h)=	53.0 dBA

Calculate Average Hourly Nighttime Leq:

		V=	321 vehicles
Project Increment			
Project-Generated Noise Level:			
Based on Table 6-6, FTA Manual, calculated Leq at 50ft.			
Hourly Noise Level:	Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6		
Hourly Volume of Vehicles:	V		
Cemissions	Ce = 40 LOG(S/50), for autos	Ce=	-12 mph
Average Vehicle Speed:	S	S=	25 mph
		SELref=	74 dBA
Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.			
Calculate Average Hourly Project Noise Levels Leq:		Leq(h)=	51.7 dBA

Calculate Day-Night Noise Level Ldn:

		Existing Ldn=	70.8 dBA
Project-Generated Noise Level:			
Based on Table 6-6, FTA Manual, calculated Leq at 50ft.			
Day and Night Noise Level:	Ldn = 10 LOG [(15) * 10^(Leq(day)/10) + (9)*10^(Leq(night)/10) - 13.8		
Daytime Noise Level:		Leq=	53.0 mph
Nighttime Noise Level:		Leq=	51.7 mph
Calculate Day-Night Ldn:		Ldn=	58.3 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 2 Ldn						
Daytime	70.8	58.3	71.0	65.0	70.1	No Impact

Threshold of Impact - Land Use Category 2

L_E<42	Lp=	$11.450+0.953L_E$		
42<=L_E<=71	Lp=	$71.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	65.0
L_E >71	Lp=	65		

Threshold of Severe Impact - Land Use Category 2

L_E<44	Lp=	$17.322+0.940L_E$		
44<=L_E<=77	Lp=	$96.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	70.1
L_E >77	Lp=	75		

Methodology: Detailed Noise Analysis based on FTA Manual
Assumed average vehicle speed 25 mph.

BUILD - Leq (AM)

Calculate Hourly Daytime Leq:

	V=	761 vehicles
Project Increment		
Measured Level	Leq(day)=	72.9 dBA
Project-Generated Noise Level:		
Based on Table 6-6, FTA Manual, calculated Leq at 50ft.		
Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6		
Hourly Volume of Vehicles: V		
Cemissions Ce = 40 LOG(S/50), for autos	Ce=	-12 mph
Average Vehicle Speed: S	S=	25 mph
	SELref=	74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Hourly Project Noise Levels Leq: Leq(h)= 55.5 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 3 Leq						
Daytime	72.9	55.5	73.0	70.0	76.6	No Impact

Threshold of Impact - Land Use Category 3

L_E<42	Lp=	$16.450+0.953L_E$		
42<=L_E<=71	Lp=	$76.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	71.6
L_E >71	Lp=	70		

Threshold of Severe Impact - Land Use Category 3

L_E<44	Lp=	22.322+0.940LE		
44<=L_E<=77	Lp=	$101.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	76.6
L_E >77	Lp=	80		

BUILD - Ldn

Calculate Average Hourly Daytime Leq:

V= 842 vehicles

Project Increment

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Average Hourly Project Noise Levels Leq: Leq(h)= 55.9 dBA

Calculate Average Hourly Nighttime Leq:

V= 422 vehicles

Project Increment

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Average Hourly Project Noise Levels Leq: Leq(h)= 52.9 dBA

Calculate Day-Night Noise Level Ldn:

Existing Ldn= 70.8 dBA

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Day and Night Noise Level: Ldn = 10 LOG [(15) * 10^(Leq(day)/10) + (9)*10^(Leq(night)/10) - 13.8

Daytime Noise Level: Leq= 55.9 mph

Nighttime Noise Level: Leq= 52.9 mph

Calculate Day-Night Ldn: Ldn= 59.9 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 2 Ldn						
Daytime	70.8	59.9	71.1	65.0	70.1	No Impact

Threshold of Impact - Land Use Category 2

$L_E<42$ Lp= $11.450+0.953L_E$

$42<=L_E<=71$ Lp= $71.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$ = 65.0

$L_E>71$ Lp= 65

Threshold of Severe Impact - Land Use Category 2

$L_E<44$ Lp= $17.322+0.940L_E$

$44<=L_E<=77$ Lp= $96.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$ = 70.1

$L_E>77$ Lp= 75

Methodology: Detailed Noise Analysis based on FTA Manual
Assumed average vehicle speed 25 mph.

NO BUILD - Leq (AM)

Calculate Hourly Daytime Leq:

	V=	1274 vehicles
Project Increment		
Measured Level	Leq(day)=	76 dBA

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Hourly Project Noise Levels Leq: Leq(h)= 57.7 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 3 Leq						
Daytime	76.0	57.7	76.1	70.0	79.0	No Impact

Threshold of Impact - Land Use Category 3

L_E<42	Lp=	$16.450+0.953L_E$		
42<=L_E<=71	Lp=	$76.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	74.2
L_E >71	Lp=	70		

Threshold of Severe Impact - Land Use Category 3

L_E<44	Lp=	22.322+0.940LE		
44<=L_E<=77	Lp=	$101.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-3}L_E^3$	=	79.0
L_E >77	Lp=	80		

Methodology: Detailed Noise Analysis based on FTA Manual
Assumed average vehicle speed 25 mph.

BUILD - Leq (AM)

Calculate Hourly Daytime Leq:

	V=	1768 vehicles
Project Increment		
Measured Level	Leq(day)=	76 dBA
Project-Generated Noise Level:		
Based on Table 6-6, FTA Manual, calculated Leq at 50ft.		
Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6		
Hourly Volume of Vehicles: V		
Cemissions Ce = 40 LOG(S/50), for autos	Ce=	-12 mph
Average Vehicle Speed: S	S=	25 mph
	SELref=	74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Hourly Project Noise Levels Leq: Leq(h)= 59.1 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 3 Leq						
Daytime	76.0	59.1	76.1	70.0	79.0	No Impact

Threshold of Impact - Land Use Category 3

L_E<42	Lp=	$16.450+0.953L_E$		
42<=L_E<=71	Lp=	$76.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	74.2
L_E >71	Lp=	70		

Threshold of Severe Impact - Land Use Category 3

L_E<44	Lp=	22.322+0.940LE		
44<=L_E<=77	Lp=	$101.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-3}L_E^3$	=	79.0
L_E >77	Lp=	80		

Methodology: Detailed Noise Analysis based on FTA Manual
Assumed average vehicle speed 25 mph.

NO BUILD - Leq (AM)

Calculate Hourly Daytime Leq:

	V=	657 vehicles
Project Increment		
Measured Level	Leq(day)=	75.2 dBA

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Hourly Project Noise Levels Leq: Leq(h)= 54.8 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 3 Leq						
Daytime	75.2	54.8	75.2	70.0	78.4	No Impact

Threshold of Impact - Land Use Category 3

L_E<42	Lp=	$16.450+0.953L_E$		
42<=L_E<=71	Lp=	$76.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	73.5
L_E >71	Lp=	70		

Threshold of Severe Impact - Land Use Category 3

L_E<44	Lp=	22.322+0.940LE		
44<=L_E<=77	Lp=	$101.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	78.4
L_E >77	Lp=	80		

Methodology: Detailed Noise Analysis based on FTA Manual
Assumed average vehicle speed 25 mph.

BUILD - Leq (AM)

Calculate Hourly Daytime Leq:

	V=	1185 vehicles
Project Increment		
Measured Level	Leq(day)=	75.2 dBA
Project-Generated Noise Level:		
Based on Table 6-6, FTA Manual, calculated Leq at 50ft.		
Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6		
Hourly Volume of Vehicles: V		
Cemissions Ce = 40 LOG(S/50), for autos	Ce=	-12 mph
Average Vehicle Speed: S	S=	25 mph
	SELref=	74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Hourly Project Noise Levels Leq: Leq(h)= 57.4 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 3 Leq						
Daytime	75.2	57.4	75.3	70.0	78.4	No Impact

Threshold of Impact - Land Use Category 3

$L_E<42$	Lp=	$16.450+0.953L_E$		
$42<=L_E<=71$	Lp=	$76.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	73.5
$L_E>71$	Lp=	70		

Threshold of Severe Impact - Land Use Category 3

$L_E<44$	Lp=	22.322+0.940LE		
$44<=L_E<=77$	Lp=	$101.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	78.4
$L_E>77$	Lp=	80		

Methodology: Detailed Noise Analysis based on FTA Manual
Assumed average vehicle speed 25 mph.

NO BUILD - Leq (AM)

Calculate Hourly Daytime Leq:

	V=	528 vehicles
Project Increment		
Measured Level	Leq(day)=	68.8 dBA

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Hourly Project Noise Levels Leq: Leq(h)= 53.9 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 3 Leq						
Daytime	68.8	53.9	68.9	68.5	73.7	No Impact

Threshold of Impact - Land Use Category 3

$L_E<42$	Lp=	$16.450+0.953L_E$		
$42<=L_E<=71$	Lp=	$76.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	68.5
$L_E>71$	Lp=	70		

Threshold of Severe Impact - Land Use Category 3

$L_E<44$	Lp=	22.322+0.940LE		
$44<=L_E<=77$	Lp=	$101.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	73.7
$L_E>77$	Lp=	80		

NO BUILD - Ldn

Calculate Average Hourly Daytime Leq:

	V=	475 vehicles

Project Increment

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Average Hourly Project Noise Levels Leq: Leq(h)= 53.4 dBA

Calculate Average Hourly Nighttime Leq:

	V=	161 vehicles

Project Increment

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Average Hourly Project Noise Levels Leq: Leq(h)= 48.7 dBA

Calculate Day-Night Noise Level Ldn:

Existing Ldn= 69.9 dBA

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Day and Night Noise Level: Ldn = 10 LOG [(15) * 10^(Leq(day)/10) + (9)*10^(Leq(night)/10) - 13.8

Daytime Noise Level: Leq= 53.4 mph

Nighttime Noise Level: Leq= 48.7 mph

Calculate Day-Night Ldn: Ldn= 56.2 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 2 Ldn						
Daytime	69.9	56.2	70.1	64.3	69.4	No Impact

Threshold of Impact - Land Use Category 2

$L_E<42$	Lp=	$11.450+0.953L_E$		
$42<=L_E<=71$	Lp=	$71.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	64.3
$L_E>71$	Lp=	65		

Threshold of Severe Impact - Land Use Category 2

$L_E<44$	Lp=	$17.322+0.940L_E$		
$44<=L_E<=77$	Lp=	$96.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	69.4
$L_E>77$	Lp=	75		

Methodology: Detailed Noise Analysis based on FTA Manual
Assumed average vehicle speed 25 mph.

BUILD - Leq (AM)

Calculate Hourly Daytime Leq:

	V=	761 vehicles
Project Increment		
Measured Level	Leq(day)=	68.8 dBA

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Hourly Project Noise Levels Leq: Leq(h)= 55.5 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 3 Leq						
Daytime	68.8	55.5	69.0	68.5	73.7	No Impact

Threshold of Impact - Land Use Category 3

L_E<42	Lp=	$16.450+0.953L_E$		
42<=L_E<=71	Lp=	$76.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	68.5
L_E >71	Lp=	70		

Threshold of Severe Impact - Land Use Category 3

L_E<44	Lp=	22.322+0.940LE		
44<=L_E<=77	Lp=	$101.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	73.7
L_E >77	Lp=	80		

BUILD - Ldn

Calculate Average Hourly Daytime Leq:

	V=	695 vehicles

Project Increment

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Average Hourly Project Noise Levels Leq: Leq(h)= 55.1 dBA

Calculate Average Hourly Nighttime Leq:

	V=	212 vehicles

Project Increment

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Average Hourly Project Noise Levels Leq: Leq(h)= 49.9 dBA

Calculate Day-Night Noise Level Ldn:

Existing Ldn= 69.9 dBA

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Day and Night Noise Level: Ldn = 10 LOG [(15) * 10^(Leq(day)/10) + (9)*10^(Leq(night)/10) - 13.8

Daytime Noise Level: Leq= 55.1 mph

Nighttime Noise Level: Leq= 49.9 mph

Calculate Day-Night Ldn: Ldn= 57.6 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 2 Ldn						
Daytime	69.9	57.6	70.1	64.3	69.4	No Impact

Threshold of Impact - Land Use Category 2

$L_E<42$	Lp=	$11.450+0.953L_E$		
$42<=L_E<=71$	Lp=	$71.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	64.3
$L_E>71$	Lp=	65		

Threshold of Severe Impact - Land Use Category 2

$L_E<44$	Lp=	$17.322+0.940L_E$		
$44<=L_E<=77$	Lp=	$96.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	69.4
$L_E>77$	Lp=	75		

Methodology: Detailed Noise Analysis based on FTA Manual
Assumed average vehicle speed 25 mph.

NO BUILD - Leq (AM)

Calculate Hourly Daytime Leq:

	V=	82 vehicles
Project Increment		
Measured Level	Leq(day)=	76.1 dBA

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Hourly Project Noise Levels Leq: Leq(h)= 45.8 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 3 Leq						
Daytime	76.1	45.8	76.1	70.0	79.1	No Impact

Threshold of Impact - Land Use Category 3

L_E<42	Lp=	$16.450+0.953L_E$		
42<=L_E<=71	Lp=	$76.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	74.3
L_E >71	Lp=	70		

Threshold of Severe Impact - Land Use Category 3

L_E<44	Lp=	22.322+0.940LE		
44<=L_E<=77	Lp=	$101.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	79.1
L_E >77	Lp=	80		

Methodology: Detailed Noise Analysis based on FTA Manual
Assumed average vehicle speed 25 mph.

BUILD - Leq (AM)

Calculate Hourly Daytime Leq:

	V=	254 vehicles
Project Increment		
Measured Level	Leq(day)=	76.1 dBA
Project-Generated Noise Level:		
Based on Table 6-6, FTA Manual, calculated Leq at 50ft.		
Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6		
Hourly Volume of Vehicles: V		
Cemissions Ce = 40 LOG(S/50), for autos	Ce=	-12 mph
Average Vehicle Speed: S	S=	25 mph
	SELref=	74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Hourly Project Noise Levels Leq: Leq(h)= 50.7 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 3 Leq						
Daytime	76.1	50.7	76.1	70.0	79.1	No Impact

Threshold of Impact - Land Use Category 3

$L_E<42$	Lp=	$16.450+0.953L_E$		
$42<=L_E<=71$	Lp=	$76.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	74.3
$L_E>71$	Lp=	70		

Threshold of Severe Impact - Land Use Category 3

$L_E<44$	Lp=	22.322+0.940LE		
$44<=L_E<=77$	Lp=	$101.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	79.1
$L_E>77$	Lp=	80		

Methodology: Detailed Noise Analysis based on FTA Manual
Assumed average vehicle speed 25 mph.

NO BUILD - Leq (AM)

Calculate Hourly Daytime Leq:

	V=	848 vehicles
Project Increment		
Measured Level	Leq(day)=	71.4 dBA

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Hourly Project Noise Levels Leq: Leq(h)= 55.9 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 3 Leq						
Daytime	71.4	55.9	71.5	70.0	75.5	No Impact

Threshold of Impact - Land Use Category 3

L_E<42	Lp=	$16.450+0.953L_E$		
42<=L_E<=71	Lp=	$76.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-3}L_E^3$	=	70.4
L_E >71	Lp=	70		

Threshold of Severe Impact - Land Use Category 3

L_E<44	Lp=	22.322+0.940LE		
44<=L_E<=77	Lp=	$101.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	75.5
L_E >77	Lp=	80		

NO BUILD - Ldn

Calculate Average Hourly Daytime Leq:

	V=	681 vehicles

Project Increment

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Average Hourly Project Noise Levels Leq: Leq(h)= 55.0 dBA

Calculate Average Hourly Nighttime Leq:

	V=	195 vehicles

Project Increment

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Average Hourly Project Noise Levels Leq: Leq(h)= 49.6 dBA

Calculate Day-Night Noise Level Ldn:

Existing Ldn= 68.5 dBA

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Day and Night Noise Level: Ldn = 10 LOG [(15) * 10^(Leq(day)/10) + (9)*10^(Leq(night)/10) - 13.8

Daytime Noise Level: Leq= 55.0 mph

Nighttime Noise Level: Leq= 49.6 mph

Calculate Day-Night Ldn: Ldn= 57.3 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 2 Ldn						
Daytime	68.5	57.3	68.8	63.2	68.5	No Impact

Threshold of Impact - Land Use Category 2

$L_E<42$	Lp=	$11.450+0.953L_E$		
$42<=L_E<=71$	Lp=	$71.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	63.2
$L_E>71$	Lp=	65		

Threshold of Severe Impact - Land Use Category 2

$L_E<44$	Lp=	$17.322+0.940L_E$		
$44<=L_E<=77$	Lp=	$96.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	68.5
$L_E>77$	Lp=	75		

Methodology: Detailed Noise Analysis based on FTA Manual
Assumed average vehicle speed 25 mph.

BUILD - Leq (AM)

Calculate Hourly Daytime Leq:

	V=	1304 vehicles
Project Increment		
Measured Level	Leq(day)=	71.4 dBA

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Hourly Project Noise Levels Leq: Leq(h)= 57.8 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 3 Leq						
Daytime	71.4	57.8	71.6	70.0	75.5	No Impact

Threshold of Impact - Land Use Category 3

$L_E<42$	Lp=	$16.450+0.953L_E$		
$42<=L_E<=71$	Lp=	$76.662 - 1.164L_E + 0.018L_E^4 - 4.088x10^{-6}L_E^5$	=	70.4
$L_E>71$	Lp=	70		

Threshold of Severe Impact - Land Use Category 3

$L_E<44$	Lp=	22.322+0.940LE		
$44<=L_E<=77$	Lp=	$101.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	75.5
$L_E>77$	Lp=	80		

BUILD - Ldn

Calculate Average Hourly Daytime Leq:

Project Increment		V=	1075 vehicles

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level:	Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6		
Hourly Volume of Vehicles:	V		
Cemissions	Ce = 40 LOG(S/50), for autos	Ce=	-12 mph
Average Vehicle Speed:	S	S=	25 mph
		SELref=	74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Average Hourly Project Noise Levels Leq:	Leq(h)=	57.0 dBA

Calculate Average Hourly Nighttime Leq:

Project Increment		V=	286 vehicles

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level:	Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6		
Hourly Volume of Vehicles:	V		
Cemissions	Ce = 40 LOG(S/50), for autos	Ce=	-12 mph
Average Vehicle Speed:	S	S=	25 mph
		SELref=	74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Average Hourly Project Noise Levels Leq:	Leq(h)=	51.2 dBA

Calculate Day-Night Noise Level Ldn:

	Existing Ldn=	68.5 dBA

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Day and Night Noise Level:	Ldn = 10 LOG [(15) * 10^(Leq(day)/10) + (9)*10^(Leq(night)/10) - 13.8		
Daytime Noise Level:		Leq=	57.0 mph
Nighttime Noise Level:		Leq=	51.2 mph
Calculate Day-Night Ldn:		Ldn=	59.1 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 2 Ldn						
Daytime	68.5	59.1	69.0	63.2	68.5	No Impact

Threshold of Impact - Land Use Category 2

L_E<42	Lp=	$11.450+0.953L_E$		
42<=L_E<=71	Lp=	$71.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	63.2
L_E >71	Lp=	65		

Threshold of Severe Impact - Land Use Category 2

L_E<44	Lp=	$17.322+0.940L_E$		
44<=L_E<=77	Lp=	$96.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	68.5
L_E >77	Lp=	75		

Methodology: Detailed Noise Analysis based on FTA Manual
Assumed average vehicle speed 25 mph.

NO BUILD - Leq (AM)

Calculate Hourly Daytime Leq:

	V=	1261 vehicles
Project Increment		
Measured Level	Leq(day)=	71.7 dBA

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Hourly Project Noise Levels Leq: Leq(h)= 57.7 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 3 Leq						
Daytime	71.7	57.7	71.9	70.0	75.7	No Impact

Threshold of Impact - Land Use Category 3

$L_E<42$	Lp=	$16.450+0.953L_E$		
$42<=L_E<=71$	Lp=	$76.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	70.7
$L_E>71$	Lp=	70		

Threshold of Severe Impact - Land Use Category 3

$L_E<44$	Lp=	22.322+0.940LE		
$44<=L_E<=77$	Lp=	$101.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	75.7
$L_E>77$	Lp=	80		

Methodology: Detailed Noise Analysis based on FTA Manual
Assumed average vehicle speed 25 mph.

BUILD - Leq (AM)

Calculate Hourly Daytime Leq:

	V=	1424 vehicles
Project Increment		
Measured Level	Leq(day)=	71.7 dBA

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Hourly Project Noise Levels Leq: Leq(h)= 58.2 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 3 Leq						
Daytime	71.7	58.2	71.9	70.0	75.7	No Impact

Threshold of Impact - Land Use Category 3

$L_E<42$	Lp=	$16.450+0.953L_E$		
$42<=L_E<=71$	Lp=	$76.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	70.7
$L_E>71$	Lp=	70		

Threshold of Severe Impact - Land Use Category 3

$L_E<44$	Lp=	22.322+0.940LE		
$44<=L_E<=77$	Lp=	$101.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	75.7
$L_E>77$	Lp=	80		

Methodology: Detailed Noise Analysis based on FTA Manual
Assumed average vehicle speed 25 mph.

NO BUILD - Leq (AM)

Calculate Hourly Daytime Leq:

	V=	142 vehicles
Project Increment		
Measured Level	Leq(day)=	66.9 dBA

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Hourly Project Noise Levels Leq: Leq(h)= 48.2 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 3 Leq						
Daytime	66.9	48.2	67.0	67.1	72.4	No Impact

Threshold of Impact - Land Use Category 3

$L_E<42$	Lp=	$16.450+0.953L_E$		
$42<=L_E<=71$	Lp=	$76.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	67.1
$L_E>71$	Lp=	70		

Threshold of Severe Impact - Land Use Category 3

$L_E<44$	Lp=	22.322+0.940LE		
$44<=L_E<=77$	Lp=	$101.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	72.4
$L_E>77$	Lp=	80		

Methodology: Detailed Noise Analysis based on FTA Manual
Assumed average vehicle speed 25 mph.

BUILD - Leq (AM)

Calculate Hourly Daytime Leq:

	V=	560 vehicles
Project Increment		
Measured Level	Leq(day)=	66.9 dBA

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Hourly Project Noise Levels Leq: Leq(h)= 54.1 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 3 Leq						
Daytime	66.9	54.1	67.1	67.1	72.4	No Impact

Threshold of Impact - Land Use Category 3

$L_E<42$	Lp=	$16.450+0.953L_E$		
$42<=L_E<=71$	Lp=	$76.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	67.1
$L_E>71$	Lp=	70		

Threshold of Severe Impact - Land Use Category 3

$L_E<44$	Lp=	22.322+0.940LE		
$44<=L_E<=77$	Lp=	$101.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	72.4
$L_E>77$	Lp=	80		

Methodology: Detailed Noise Analysis based on FTA Manual
Assumed average vehicle speed 25 mph.

NO BUILD - Leq (AM)

Calculate Hourly Daytime Leq:

	V=	1447 vehicles
Project Increment		
Measured Level	Leq(day)=	71.2 dBA

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Hourly Project Noise Levels Leq: Leq(h)= 58.3 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 3 Leq						
Daytime	71.2	58.3	71.4	70.0	75.3	No Impact

Threshold of Impact - Land Use Category 3

$L_E<42$	Lp=	$16.450+0.953L_E$		
$42<=L_E<=71$	Lp=	$76.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	70.3
$L_E>71$	Lp=	70		

Threshold of Severe Impact - Land Use Category 3

$L_E<44$	Lp=	22.322+0.940LE		
$44<=L_E<=77$	Lp=	$101.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	75.3
$L_E>77$	Lp=	80		

NO BUILD - Ldn

Calculate Average Hourly Daytime Leq:

		V=	1012 vehicles
Project Increment			

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Average Hourly Project Noise Levels Leq: Leq(h)= 56.7 dBA

Calculate Average Hourly Nighttime Leq:

		V=	528 vehicles
Project Increment			

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Average Hourly Project Noise Levels Leq: Leq(h)= 53.9 dBA

Calculate Day-Night Noise Level Ldn:

Existing Ldn= 77.6 dBA

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Day and Night Noise Level: Ldn = 10 LOG [(15) * 10^(Leq(day)/10) + (9)*10^(Leq(night)/10) - 13.8

Daytime Noise Level: Leq= 56.7 mph

Nighttime Noise Level: Leq= 53.9 mph

Calculate Day-Night Ldn: Ldn= 60.8 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 2 Ldn						
Daytime	77.6	60.8	77.7	65.0	75.0	No Impact

Threshold of Impact - Land Use Category 2

L_E<42	Lp=	$11.450+0.953L_E$		
42<=L_E<=71	Lp=	$71.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	70.6
L_E >71	Lp=	65		

Threshold of Severe Impact - Land Use Category 2

L_E<44	Lp=	$17.322+0.940L_E$		
44<=L_E<=77	Lp=	$96.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	75.3
L_E >77	Lp=	75		

Methodology: Detailed Noise Analysis based on FTA Manual
Assumed average vehicle speed 25 mph.

BUILD - Leq (AM)

Calculate Hourly Daytime Leq:

	V=	1447 vehicles
Project Increment		
Measured Level	Leq(day)=	71.2 dBA
Project-Generated Noise Level:		
Based on Table 6-6, FTA Manual, calculated Leq at 50ft.		
Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6		
Hourly Volume of Vehicles: V		
Cemissions Ce = 40 LOG(S/50), for autos	Ce=	-12 mph
Average Vehicle Speed: S	S=	25 mph
	SELref=	74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Hourly Project Noise Levels Leq: Leq(h)= 58.3 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 3 Leq						
Daytime	71.2	58.3	71.4	70.0	75.3	No Impact

Threshold of Impact - Land Use Category 3

$L_E<42$	Lp=	$16.450+0.953L_E$		
$42<=L_E<=71$	Lp=	$76.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	70.3
$L_E>71$	Lp=	70		

Threshold of Severe Impact - Land Use Category 3

$L_E<44$	Lp=	22.322+0.940LE		
$44<=L_E<=77$	Lp=	$101.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	75.3
$L_E>77$	Lp=	80		

BUILD - Ldn

Calculate Average Hourly Daytime Leq:

	V=	1012 vehicles

Project Increment

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Average Hourly Project Noise Levels Leq: Leq(h)= 56.7 dBA

Calculate Average Hourly Nighttime Leq:

	V=	619 vehicles

Project Increment

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Average Hourly Project Noise Levels Leq: Leq(h)= 54.6 dBA

Calculate Day-Night Noise Level Ldn:

Existing Ldn= 77.6 dBA

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Day and Night Noise Level: Ldn = 10 LOG [(15) * 10^(Leq(day)/10) + (9)*10^(Leq(night)/10) - 13.8

Daytime Noise Level: Leq= 56.7 mph

Nighttime Noise Level: Leq= 54.6 mph

Calculate Day-Night Ldn: Ldn= 61.4 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 2 Ldn						
Daytime	77.6	61.4	77.7	65.0	75.0	No Impact

Threshold of Impact - Land Use Category 2

$L_E<42$	Lp=	$11.450+0.953L_E$		
$42<=L_E<=71$	Lp=	$71.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	70.6
$L_E>71$	Lp=	65		

Threshold of Severe Impact - Land Use Category 2

$L_E<44$	Lp=	$17.322+0.940L_E$		
$44<=L_E<=77$	Lp=	$96.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	75.3
$L_E>77$	Lp=	75		

Methodology: Detailed Noise Analysis based on FTA Manual
Assumed average vehicle speed 25 mph.

NO BUILD - Leq (AM)

Calculate Hourly Daytime Leq:

	V=	666 vehicles
Project Increment		
Measured Level	Leq(day)=	68.4 dBA

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Hourly Project Noise Levels Leq: Leq(h)= 54.9 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 3 Leq						
Daytime	68.4	54.9	68.6	68.2	73.4	No Impact

Threshold of Impact - Land Use Category 3

L_E<42	Lp=	$16.450+0.953L_E$		
42<=L_E<=71	Lp=	$76.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	68.2
L_E >71	Lp=	70		

Threshold of Severe Impact - Land Use Category 3

L_E<44	Lp=	22.322+0.940LE		
44<=L_E<=77	Lp=	$101.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	73.4
L_E >77	Lp=	80		

Methodology: Detailed Noise Analysis based on FTA Manual
Assumed average vehicle speed 25 mph.

BUILD - Leq (AM)

Calculate Hourly Daytime Leq:

	V=	745 vehicles
Project Increment		
Measured Level	Leq(day)=	68.4 dBA

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Hourly Project Noise Levels Leq: Leq(h)= 55.4 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 3 Leq						
Daytime	68.4	55.4	68.6	68.2	73.4	No Impact

Threshold of Impact - Land Use Category 3

L_E<42	Lp=	$16.450+0.953L_E$		
42<=L_E<=71	Lp=	$76.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	68.2
L_E >71	Lp=	70		

Threshold of Severe Impact - Land Use Category 3

L_E<44	Lp=	22.322+0.940LE		
44<=L_E<=77	Lp=	$101.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	73.4
L_E >77	Lp=	80		

Methodology: Detailed Noise Analysis based on FTA Manual
Assumed average vehicle speed 25 mph.

NO BUILD - Leq (AM)

Calculate Hourly Daytime Leq:

	V=	637 vehicles
Project Increment		
Measured Level	Leq(day)=	72.5 dBA

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Hourly Project Noise Levels Leq: Leq(h)= 54.7 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 3 Leq						
Daytime	72.5	54.7	72.6	70.0	76.3	No Impact

Threshold of Impact - Land Use Category 3

L_E<42	Lp=	$16.450+0.953L_E$		
42<=L_E<=71	Lp=	$76.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	71.3
L_E >71	Lp=	70		

Threshold of Severe Impact - Land Use Category 3

L_E<44	Lp=	22.322+0.940LE		
44<=L_E<=77	Lp=	$101.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	76.3
L_E >77	Lp=	80		

Methodology: Detailed Noise Analysis based on FTA Manual
Assumed average vehicle speed 25 mph.

BUILD - Leq (AM)

Calculate Hourly Daytime Leq:

	V=	799 vehicles
Project Increment		
Measured Level	Leq(day)=	72.5 dBA

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Hourly Project Noise Levels Leq: Leq(h)= 55.7 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 3 Leq						
Daytime	72.5	55.7	72.6	70.0	76.3	No Impact

Threshold of Impact - Land Use Category 3

L_E<42	Lp=	$16.450+0.953L_E$		
42<=L_E<=71	Lp=	$76.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	71.3
L_E >71	Lp=	70		

Threshold of Severe Impact - Land Use Category 3

L_E<44	Lp=	22.322+0.940LE		
44<=L_E<=77	Lp=	$101.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	76.3
L_E >77	Lp=	80		

Methodology: Detailed Noise Analysis based on FTA Manual
Assumed average vehicle speed 25 mph.

NO BUILD - Leq (AM)

Calculate Hourly Daytime Leq:

	V=	1208 vehicles
Project Increment		
Measured Level	Leq(day)=	75.1 dBA

Project-Generated Noise Level:

Based on Table 6-6, FTA Manual, calculated Leq at 50ft.

Hourly Noise Level: Leq = SELref 10 LOG(V) + Cemissions - LOG (S/50) - 35.6

Hourly Volume of Vehicles: V

Cemissions Ce = 40 LOG(S/50), for autos — Ce= -12 mph

Average Vehicle Speed: S — S= 25 mph

SELref= 74 dBA

Based on Table 6-5, FTA Manual, SELref = 74 dBA at 50ft for automobiles.

Calculate Hourly Project Noise Levels Leq: Leq(h)= 57.5 dBA

Based on Appendix B-5, FTA Manual, calculate Impact Criteria:

	Existing	Project	Build	Impact	Severe Impact	
Category 3 Leq						
Daytime	75.1	57.5	75.2	70.0	78.3	No Impact

Threshold of Impact - Land Use Category 3

L_E<42	Lp=	$16.450+0.953L_E$		
42<=L_E<=71	Lp=	$76.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	73.5
L_E >71	Lp=	70		

Threshold of Severe Impact - Land Use Category 3

L_E<44	Lp=	22.322+0.940LE		
44<=L_E<=77	Lp=	$101.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	78.3
L_E >77	Lp=	80		