

## **Appendix 5.7-1 Noise Modeling Calculations**

## Appendices

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<b>OVSD-01: Pleasant View</b>		<b>: Construction Noise Calculations</b>		
<b>Receptor</b>	<b>Spatially AVG Distance(ft)</b>	<b>Worst-case Distance (ft)</b>	<b>Land Use Type</b>	
1 Residences to South	290	90	Residential	
2 Residences to West	525	400	Residential	
3 Residences to North	515	270	Residential	
4 Juanita Blakely Jones ES	600	95	Residential	
5 Sturgis Auditorium	330	45	Residential	

TYPE PHASE NAME >>>				BldgDemo+Proc (per 8 hour day)		BldgDemo+Proc& (per 8 hour day)		BldgDemo+Proc& (per 8 hour day)		BldgDemo+Proc,S (per 8 hour day)		Utility Trenching (per 8 hour day)		Fine Grading (per 8 hour day)		Building Construc (per 8 hour day)		Bldg Const& Coati (per 8 hour day)		Bldg Const&Finish		BldgConst,Finish,&Pave		
Equipment Item (dropdown Menu)	Leq @ 50 ft	Leq Energy @ 50	Lmax @ 50 ft	Lmax Energy	Quantity	Hours of Usage	Quantity	Hours of Usage	Quantity	Hours of Usage	Quantity	Hours of Usage	Quantity	Hours of Usage	Quantity	Hours of Usage	Quantity	Hours of Usage	Quantity	Hours of Usage	Quantity	Hours of Usage	Quantity	Hours of Usage
(RCNM) Excavator	76.7	46773514.13	80.7	117489755.5	2	8	2	8	3	8	3	8	1	8		8		8	1	8	1	8	1	8
(RCNM) Front End Loader	75.1	32359365.69	79.1	81283051.62	3	8	3	8	4	8	5	8	1	8		8		8	1	8	1	8	1	8
(RCNM) Tractor	80	100000000	84	251188643.2	2	8	3	8	2	8	2	8		8	3	7		8	3	7	3	7	3	7
(RCNM) Scraper	79.6	91201083.94	83.6	229086765.3		8		8		8	2	8		8		8		8		8		8		8
(RCNM) Grader	81	125892541.2	85	316227766		8		8		8		8		8	1	8		8		8		8		8
(RCNM) Compressor (air)	73.7	23442288.15	77.7	58884365.54		8		8		8		8		8		8	1	6		8	1	6	1	6
(RCNM) Paver	74.2	26302679.92	77.2	52480746.02		8		8		8		8		8		8		8		8		8		8
(RCNM) Roller	73	19952623.15	80	100000000		8		8		8		8		8		8		8		8		8		8
(FTA) Generator	81	125892541.2	84	251188643.2		8		8		8		8		8		8	1	8		8	1	8	1	8
(RCNM) Welder/Torch	70	10000000	74	25118864.32		8		8		8		8		8		8	1	8		8	1	8	1	8
(RCNM) Crane	72.6	18197008.59	80.6	114815362.1		8		8		8		8		8		8	1	7		8	1	7	1	7
(RCNM) Man Lift	67.7	5888436.554	74.7	29512092.27		8		8		8		8	3	8		8	3	8		8	3	8	3	8
(RCNM) Pavement Scarafier	82.5	177827941	89.5	891250938.1		8	1	8		8		8		8		8		8		8		8		8
None	0	1	0	1		8		8		8		8		8		8		8		8		8		8
None	0	1	0	1		8		8		8		8		8		8		8		8		8		8
<b>PLACWORKS</b>				<b>Totals at 50 feet</b>	<b>BldgDemo+Proc</b>		<b>BldgDemo+Proc&amp;ADemo_P</b>		<b>BldgDemo+Proc&amp;Site Prep</b>		<b>BldgDemo+Proc,Site Prep,&amp;</b>		<b>Utility Trenching</b>		<b>Fine Grading</b>		<b>Building Construction</b>		<b>Bldg Const&amp; Coating</b>		<b>Bldg Const&amp;Finish</b>		<b>BldgConst,Finish,&amp;Pav</b>	
					Total Leq	Lmax	Total Leq	Lmax	Total Leq	Lmax	Total Leq	Lmax	Total Leq	Lmax	Total Leq	Lmax	Total Leq	Lmax	Total Leq	Lmax	Total Leq	Lmax	Total Leq	Lmax
					85.9	89.9	88.3	93.3	86.7	90.7	88.4	92.4	79.9	84.6	82.0	86.0	86.4	90.5	86.5	90.7	87.2	91.4	87.7	92.1

Red cell indicates level exceeds criteria

Total Leq/Lmax (dBA)

Sensitive Receptor	Attenuation (-) dB	BldgDemo+Proc&ADe		BldgDemo+Proc&Site		BldgDemo+Proc,Site															
		BldgDemo+Proc		mo_Proc		Prep		Prep,&Rgrade		Utility Trenching		Fine Grading		Building Construction		Bldg Const& Coating		Bldg Const&Finish		BldgConst,Finish,&Pave	
		Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
1 Residences to South		70.6	84.8	73.0	88.2	71.5	85.6	73.1	87.2	64.6	79.5	66.7	80.9	71.1	85.4	71.3	85.6	72.0	86.3	72.5	87.0
2 Residences to West		65.5	71.9	67.8	75.2	66.3	72.7	67.9	74.3	59.4	66.5	61.6	67.9	65.9	72.4	66.1	72.6	66.8	73.3	67.3	74.0
3 Residences to North		65.7	75.3	68.0	78.6	66.5	76.1	68.1	77.7	59.6	69.9	61.7	71.3	66.1	75.9	66.3	76.0	67.0	76.7	67.5	77.4
4 Juanita Blakely Jones ES		64.3	84.3	66.7	87.7	65.1	85.1	66.8	86.8	58.3	79.0	60.4	80.4	64.8	84.9	64.9	85.1	65.6	85.8	66.2	86.5
5 Sturgis Auditorium		69.5	90.8	71.9	94.2	70.3	91.6	72.0	93.3	63.5	85.5	65.6	86.9	70.0	91.4	70.1	91.6	70.8	92.3	71.4	93.0

### Construction Schedule

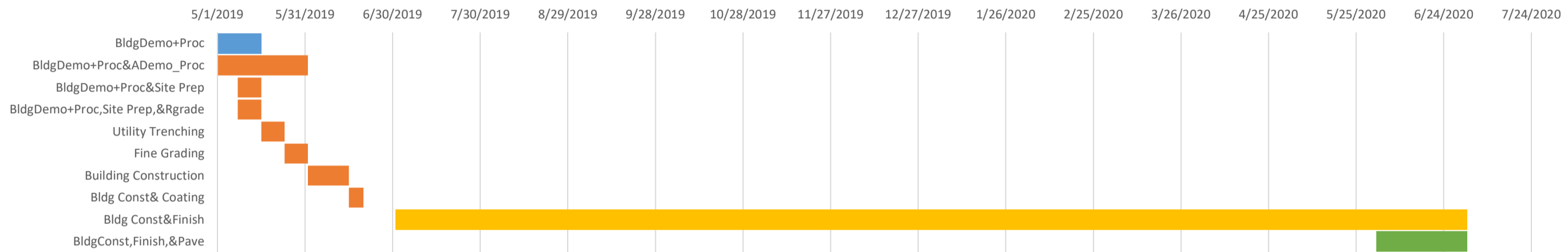
Construction Phase	Leq @ 50 ft	Start Date	End Date	Total Days
BldgDemo+Proc	85.9	5/1/2019	5/15/2019	15
BldgDemo+Proc&ADe	88.3	5/1/2019	5/31/2019	31
BldgDemo+Proc&Site	86.7	5/8/2019	5/15/2019	8
BldgDemo+Proc,Site P	88.4	5/8/2019	5/15/2019	8
Utility Trenching	79.9	5/16/2019	5/23/2019	8
Fine Grading	82.0	5/24/2019	5/31/2019	8
Building Construction	86.4	6/1/2019	6/14/2019	14
Bldg Const& Coating	86.5	6/15/2019	6/19/2019	5
Bldg Const&Finish	87.2	7/1/2019	7/1/2020	367
BldgConst,Finish,&Pav	87.7	6/1/2020	7/1/2020	31
MIN/MAX		5/1/2019	7/1/2020	
<b>Total</b>				<b>428</b>

**Receptor shown in graph**  
Residences to West

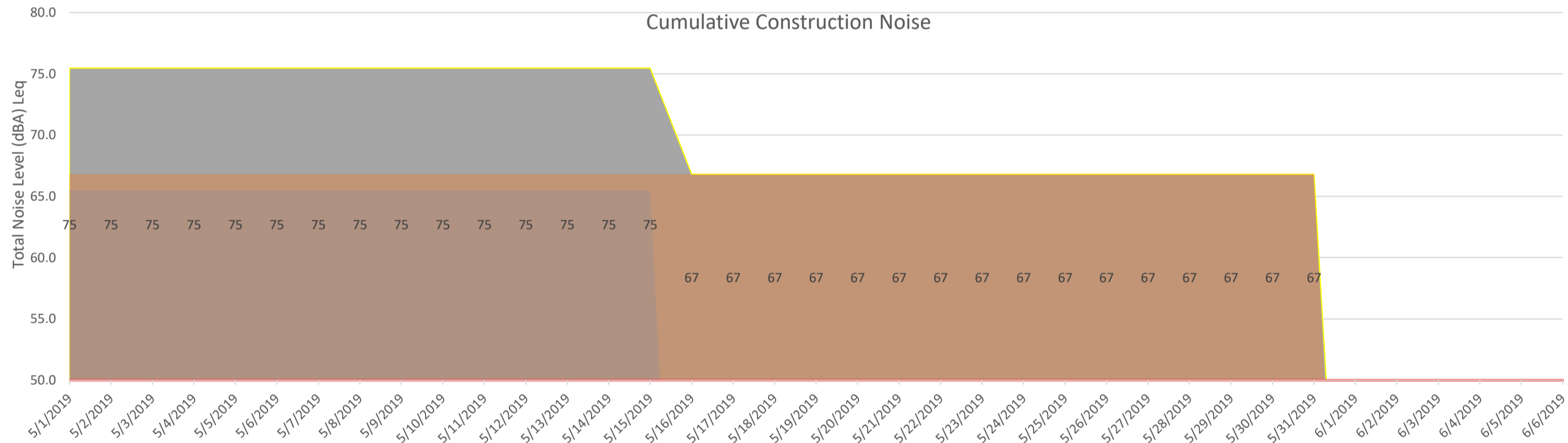
**Threshold (dBA) Leq**  
0

**Average noise level over entire construction period (dBA) Leq**  
67.4

**Max noise level over construction period**  
75.5



Cumulative Construction Noise



**Construction Vibration Worksheet**

		AVG Distance (feet)		290	525	515	600	330
<b>Vibration Annoyance</b>		Distance to (feet)						
Equipment Item	VdB (re. 1 μ-in/sec) at 25 ft	78 VdB	84 VdB	Residences to South	Residences to West	Residences to North	Juanita Blakely Jones ES	Sturgis Auditorium
Vibratory Roller	94	85.4	53.9	62.1	54.3	54.6	52.6	60.4
Large Bulldozer	87	49.9	31.5	55.1	47.3	47.6	45.6	53.4
Loaded Trucks	86	46.2	29.1	54.1	46.3	46.6	44.6	52.4
Small Bulldozer	58	5.4	3.4	26.1	18.3	18.6	16.6	24.4

Annoyance Criteria	78	78	78	78	78
Exceeds Criteria?	No	No	No	No	No

		Nearest Distance (feet)		90	400	270	95	45
<b>Vibration Damage</b>		Distance to (feet)						
Equipment Item	PPV (in/sec) at 25 ft	0.2 PPV	0.3 PPV	Residences to South	Residences to West	Residences to North	Juanita Blakely Jones ES	Sturgis Auditorium
Vibratory Roller	0.21	25.8	19.7	0.031	0.003	0.006	0.028	0.087
Large Bulldozer	0.089	14.6	11.1	0.013	0.001	0.003	0.012	0.037
Loaded Trucks	0.076	13.1	10.0	0.011	0.001	0.002	0.010	0.031
Small Bulldozer	0.003	1.5	1.2	0.0004	0.000	0.000	0.000	0.001

Vibration Damage Criteria	0.2	0.2	0.2	0.3	0.3
Exceeds Criteria?	No	No	No	No	No

## Operation-Related Traffic Noise Worksheet\*

Roadway Segment	Existing (PM Peak Trips)	Existing+Project (PM Peak Trips)	Change in Noise Level (dBA)	Percent Change in Noise Level
<b>E Street</b>				
North of 9th Street	517	526	0.07	1.7%
Between 9th Street and 8th Street	462	476	0.13	3.0%
Between 8th Street and 6th Street	467	486	0.17	4.1%
Between 6th Street and 5th Street	497	509	0.10	2.4%
South of 5th Street	540	552	0.10	2.2%
<b>F Street</b>				
North of 9th Street	182	191	0.21	4.9%
Between 9th Street and 8th Street	178	189	0.26	6.2%
Between 8th Street and 6th Street	221	233	0.23	5.4%
Between 6th Street and 5th Street	240	252	0.21	5.0%
South of 5th Street	232	246	0.25	6.0%
9th Street				
West of F Street	893	897	0.02	0.4%
Between F Street and E Street	889	889	0.00	0.0%
East of E Street	933	938	0.02	0.5%
<b>8th Street</b>				
West of F Street	88	92	0.19	4.5%
Between F Street and E Street	79	86	0.37	8.9%
East of E Street	933	938	0.02	0.5%
<b>6th Street</b>				
West of F Street	354	354	0.00	0.0%
Between F Street and E Street	327	327	0.00	0.0%
East of E Street	319	326	0.09	2.2%
<b>5th Street</b>				
West of F Street	1,848	1,855	0.02	0.4%
Between F Street and E Street	1,714	1,714	0.00	0.0%
East of E Street	1,645	1,645	0.00	0.0%

Notes: dBA=A-weighted decibels

\*Based on data provided by IBI Group.



**Operation-Related Traffic Noise Worksheet: Cumulative\***

Roadway Segment	Existing (PM Peak Trips)	2020		Change in Noise Level (dBA)	Percent Change in Noise Level	Cumulative Change in Noise Level (dBA)	Percent Change in Cumulative Noise Level
		2020 Baseline (PM Peak Trips)	Baseline+Project (PM Peak Trips)				
<b>E Street</b>							
North of 9th Street	517	552	561	0.07	1.6%	0.35	8.5%
Between 9th Street and 8th Street	462	493	507	0.12	2.8%	0.40	9.7%
Between 8th Street and 6th Street	467	498	517	0.16	3.8%	0.44	10.7%
Between 6th Street and 5th Street	497	531	543	0.10	2.3%	0.38	9.3%
South of 5th Street	540	576	588	0.09	2.1%	0.37	8.9%
<b>F Street</b>							
North of 9th Street	182	197	206	0.19	4.6%	0.54	13.2%
Between 9th Street and 8th Street	178	191	203	0.26	6.3%	0.57	14.0%
Between 8th Street and 6th Street	221	237	249	0.21	5.1%	0.52	12.7%
Between 6th Street and 5th Street	240	257	269	0.20	4.7%	0.50	12.1%
South of 5th Street	232	249	263	0.24	5.6%	0.54	13.4%
9th Street							
West of F Street	893	950	954	0.02	0.4%	0.29	6.8%
Between F Street and E Street	889	946	946	0.00	0.0%	0.27	6.4%
East of E Street	933	994	999	0.02	0.5%	0.30	7.1%
<b>8th Street</b>							
West of F Street	88	96	100	0.18	4.2%	0.56	13.6%
Between F Street and E Street	79	87	94	0.34	8.0%	0.76	19.0%
East of E Street	933	994	999	0.02	0.5%	0.30	7.1%
<b>6th Street</b>							
West of F Street	354	378	378	0.00	0.0%	0.28	6.8%
Between F Street and E Street	327	350	350	0.00	0.0%	0.30	7.0%
East of E Street	319	341	348	0.09	2.1%	0.38	9.1%
<b>5th Street</b>							
West of F Street	1,848	1,964	1,971	0.02	0.4%	0.28	6.7%
Between F Street and E Street	1,714	1,821	1,821	0.00	0.0%	0.26	6.2%
East of E Street	1,645	1,749	1,749	0.00	0.0%	0.27	6.3%

Notes: dBA=A-weighted decibels

\*Based on data provided by IBI Group.

## Project-Related Construction Traffic Noise Worksheet

Roadway Segment	Existing (PM Peak Trips) <sup>1</sup>	Existing+Project Construction Trips (PM Peak Trips) <sup>2</sup>	Change in Noise Level (dBA)	Percent Change in Noise Level
<b>E Street</b>				
North of 9th Street	517	574	0.45	11.0%
Between 9th Street and 8th Street	462	519	0.51	12.3%
Between 8th Street and 6th Street	467	524	0.50	12.2%
Between 6th Street and 5th Street	497	554	0.47	11.5%
South of 5th Street	540	597	0.44	10.6%
<b>F Street</b>				
North of 9th Street	182	239	1.18	31.3%
Between 9th Street and 8th Street	178	235	1.21	32.0%
Between 8th Street and 6th Street	221	278	1.00	25.8%
Between 6th Street and 5th Street	240	297	0.93	23.8%
South of 5th Street	232	289	0.95	24.6%
<b>9th Street</b>				
West of F Street	893	950	0.27	6.4%
Between F Street and E Street	889	946	0.27	6.4%
East of E Street	933	990	0.26	6.1%
<b>8th Street</b>				
West of F Street	88	145	2.17	64.8%
Between F Street and E Street	79	136	2.36	72.2%
East of E Street	933	990	0.26	6.1%
<b>6th Street</b>				
West of F Street	354	411	0.65	16.1%
Between F Street and E Street	327	384	0.70	17.4%
East of E Street	319	376	0.71	17.9%
<b>5th Street</b>				
West of F Street	1,848	1,905	0.13	3.1%
Between F Street and E Street	1,714	1,771	0.14	3.3%
East of E Street	1,645	1,702	0.15	3.5%

Notes: dBA=A-weighted decibels

<sup>1</sup>Based on data provided by IBI Group.

<sup>2</sup>It is anticipated that the proposed project would generate a maximum of 57 construction-related trips during the overlap of the building construction, finishing/landscaping, and asphalt paving phases. Addition of construction ADTs to existing roadway peak hour trips provides a conservative estimation. Based on construction data provided.

Existing

**Traffic Turning Volumes Worksheet: Existing**

**AM Peak Hour**

Int	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Totals:				
													NB	SB	EB	WB	
1 E St and 9th St	5	103	9	38	151	14	17	373	13	15	264	29	352	296	728	686	
2 E St and 8th St	4	117	14	9	162	10	2	20	9	2	17	5	305	308	67	62	
3 E St and 6th St	15	117	42	8	152	12	8	162	24	13	60	3	300	363	288	281	
4 E St and 5th St	20	111	27	28	134	20	55	1090	43	17	415	13	361	352	1590	1643	
5 F St and 9th St	18	29	18	16	50	8	10	401	53	11	268	14	127	179	728	758	
6 F St and 8th St	14	73	9	12	96	5	4	17	25	14	13	1	191	231	66	78	
7 F St and 6th St	27	55	18	16	44	22	31	147	27	13	63	13	181	184	270	317	
8 F St and 5th St	12	10	4	8	14	49	78	1231	20	7	438	22	181	67	1710	1828	
													SUMS:	1998	1980	5447	5653

**PM Peak Hour**

Int	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Totals:				
													NB	SB	EB	WB	
1 E St and 9th St	21	235	22	33	141	29	27	369	13	27	430	52	517	459	933	889	
2 E St and 8th St	9	247	12	6	179	8	7	19	5	9	26	15	462	461	87	74	
3 E St and 6th St	23	234	16	14	188	12	12	47	17	19	216	7	467	497	319	327	
4 E St and 5th St	53	222	29	23	164	37	32	628	37	35	912	18	496	540	1645	1699	
5 F St and 9th St	28	55	19	21	37	26	21	406	24	13	388	22	182	176	869	893	
6 F St and 8th St	8	81	8	2	58	13	10	21	8	6	28	14	178	169	79	88	
7 F St and 6th St	29	67	13	8	76	42	15	52	30	25	186	13	221	240	297	354	
8 F St and 5th St	23	30	13	18	35	74	59	694	34	9	964	16	232	144	1714	1848	
													SUMS:	2755	2686	5943	6172

Source: IBI Group

**Traffic Turning Volumes Worksheet: Existing Plus Project**

**AM Peak Hour**

Int	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Totals:				
													NB	SB	EB	WB	
1 E St and 9th St	5	108	12	38	158	14	17	373	13	19	264	29	364	315	735	686	
2 E St and 8th St	4	121	15	9	168	15	5	20	9	4	17	5	323	321	70	70	
3 E St and 6th St	15	126	42	11	158	12	8	162	24	13	60	8	323	378	296	281	
4 E St and 5th St	20	117	27	28	143	20	55	1090	43	17	415	13	376	367	1590	1643	
5 F St and 9th St	20	34	18	16	57	8	10	401	56	11	268	14	139	196	728	763	
6 F St and 8th St	16	75	9	17	99	5	4	17	28	14	13	4	204	241	74	83	
7 F St and 6th St	27	64	18	16	50	22	31	147	27	13	63	13	196	199	270	317	
8 F St and 5th St	12	15	4	8	17	52	83	1231	20	7	438	22	197	75	1710	1836	
													SUMS:	2122	2092	5473	5679

**PM Peak Hour**

Int	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Totals:				
													NB	SB	EB	WB	
1 E St and 9th St	21	240	25	33	145	29	27	369	13	29	430	52	526	473	938	889	
2 E St and 8th St	9	251	13	6	182	11	11	19	5	10	26	15	476	470	89	81	
3 E St and 6th St	23	239	16	18	195	12	12	47	17	19	216	10	486	509	326	327	
4 E St and 5th St	53	229	29	23	169	37	32	628	37	35	912	18	508	552	1645	1699	
5 F St and 9th St	30	60	19	21	41	26	21	406	26	13	388	22	191	189	869	897	
6 F St and 8th St	10	83	8	5	60	13	10	21	10	6	28	18	189	177	86	92	
7 F St and 6th St	29	72	13	8	83	42	15	52	30	25	186	13	233	252	297	354	
8 F St and 5th St	23	33	13	18	39	78	62	694	34	9	964	16	246	151	1714	1855	
													SUMS:	2855	2773	5964	6194

Source: IBI Group

**Traffic Turning Volumes Worksheet: Future 2020 Baseline**

**AM Peak Hour**

Int	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	<b>Totals:</b>			
													NB	SB	EB	WB
1 E St and 9th St	6	110	10	41	161	15	19	396	14	16	281	31	377	317	775	731
2 E St and 8th St	5	125	15	10	172	11	3	22	10	3	19	6	327	330	75	70
3 E St and 6th St	16	125	45	9	162	13	9	172	26	14	64	4	322	388	308	300
4 E St and 5th St	22	118	29	30	143	22	59	1157	46	19	441	14	386	377	1690	1747
5 F St and 9th St	20	31	20	17	54	9	11	426	57	12	285	15	137	194	775	808
6 F St and 8th St	15	78	10	13	102	6	5	19	27	15	14	2	206	247	73	86
7 F St and 6th St	29	59	20	17	47	24	33	156	29	14	67	14	194	198	288	338
8 F St and 5th St	13	11	5	9	15	52	83	1306	22	8	465	24	194	74	1817	1941
													2143	2125	5801	6021

**PM Peak Hour**

Int	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	<b>Totals:</b>			
													NB	SB	EB	WB
1 E St and 9th St	23	250	24	36	150	31	29	392	14	29	457	56	552	490	994	946
2 E St and 8th St	10	263	13	7	190	9	8	21	6	10	28	16	493	492	95	82
3 E St and 6th St	25	249	17	15	200	13	13	50	19	21	230	8	498	531	341	350
4 E St and 5th St	57	236	31	25	174	40	34	667	40	38	968	20	529	576	1749	1806
5 F St and 9th St	30	59	21	23	40	28	23	431	26	14	412	24	197	190	925	950
6 F St and 8th St	9	86	9	3	62	14	11	23	9	7	30	15	191	182	87	96
7 F St and 6th St	31	72	14	9	81	45	16	56	32	27	198	14	237	257	318	378
8 F St and 5th St	25	32	14	20	38	79	63	737	37	10	1023	17	249	156	1821	1964
													2946	2874	6330	6572

Source: IBI Group

**Traffic Turning Volumes Worksheet: Future 2020 Plus Project**

**AM Peak Hour**

Int	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Totals:			
													NB	SB	EB	WB
1 E St and 9th St	6	115	13	41	168	15	19	396	14	20	281	31	389	336	782	731
2 E St and 8th St	5	129	16	10	178	16	6	22	10	5	19	6	345	343	78	78
3 E St and 6th St	16	134	45	12	168	13	9	172	26	14	64	9	345	403	316	300
4 E St and 5th St	22	124	29	30	152	22	59	1157	46	19	441	14	401	392	1690	1747
5 F St and 9th St	22	36	20	17	61	9	11	426	60	12	285	15	149	211	775	813
6 F St and 8th St	17	80	10	18	105	6	5	19	30	15	14	5	219	257	81	91
7 F St and 6th St	29	68	20	17	53	24	33	156	29	14	67	14	209	213	288	338
8 F St and 5th St	13	16	5	9	18	55	88	1306	22	8	465	24	210	82	1817	1949
													2267	2237	5827	6047

**PM Peak Hour**

Int	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Totals:			
													NB	SB	EB	WB
1 E St and 9th St	23	255	27	36	154	31	29	392	14	31	457	56	561	504	999	946
2 E St and 8th St	10	267	14	7	193	12	12	21	6	11	28	16	507	501	97	89
3 E St and 6th St	25	254	17	19	207	13	13	50	19	21	230	11	517	543	348	350
4 E St and 5th St	57	243	31	25	179	40	34	667	40	38	968	20	541	588	1749	1806
5 F St and 9th St	32	64	21	23	44	28	23	431	28	14	412	24	206	203	925	954
6 F St and 8th St	11	88	9	6	64	14	11	23	11	7	30	19	202	190	94	100
7 F St and 6th St	31	77	14	9	88	45	16	56	32	27	198	14	249	269	318	378
8 F St and 5th St	25	35	14	20	42	83	66	737	37	10	1023	17	263	163	1821	1971
													3046	2961	6351	6594

Source: IBI Group