Darnell & Associates, Inc.

TRANSPORTATION PLANNING & TRAFFIC ENGINEERING

September 14, 2016

Neil Patel
Excel Hotel Group
10660 Scripps Ranch Boulevard, Suite 100,
San Diego, California 92131

D&A Ref. No: 160605

Subject: Parking Study for the proposed Springhill Residential Inn Project located on the southside of Wayne Mills Place in Santa Clarita, California.

Dear Mr. Patel,

In accordance with your authorization Darnell & Associates, Inc. (D&A) has analyzed the parking demands of the Hotel A, Hotel B and Denny's Restaurant to determine the recommended parking for the proposed project.

The proposed Valencia Springhill Suites + Residence Inn and Holiday Inn Express hotels project is proposed to be developed on the site of the existing Hotel B (Best Western Hotel) site. Figure 1 is a vicinity map showing the location of the project site and the adjacent existing Hotel A (Holiday Inn Express) and Denny's Restaurant. Figures 2 and 3 depict the project site, underground parking and primary access to Wayne Mills Place. The report has been revised based on discussions with the City of Santa Clarita Planning staff.

PROJECT AREA

The construction of the proposed project proposes the construction of the following:

- Springhill Suites/Residence Inn 182 Rooms
- Holiday Inn Express 108 Rooms

Total: 290 Rooms

The project site is presently occupied by the 120 room Hotel B. Immediately to the north of the project site is the 118 room Hotel A and Denny's Restaurant. The existing Hotel A operations will be moved to the project site and the Hotel B operations will be removed from the project site and occupy the existing Hotel A facility. Figure 4 is a Google Map showing the Hotel B Facility on the project site and the adjacent Hotel A Facilities.

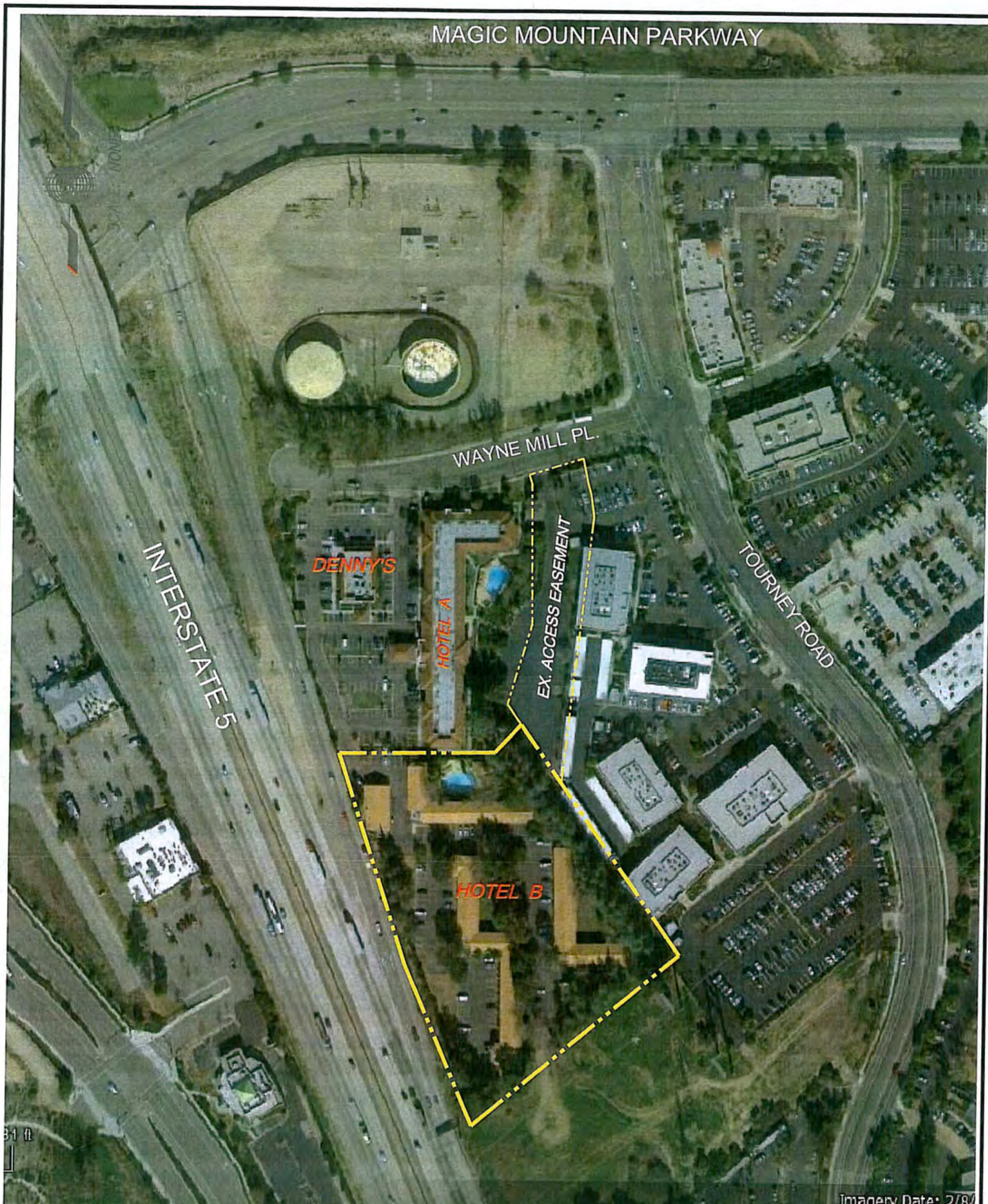
PARKING ANALYSIS

As previously stated the proposed development of the Springhill Suites/Residence Inn Hotel and the Holiday Inn Express Building proposes construction of 274 parking spaces consisting of 203 at grade parking spaces and 71 in the garage under the Springhill Suites/Residence Inn Building.

Based on the City of Santa Clarita Parking requirements the project is required to provide one (1) parking spaces per room resulting in 290 parking spaces (1 space per room times 290 rooms = 290 parking spaces). Therefore the project provides 16 spaces less than the City requirements.

To determine the adequacy of the proposed 274 parking spaces D&A conducted parking demand surveys of the existing Hotel A and Hotel B and the Denny's Restaurant parking for 12 days from Friday June 24, 2016 through July 5, 3016.

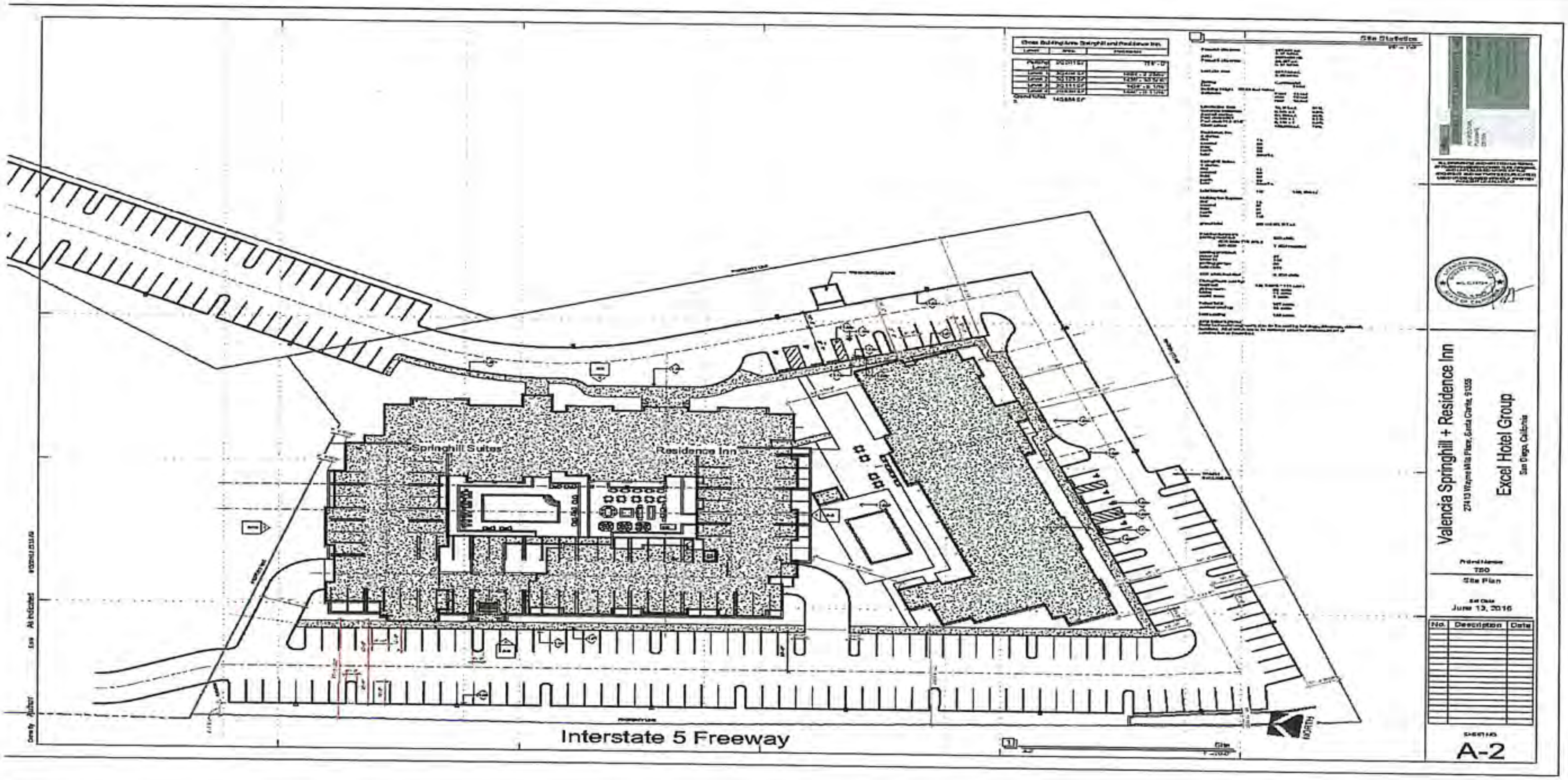
4411 Mercury Street • Suite 207A • San Diego, CA 92111
Phone: 619-233-9373
E-mail: office@darnell-assoc.com



REGISTERED PROFESSIONAL ENGINEER
BILL E. DARNELL
No. 22338
Exp. 9-30-17
CIVIL
STATE OF CALIFORNIA

Darnell & ASSOCIATES, INC.
2870 MERCURY STREET, SUITE 207A
SAN DIEGO, CA 92111
(619) 233-9373
DWG: 160605-AA DATE: SEPTEMBER 13, 2016 BY: DAB

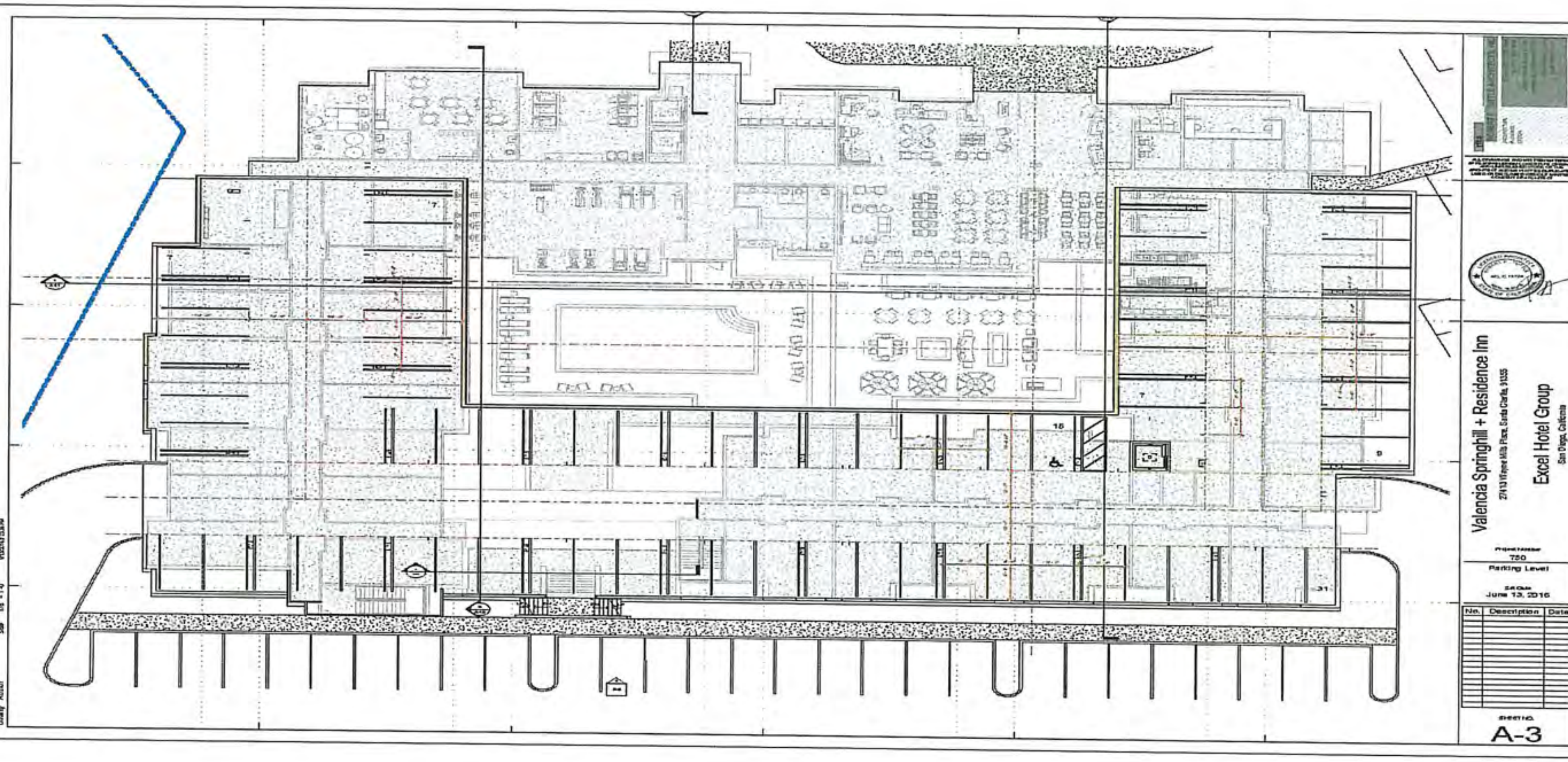
FIGURE 1
VICINITY MAP



Darnell & ASSOCIATES, INC.

160605-AA.dwg 07-29-16 JAM

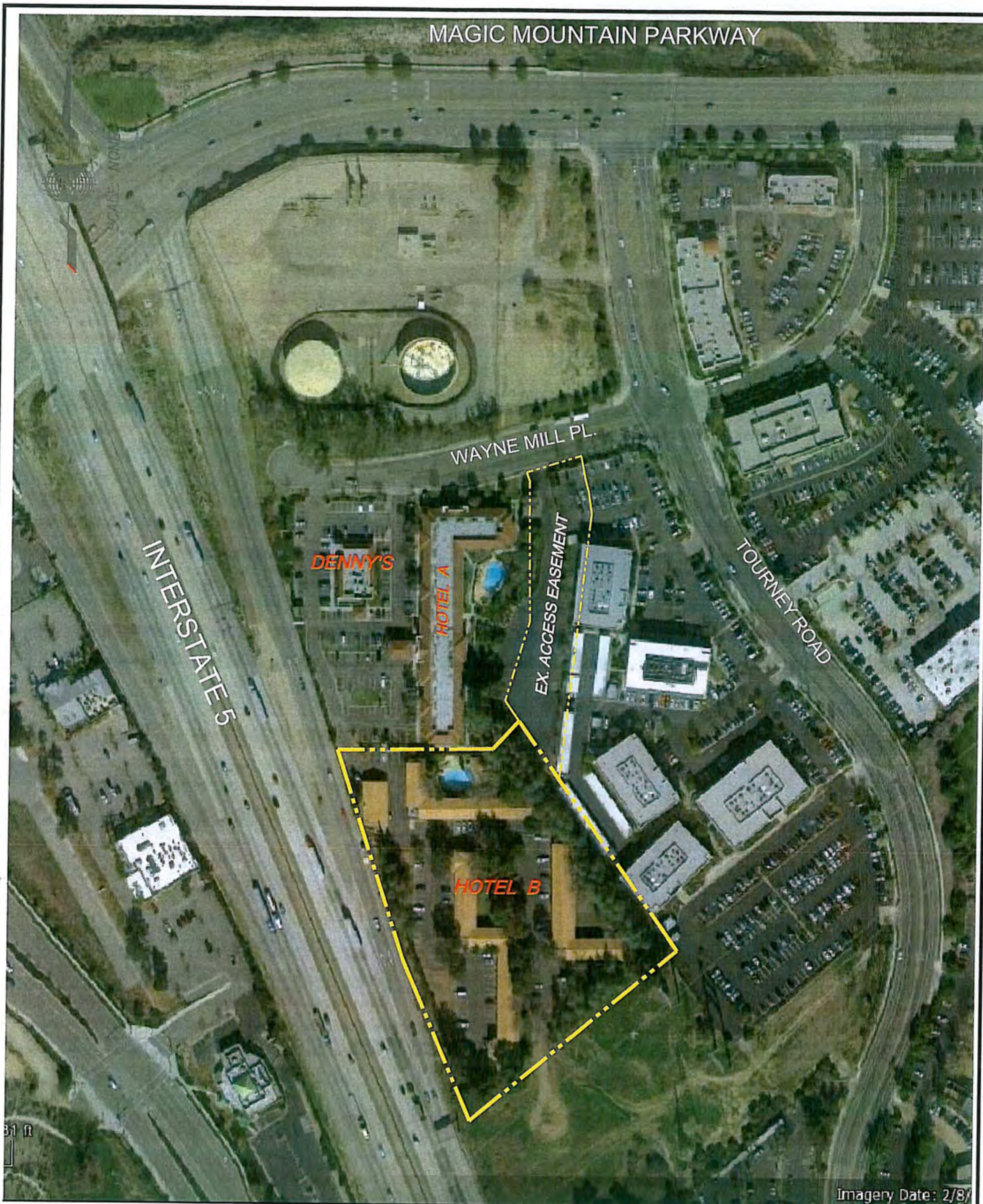
FIGURE 2
PROJECT SITE PLAN



Darnell & ASSOCIATES, INC.

160605-AA.dwg 07-29-16 JAM

FIGURE 3
Garage Parking Plan



REGISTERED PROFESSIONAL ENGINEER
BILL E. DARNELL
No. 22338
Exp. 9-30-17
CIVIL
STATE OF CALIFORNIA

Darnell & ASSOCIATES, INC.
2870 MERCURY STREET, SUITE 207A
SAN DIEGO, CA 92111
(619) 233-9373

DWG: 160605-AA DATE: SEPTEMBER 13, 2016 BY: DAB

FIGURE 4
EXISTING DEVELOPMENT CONDITIONS

A copy of the field survey sheets are presented in Appendix A. Parking demands were collected at the following times:

- 12-1 PM
- 5-6 PM
- 6-7 PM
- 12-1 AM
- 7-8 AM
- 8-9 AM
- 11 AM – 12 PM

The parking areas were broken into three (3) survey areas. Figure 5 and 6 show the survey parking spaces for the Denny's Restaurant and Hotel A and Figure 7 shows the parking survey spaces for Hotel B. The parking areas for the Denny's Restaurant and Hotel A provide 144 parking spaces and the best western provides 167 parking spaces. In addition to the parking surveys D&A obtained room occupancy for each of the two (2) existing hotels for the survey dates.

Table 1 provides summary of the available rooms, occupied rooms and occupancy percentage for each hotel. The Hotel A had one (1) date with 100% occupancy on Saturday June 25, 2016 and the Hotel B had two (2) dates on Friday June 25, 2016 and Saturday June 26, 2016 with 100% occupancy. Table 2 provides a summary of the available 265 parking spaces.

The parking surveys conducted from Friday June 25, 2016 through July 5, 2016 were then broken down into weekday (Monday through Thursday) and weekend (Friday, Saturday and Sunday) parking demands. Table 3 presents the weekday parking demands and Table 4 presents the weekend parking demands. Also presented on Tables 3 and 4 are the calculation of the peak parking demand ratio for each day. Review of Table 3 shows the worst case parking demand was Wednesday June 29, 2016 for the weekday surveys with a parking demand ratio of 0.925 parking spaces per occupied room. For review of Table 4 shows the peak demand for the weekends occurred on Friday June 24, 2016 with a parking demand ratio of 0.865 parking spaces per room. The resulting peak hour demands are shown on Table 5 each day surveyed.

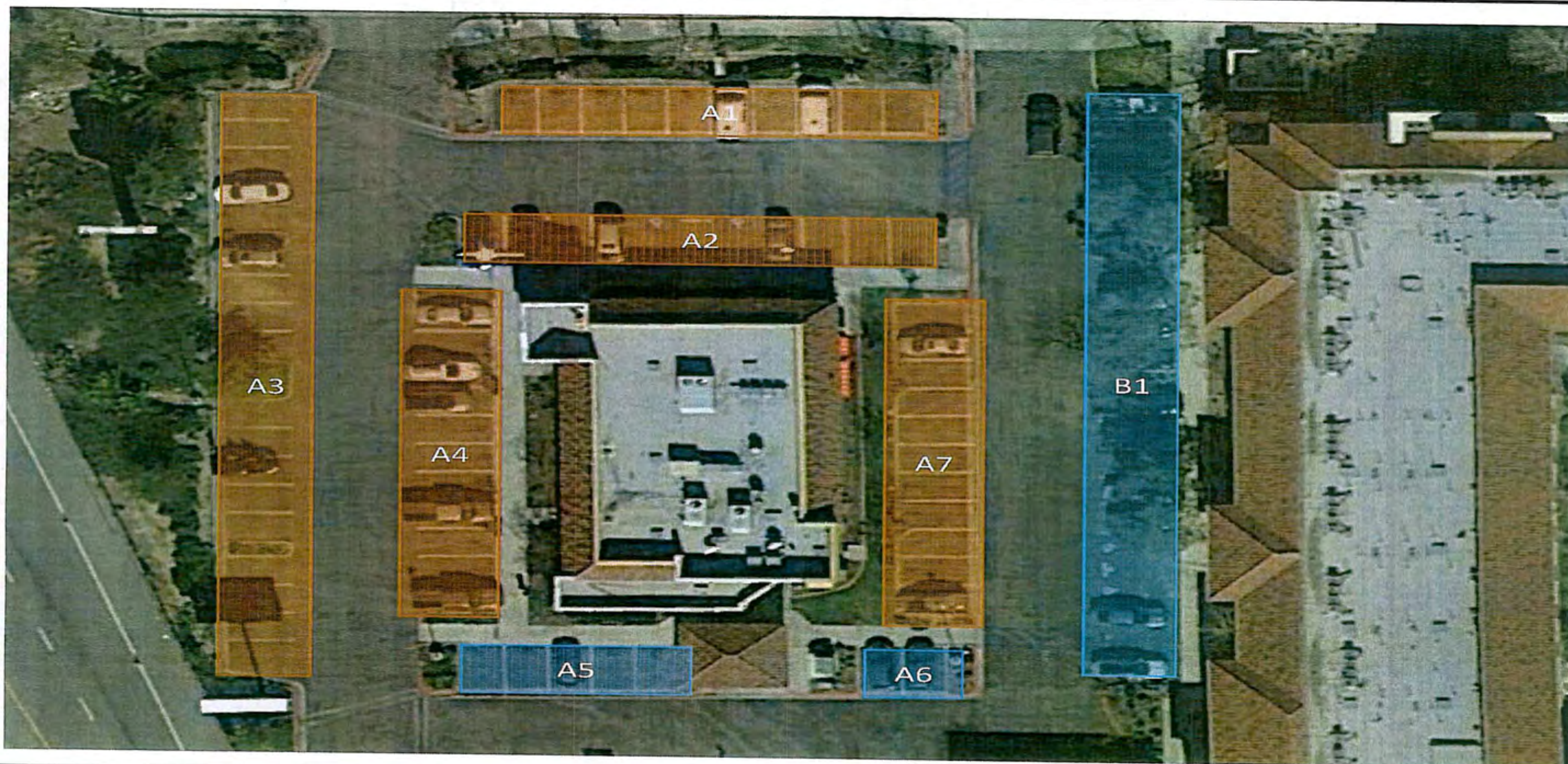
Utilizing the peak parking demand ratio of 0.925 spaces per room the required parking is 268 spaces. Table 6 provides the calculations for the project. Review of Table 6 shows the peak parking demand ratio with the requirement for 268 parking spaces compared to the proposed 274 parking spaces will result in an excess of 6 parking spaces being provided.

The final test on the available parking for the Denny's Restaurant and the existing Hotel A facility was tested using the Urban Land Institute (ULI) 2nd Edition Shared Parking Report and the following City of Santa Clarita Approved Parking requirements for restaurant and hotel uses:

- Denny's Restaurant - 27 Spaces
- Hotel A - 118 Spaces

Total: 145 Spaces

Table 7 was then prepared to show the parking demand by hours based on the ULI hourly rates. Review of Table 7 shows the hourly demands will not exceed the available 144 parking spaces. Further review of Table 7 shows there will be an excess of 12 to 47 spaces each hour.



Darnell & ASSOCIATES, INC.

160605 -AA.dwg 09-14-16 JAM

FIGURE 5

Denny's Resturant/ Hotel A Parking Study Area

Darnell & ASSOCIATES, INC.

160605-AA.dwg 09-14-16 JAM

FIGURE 6

Denny's Rearurant and Hotel A Parking Study Area

Darnell & ASSOCIATES, INC.

160605-AA.dwg 09-14-16 Jam

FIGURE 7
Hotel B Parking Study Area

Table 1 - Summary of Room Occupancy for the Hotel A and the Hotel B
Wayne Mills Place, Santa Clarita California

Day of Week	Hotel A (Area A + Area B)			Hotel B (Area C)			Total Area A + Area B + Area C		
	Total Rooms	Occupied Rooms	Percent (%) of Occupied Rooms	Total Rooms	Occupied Rooms	Percent (%) of Occupied Rooms	Total Rooms	Total Occupied Rooms	Percent (%) of Occupied Rooms
Friday, June 24, 2016	118	94	80%	120	120	100%	238	214	90%
Saturday, June 25, 2016	118	118	100%	120	120	100%	238	238	100%
Sunday, June 26, 2016	118	96	81%	120	115	96%	238	211	89%
Monday, June 27, 2016	118	112	95%	120	113	94%	238	225	95%
Tuesday, June 28, 2016	118	112	95%	120	114	95%	238	226	95%
Wednesday, June 29, 2016	118	106	90%	120	108	90%	238	214	90%
Thursday, June 30, 2016	118	94	80%	120	106	88%	238	200	84%
Friday, July 01, 2016	118	73	62%	120	117	98%	238	190	80%
Saturday, July 02, 2016	118	100	85%	120	119	99%	238	219	92%
Sunday, July 03, 2016	118	79	67%	120	107	89%	238	186	78%
Monday, July 04, 2016	118	64	54%	120	56	47%	238	120	50%
Tuesday, July 05, 2016	118	81	69%	120	89	74%	238	170	71%

Table 2
Summary of Existing Parking Supply for the Denny's Restaurant, Hotel A and the Hotel B, Wayne Mills Place, Santa Clarita, California

Facility	Available Parking Spaces
Denny's Restaurant/ Hotel A	144 Parking Spaces
Hotel B	121 Parking Spaces
Total:	**265 Parking Spaces**

Table 3 - Weekday Parking Demands Summary

Location	Total Capacity	Time	Monday, June 27, 2016 Occupied Parking Spaces	Monday Excess Parking	Monday Occupied Rooms	Tuesday, June 28, 2016 Occupied Parking Spaces	Tuesday Excess Parking	Tuesday Occupied Rooms	Wednesday, June 29, 2016 Occupied Parking Spaces	Wednesday Excess Parking	Wednesday Occupied Rooms	Thursday, June 30, 2016 Occupied Parking Spaces	Thursday Excess Parking	Thursday Occupied Rooms
Area A	**Total Capacity**	**Time**												
Denny's Restaurant/ Hotel A	49	12-1 PM	25	24		17	32		14	35		6	43	
	49	5-6 PM	18	31		16	33		8	41		22	27	
	49	6-7 PM	15	34		22	27		35	14		25	24	
	49	12-1 AM	12	37	N/A	11	38	N/A	47	2	N/A	38	11	N/A
	49	7-8 AM	0	49		24	25		47	2		31	18	
	49	8-9 AM	16	33		19	30		34	15		26	23	
	49	11 AM-12 PM	24	25		11	38		9	40		15	34	
		Peak Demand	**25**			**24**			**47**			**38**		
Area B	**Total Capacity**	**Time**												
Hotel A: Check In at 12 Noon Check out at 10: 00 AM	95	12-1 PM	35	60		35	60		32	63		21	74	
	95	5-6 PM	60	35		53	42		45	50		45	50	
	95	6-7 PM	48	47		62	33		77	18		63	32	
	95	12-1 AM	64	31	94	59	36	118	88	7	96	91	4	73
	95	7-8 AM	0	95		66	29		82	13		86	9	
	95	8-9 AM	70	25		55	40		70	25		64	31	
	95	11 AM-12 PM	59	36		24	71		21	74		28	67	
		Peak Demand	**70**			**66**			**88**			**91**		
Area A plus Area B:	144	12-1 PM	60	84		52	92		46	98		27	117	
	144	5-6 PM	78	66		69	75		53	91		67	77	
	144	6-7 PM	63	81		84	60		112	32		88	56	
	144	12-1 AM	76	68	94	70	74	118	135	9	96	129	15	73
	144	7-8 AM	0	144		90	54		129	15		117	27	
	144	8-9 AM	86	58		74	70		104	40		90	54	
	144	11 AM-12 PM	83	61		35	109		30	114		43	101	
		Peak Demand	**86**			**90**			**135**			**129**		
Area C	**Total Capacity**	**Time**												
Hotel B: Check In at 12 Noon Check out at 10: 00 AM	121	12-1 PM	45	76		29	92		30	91		31	90	
	121	5-6 PM	47	74		76	45		40	81		67	54	
	121	6-7 PM	43	78		86	35		51	70		66	55	
	121	12-1 AM	117	4	120	99	22	120	112	9	115	108	13	117
	121	7-8 AM	79	42		89	32		83	38		94	27	
	121	8-9 AM	63	58		59	62		72	49		79	42	
	121	11 AM-12 PM	36	85		33	88		31	90		24	97	
		Peak Demand	**117**			**99**			**112**			**108**		
Total Demand	**Total Capacity**	**Time**												
Area B+ Area C	216	12-1 PM	80	136		64	152		62	154		52	164	
	216	5-6 PM	107	109		129	87		85	131		112	104	
	216	6-7 PM	91	125		148	68		128	88		129	87	
	216	12-1 AM	181*	35	214	158*	58	238	200*	16	211	199*	17	190
	216	7-8 AM	79	137		155	61		165	51		180	36	
	216	8-9 AM	133	83		114	102		142	74		143	73	
	216	11 AM-12 PM	95	121		57	159		52	164		52	164	
		Peak Demand	**181**			**158**			**200**			**199**		
		Parking/Room Ratio	**0.84 spaces/room**			**0.73 spaces/room**			**0.93 spaces/room**			**0.92 spaces/room**		

Table 4 - Weekend Parking Demands Summary

Location			Dates																				
			Friday, June 24, 2016			Saturday, June 25, 2016			Sunday, June 26, 2016			Friday, July 01, 2016			Saturday, July 02, 2016			Sunday, July 03, 2016			Monday, July 04, 2016		
			Occupied Parking Spaces	Excess Parking	Occupied Rooms	Occupied Parking Spaces	Excess Parking	Occupied Rooms	Occupied Parking Spaces	Excess Parking	Occupied Rooms	Occupied Parking Spaces	Excess Parking	Occupied Rooms	Occupied Parking Spaces	Excess Parking	Occupied Rooms	Occupied Parking Spaces	Excess Parking	Occupied Rooms	Occupied Parking Spaces	Excess Parking	Occupied Rooms
Area A	Total Capacity	Time																					
Denny's Restaurant/ Hotel A	49	12-1 PM	0	49	N/A	20	29	N/A	23	26	N/A	10	39	N/A	7	42	N/A	7	42	N/A	6	43	N/A
	49	5-6 PM	10	39		7	42		9	40		18	31		16	33		14	35		10	39	
	49	6-7 PM	0	49		12	37		16	33		23	26		18	31		22	27		7	42	
	49	12-1 AM	22	27		10	39		24	25		24	25		18	31		22	27		7	42	
	49	7-8 AM	0	49		13	36		40	9		21	28		19	30		22	27		6	43	
	49	8-9 AM	16	33		39	10		47	2		17	32		16	33		12	37		7	42	
	49	11 AM-12 PM	15	34		35	14		25	24		9	40		12	37		7	42		4	45	
	Peak Demand		33			39			47			24			19			22			10		
Area B	Total Capacity	Time																					
Hotel A: Check In at 12 Noon Check out at 10: 00 AM	95	12-1 PM	0	95	94	37	58	118	26	69	96	28	67	73	15	80	100	17	78	79	19	76	64
	95	5-6 PM	40	55		35	60		36	59		52	43		34	61		30	65		38	57	
	95	6-7 PM	0	95		40	55		42	53		58	37		47	48		51	44		50	45	
	95	12-1 AM	91	4		74	21		85	10		65	30		54	41		61	34		57	38	
	95	7-8 AM	0	95		72	23		75	20		76	19		59	36		64	31		54	41	
	95	8-9 AM	62	33		65	30		93	2		58	37		48	47		48	47		37	58	
	95	11 AM-12 PM	38	57		37	58		68	27		24	71		23	72		30	65		24	71	
	Peak Demand		91			74			93			76			59			64			57		
Area C	Total Capacity	Time																					
Hotel B: Check In at 12 Noon Check out at 10: 00 AM	121	12-1 PM	0	121	120	44	77	120	34	87	115	26	95	117	36	85	119	31	90	107	29	92	56
	121	5-6 PM	59	62		38	83		43	78		74	47		73	48		0	121		18	103	
	121	6-7 PM	0	121		43	78		48	73		91	30		75	46		50	71		77	44	
	121	12-1 AM	96	25		0	121		84	37		108	13		112	9		119	2		110	11	
	121	7-8 AM	0	121		0	121		118	3		93	28		61	60		57	64		66	55	
	121	8-9 AM	67	54		98	23		94	27		79	42		55	66		43	78		51	38	
	121	11 AM-12 PM	39	82		45	76		73	48		43	78		47	74		19	102		20	101	
	Peak Demand		96			98			118			108			112			119			110		
Total Demand	Total Capacity	Time																					
Area B+ Area C	216	12-1 PM	0	216	214	81	135	238	60	156	211	54	162	190	51	165	219	48	168	186	48	168	120
	216	5-6 PM	99	117		73	143		79	137		126	90		107	109		30	186		56	160	
	216	6-7 PM	0	216		83	133		90	126		149	67		122	94		101	115		127	89	
	216	12-1 AM	187*	29		74	142		169	47		173*	43		166*	50		180*	36		167*	49	
	216	7-8 AM	0	216		72	144		193*	23		169	47		120	96		121	95		120	96	
	216	8-9 AM	129	87		163*	53		187	29		137	79		103	113		91	125		88	96	
	216	11 AM-12 PM	77	139		82	134		141	75		67	149		70	146		49	167		44	172	
	Peak Demand		187			163			193			173			166			180			167		
	Parking/Room Ratio		0.87 spaces/room			0.76 spaces/room			0.89 spaces/room			0.80 spaces/room			0.77 spaces/room			0.83 spaces/room			0.77 spaces/room		

Table 5 - Summary of Peak Parking Demands for the Hotel A and the Hotel B Wayne Mills Place, Santa Clarita California

Day of Week	Hotel A and Hotel B				
	Occupied Rooms	Peak Parking Demand	Parking Spaces	Excess Parking	Parking Spaces per room
Friday, June 24, 2016	214	187	216	29	0.865
Saturday, June 25, 2016	238	172	216	44	0.796
Sunday, June 26, 2016	211	193	216	23	0.894
Monday, June 27, 2016	225	187	216	29	0.865
Tuesday, June 28, 2016	226	165	216	51	0.764
Wednesday, June 29, 2016	214	200	216	16	0.926
Thursday, June 30, 2016	200	199	216	17	0.921
Friday, July 01, 2016	190	184	216	32	0.851
Saturday, July 02, 2016	219	171	216	45	0.792
Sunday, July 03, 2016	186	183	216	33	0.847
Monday, July 04, 2016	120	167	216	49	0.773

Table 6
Summary of Recommended Parking
for the Valencia Springhill/Residence Inn and the Valencia Holiday Inn Express Hotels, Wayne Mills Place, Santa Clarita, California

Facility	Rooms	Parking Rate	Required Parking Spaces
Valencia Springhill/Residence Inn	182	0.925/per room	168 Parking Spaces
Valencia Holiday Inn Express	108	0.925/per room	100 Parking Spaces
Total Required Parking	**290**	0.925/per room	**268 Parking Spaces**
		Proposed Parking:	**274 Parking Spaces**
		Excess Parking:	**6 Parking Spaces**

Table 7- Shared Parking for Denny's/ Hotel A							
Time	Denny's Resturant (Area A)		Hotel A (Area B)		Area A + B		
	Shared Parking Percentage (a)	Required Parking Spaces 27	Shared Parking Percentage (a)	Required Parking Spaces 118	Shared Parking Spaces	Available Parking Spaces	Excess Parking Spaces
6:00 AM	25%	7	95	112	119	144	+25
7:00 AM	50%	14	95	112	126	144	+18
8:00 AM	60%	16	90	106	122	144	+22
9:00 AM	75%	20	80	94	115	144	+29
10:00 AM	85%	23	70	83	106	144	+28
11:00 AM	90%	24	70	83	107	144	+26
12:00 PM	100%	27	65	77	104	144	+40
1:00 PM	90%	24	65	77	101	144	+42
2:00 PM	50%	14	70	83	96	144	+47
3:00 PM	45%	21	70	83	103	144	+49
4:00 PM	45%	12	75	89	101	144	+34
5:00 PM	75%	20	80	94	115	144	+19
6:00 PM	80%	22	80	94	116	144	+28
7:00 PM	80%	22	85	100	122	144	+28
8:00 PM	80%	22	90	106	128	144	+16
9:00 PM	60%	16	95	112	128	144	+16
10:00 PM	55%	15	95	112	127	144	+20
11:00 PM	50%	14	100	118	132	144	+12

(a) Based on Urban Land Institute Shared Parking 2nd Edition Report

SUMMARY

- The survey of existing parking demands at the Hotel A and Hotel B facilities found peak parking demand of 0.925 parking spaces per room.

- Application of the 0.925 spaces per room to the proposed 290 room Valencia Springhill Suites/Residence Inn and Holiday Inn Express hotels results in the need for 268 parking spaces.

- The proposed 274 parking spaces results in an excess of six (6) parking spaces for the project.

Please call if you have any questions.

Sincerely,

Bill E Darnell

DARNELL & ASSOCIATES, INC.

Bill E. Darnell, P.E. RCE: 22338

REGISTERED PROFESSIONAL ENGINEER
BILL E. DARNELL
No. 22338
CIVIL
STATE OF CALIFORNIA

BED/Jam
160605- Valencia Springhill Parking Study doc/09-16

9/14/2016
(Date)

Appendix A

Appendix A

Parking Lot	Zone	Parking Capacity	Thu, 06/23/16 12-1 PM	Thu, 06/23/16 5-6 PM	Thu, 06/23/16 6-7 PM	Fri, 06/24/16 12-1 AM	Fri, 06/24/16 7-8 AM	Fri, 06/24/16 8-9 AM	Fri, 06/24/16 11 AM-12 PM	Fri, 06/24/16 12-1 PM	Fri, 06/24/16 5-6 PM	Fri, 06/24/16 6-7 PM
Denny's	A1	10		2		6		3	4	4	0	1
	A2	10		4		4		5	5	8	0	4
	A3	18		2		8		5	3	2	2	5
	A4	11		2		4		3	3	6	5	2
	A5	5		2		4		5	3	2	3	2
	A6	2		2		2		2	0	0	1	1
	A7	11		2		10		8	5	6	2	2
Holiday Inn Express	B1	19		9		19		11	10	11	9	8
	B2	11		6		11		7	6	3	6	10
	B3	10		4		10		8	3	4	3	5
	B4	8		5		8		2	1	2	2	2
	B5	2		2		2		2	0	0	0	1
	B6	2		2		2		1	2	2	2	0
	B7	7		1		6		2	1	1	2	2
	B8	9		4		9		8	4	5	3	3
	B9	9		1		8		6	3	1	2	4
Best Western	C2	16		7		14		9	6	4	6	7
	C3	17		5		13		15	7	7	4	4
	C4	13		8		12		8	6	6	4	3
	C5	13		2		3		1	0	0	0	1
	C6	15		4		11		6	3	11	6	8
	C7	7		3		7		2	0	1	0	1
	C8	4		4		4		3	3	1	2	3
	C9	12		8		10		8	4	5	4	4
	C10	18		13		17		9	7	6	7	8

Parking Lot	Zone	Parking Capacity	Sat, 06/25/16							Sun, 06/26/16						
			12-1 AM	7-8 AM	8-9 AM	11 AM-12 PM	12-1 PM	5-6 PM	6-7 PM	12-1 AM	7-8 AM	8-9 AM	11 AM-12 PM	12-1 PM	5-6 PM	6-7 PM
Denny's	A1	10	2	3	8	8	4	0	3	10	10	10	4	4	2	1
	A2	10	3	1	10	7	4	6	5	2	7	8	5	8	4	4
	A3	18	2	5	13	13	9	0	3	6	14	18	6	7	6	6
	A4	11	3	4	8	7	6	3	5	6	9	11	10	6	6	4
	A5	5	5	4	5	5	4	1	2	4	5	5	4	2	2	2
	A6	2	2	2	2	1	0	1	1	2	2	2	2	0	0	0
	A7	11	6	7	8	9	4	5	5	9	9	11	9	6	8	6
Holiday Inn Express	B1	19	18	19	18	14	6	9	13	19	17	18	15	10	10	14
	B2	11	11	10	11	5	4	6	7	11	8	11	8	3	9	7
	B3	10	10	10	8	4	3	5	5	9	7	10	9	4	7	6
	B4	8	8	7	8	5	2	4	5	4	5	8	7	2	6	5
	B5	2	2	2	2	0	1	0	1	2	2	2	1	0	2	0
	B6	2	2	5	2	0	2	2	1	2	2	2	2	2	2	1
	B7	7	6	2	1	0	1	2	1	5	2	7	2	1	2	1
	B8	9	9	8	8	5	4	7	7	9	8	9	5	2	6	6
	B9	9	8	9	7	4	3	1	2	9	8	8	4	3	6	0
Best Western	C2	16			14	5	6	6	6	11	15	13	12	5	6	5
	C3	17			15	9	7	7	6	7	17	12	7	3	3	3
	C4	13			11	8	3	2	3	7	13	11	3	5	6	0
	C5	13			7	1	1	0	0	2	13	9	4	3	0	3
	C6	15			13	4	2	6	7	15	14	13	15	7	6	13
	C7	7			5	0	0	2	2	3	7	6	2	0	6	0
	C8	4			2	3	1	2	4	4	4	4	3	4	1	1
	C9	12			11	4	5	5	4	12	12	7	9	7	6	6
	C10	18			15	6	5	7	11	18	17	14	13	8	8	8

Parking Lot	Zone	Parking Capacity	Mon, 06/27/16 12-1 AM	7-8 AM	8-9 AM	11 AM-12 PM	12-1 PM	5-6 PM	6-7 PM	Tue, 06/28/16 12-1 AM	7-8 AM	8-9 AM	11 AM-12 PM	12-1 PM	5-6 PM	6-7 PM
Denny's	A1	10	3		3	4	4	6	6	2	6	5	4	2	2	8
	A2	10	2		5	5	3	5	6	3	5	5	3	4	2	7
	A3	18	5		2	8	8	2	5	4	9	6	2	6	2	11
	A4	11	2		6	7	2	3	5	2	4	3	2	2	2	9
	A5	5	0		3	2	1	0	2	0	3	3	1	3	1	3
	A6	2	0		2	0	1	0	2	2	2	1	1	1	1	1
	A7	11	4		7	4	2	4	5	1	6	4	3	2	3	9
Holiday Inn Express	B1	19	18		14	12	8	11	19	17	10	8	4	8	4	14
	B2	11	10		8	10	6	9	10	10	8	6	3	4	4	10
	B3	10	10		7	6	6	5	6	7	8	6	3	4	7	10
	B4	8	8		8	5	2	6	6	6	6	4	2	5	6	6
	B5	2	2		1	2	2	2	2	2	2	2	1	0	2	2
	B6	2	2		2	2	2	2	2	2	2	2	0	1	2	2
	B7	7	2		3	2	1	2	2	2	6	6	3	0	3	6
	B8	9	6		7	7	2	6	4	5	6	6	2	4	8	7
	B9	9	2		8	7	2	6	2	5	7	7	1	0	4	7
Best Western	C2	16	12	7	5	5	2	7	6	9	13	5	3	4	7	10
	C3	17	17	12	12	3	2	10	11	10	12	9	9	7	2	4
	C4	13	13	8	8	5	3	4	10	9	12	10	4	1	2	5
	C5	13	13	10	6	1	1	7	8	10	5	3	0	0	2	3
	C6	15	15	9	7	7	4	12	13	15	12	8	5	4	5	7
	C7	7	7	2	0	1	0	7	7	7	3	1	0	0	2	2
	C8	4	4	4	4	3	1	3	4	4	4	3	1	0	3	1
	C9	12	12	8	5	4	6	7	12	12	9	6	2	3	4	4
	C10	18	18	16	10	4	4	15	12	17	13	9	5	5	8	11

Parking Lot	Zone	Parking Capacity	Wed, 06/29/16							Thu, 06/30/16						
			12-1 AM	7-8 AM	8-9 AM	11 AM-12 PM	12-1 PM	5-6 PM	6-7 PM	12-1 AM	7-8 AM	8-9 AM	11 AM-12 PM	12-1 PM	5-6 PM	6-7 PM
Denny's	A1	10	10	10	8	3	1	5	6	9	7	5	3	2	5	6
	A2	10	10	10	7	3	2	6	7	9	6	5	3	1	4	6
	A3	18	16	17	10	2	2	6	6	13	12	10	5	3	6	7
	A4	11	11	10	9	1	1	5	6	7	6	6	4	4	3	4
	A5	5	5	5	4	1	2	4	5	4	5	1	2	2	3	4
	A6	2	2	2	2	1	2	1	2	2	2	1	1	0	2	2
	A7	11	9	9	9	3	3	4	7	9	11	5	4	4	5	6
Holiday Inn Express	B1	19	18	17	14	3	2	8	11	19	17	15	6	5	8	8
	B2	11	10	9	8	1	2	7	9	11	10	9	5	5	6	7
	B3	10	10	9	7	1	3	7	6	10	10	8	4	5	4	5
	B4	8	7	7	6	3	1	4	5	8	7	6	1	3	6	6
	B5	2	2	2	2	2	1	2	2	2	2	2	0	0	2	2
	B6	2	2	2	2	2	0	1	2	2	2	2	0	0	1	2
	B7	7	7	6	4	2	2	2	4	7	5	5	2	1	4	5
	B8	9	8	6	5	1	2	3	4	8	7	6	3	3	6	6
	B9	9	8	8	7	1	1	2	6	9	8	4	0	0	5	5
Best Western	C2	16	16	11	9	5	4	7	6	14	8	7	5	6	1	16
	C3	17	9	16	16	6	8	10	12	13	16	14	5	6	11	15
	C4	13	13	11	9	4	2	3	4	11	10	12	0	1	11	9
	C5	13	12	5	4	0	0	6	5	8	8	7	2	0	5	7
	C6	15	15	10	8	2	3	11	10	15	14	8	1	2	15	13
	C7	7	7	5	4	0	1	0	6	7	6	5	0	0	0	0
	C8	4	4	3	2	2	0	3	3	4	1	1	2	1	3	2
	C9	12	12	4	3	4	4	10	4	12	9	7	6	5	10	7
	C10	18	18	12	11	6	8	13	13	18	16	14	3	4	14	16

Parking Lot	Zone	Parking Capacity	Fri, 07/01/16							Sat, 07/02/16						
			12-1 AM	7-8 AM	8-9 AM	11 AM-12 PM	12-1 PM	5-6 PM	6-7 PM	12-1 AM	7-8 AM	8-9 AM	11 AM-12 PM	12-1 PM	5-6 PM	6-7 PM
Denny's	A1	10	7	5	4	2	1	3	5	5	5	5	4	1	2	6
	A2	10	6	5	4	1	1	4	4	4	5	5	4	3	3	5
	A3	18	7	7	5	4	3	6	5	4	6	4	3	1	4	5
	A4	11	4	4	4	2	2	3	4	5	3	2	1	2	5	6
	A5	5	4	5	3	2	1	2	3	3	4	2	1	0	1	2
	A6	2	2	2	2	0	0	1	2	2	2	1	1	0	2	2
	A7	11	6	9	6	2	1	4	4	6	6	4	1	2	4	6
Holiday Inn Express	B1	19	9	16	11	3	2	3	5	6	12	12	9	3	3	6
	B2	11	9	9	7	5	3	4	6	7	7	7	1	2	3	7
	B3	10	7	10	8	5	3	4	6	7	7	6	5	2	4	8
	B4	8	7	8	6	3	1	6	8	8	6	5	1	3	4	5
	B5	2	2	2	2	0	1	2	2	2	2	1	0	0	0	1
	B6	2	2	2	2	0	0	0	2	2	2	2	0	1	2	2
	B7	7	6	2	1	2	1	2	1	2	2	1	1	1	2	1
	B8	9	5	6	5	1	1	3	4	4	6	5	2	0	3	6
	B9	9	6	5	5	1	1	3	4	5	3	2	1	3	2	5
Best Western	C2	16	15	11	9	4	5	11	12	16	6	9	10	6		0
	C3	17	16	16	16	6	5	8	8	16	5	11	3	5		7
	C4	13	13	12	11	5	9	6	6	13	6	6	4	2		9
	C5	13	8	8	6	3	1	7	7	13	5	5	1	1		8
	C6	15	15	7	5	6	3	11	11	15	4	6	4	2		5
	C7	7	2	6	5	1	0	6	6	3	1	1	0	1		0
	C8	4	4	3	3	1	0	3	3	4	3	2	1	1		0
	C9	12	11	10	8	8	7	4	4	12	7	3	3	3		3
	C10	18	18	14	12	6	4	13	14	15	18	6	16	6		12

Parking Lot	Zone	Parking Capacity	Sun, 07/03/16							Mon, 07/04/16						
			12-1 AM	7-8 AM	8-9 AM	11 AM-12 PM	12-1 PM	5-6 PM	6-7 PM	12-1 AM	7-8 AM	8-9 AM	11 AM-12 PM	12-1 PM	5-6 PM	6-7 PM
Denny's	A1	10	6	6	4	3	2	3	2	2	2	1	0	2	2	4
	A2	10	5	5	3	1	1	2	2	2	1	1	0	1	2	4
	A3	18	5	5	2	1	1	2	1	1	1	2	1	2	2	6
	A4	11	6	6	3	2	2	3	2	2	2	3	3	0	3	2
	A5	5	3	3	2	1	1	2	4	4	3	0	0	1	1	1
	A6	2	2	2	1	1	1	2	1	1	1	0	0	1	1	2
	A7	11	4	4	3	2	2	4	3	3	3	2	4	3	3	5
Holiday Inn Express	B1	19	8	8	8	5	4	6	6	7	7	5	3	4	5	6
	B2	11	9	9	7	4	2	7	7	9	9	7	4	4	5	7
	B3	10	9	9	6	5	1	4	7	9	9	6	3	5	5	7
	B4	8	7	8	5	2	1	6	6	7	6	4	2	4	4	5
	B5	2	2	2	0	0	0	0	2	2	2	2	1	0	2	2
	B6	2	2	2	2	1	0	2	2	2	1	1	0	2	2	2
	B7	7	2	1	2	2	2	1	2	1	2	2	2	2	2	2
	B8	9	7	8	6	4	3	2	5	6	5	4	2	3	4	5
	B9	9	6	8	6	3	2	2	5	6	6	4	3	3	5	5
Best Western	C2	16	16	1	11	2	4	6	10	12	9	8	4	3		6
	C3	17	17	17	13	2	4	7	12	15	8	5	7	7		12
	C4	13	13	2	2	1	2	9	13	13	7	5	5	7		13
	C5	13	13	13	1	2	4	0	2	13	6	5	3	0		1
	C6	15	15	15	3	1	1	15	15	15	8	6	3	0		1
	C7	7	5	1	2	0	1	1	1	3	5	3	0	0		0
	C8	4	4	4	2	2	2	1	4	4	4	4	0	0		0
	C9	12	12	2	2	3	4	1	6	11	7	5	2	12		6
	C10	18	18	1	3	5	6	5	10	18	8	7	14	2		5

Parking Lot	Zone	Parking Capacity	Tue, 07/05/16						
			12-1 AM	7-8 AM	8-9 AM	11 AM-12 PM	12-1 PM	5-6 PM	6-7 PM
Denny's	A1	10	4	4	3	2	1	4	3
	A2	10	4	3	2	1	0	4	3
	A3	18	6	5	3	1	0	3	2
	A4	11	3	3	2	1	1	6	4
	A5	5	3	3	2	3	2	3	2
	A6	2	2	2	1	1	2	2	2
	A7	11	5	5	4	5	1	4	3
Holiday Inn Express	B1	19	7	8	6	2	1	6	7
	B2	11	6	8	7	3	1	4	4
	B3	10	7	7	6	2	2	4	6
	B4	8	5	6	6	2	2	3	3
	B5	2	2	2	1	0	0	2	0
	B6	2	2	2	1	1	2	2	2
	B7	7	1	2	2	1	2	1	2
	B8	9	5	6	5	3	3	4	5
	B9	9	6	5	4	2	2	4	7
Best Western	C2	16	8	10	9	1		6	6
	C3	17	0	8	8	7		13	8
	C4	13	13	7	5	1		3	8
	C5	13	2	1	0	0		3	6
	C6	15	2	5	3	2		11	7
	C7	7	0	4	1	1		6	5
	C8	4	0	4	3	0		2	3
	C9	12	8	4	2	0		4	4
	C10	18	10	14	13	5		14	9

WAYNE MILLS PLACE PROJECT

AIR QUALITY IMPACT ANALYSIS

PREPARED BY

Michael Baker

INTERNATIONAL

NOVEMBER 2016

1.0 INTRODUCTION

2.0 AIR QUALITY

TABLES

FIGURES

APPENDICES

This page is intentionally left blank.

1.0 INTRODUCTION

This report evaluates air quality impacts associated with the proposed Wayne Mills Place Project in accordance with methodologies recommended by the California Air Resources Board (CARB) and the South Coast Air Quality Management District (SCAQMD). Analyzed in this report are the project's consistency with applicable plans, policies, and regulations, as well as the introduction of new sources of air pollutants. Where quantification was required, emissions were modeled using the California Emissions Estimator Model (CalEEMod). Technical data is included as Appendix A, *Criteria Air Pollutant Modeling Outputs*.

1.1 PROJECT LOCATION

The project site is located at 27413 Wayne Mills Place in Santa Clarita, California, in Los Angeles County. The site is on the south side of Wayne Mills Place, east of Interstate 5 (I-5) and west of Tourney Road. Nearby communities include Castaic to the north, Acton to the east, and San Fernando to the south. Refer to Figure 1-1, *Project Location.*

Surrounding land uses include I-5 directly to the west, restaurants to the north, a business park to the east, and the Valencia Country Club golf course to the south and east. Six Flags Magic Mountain theme park is on the opposite side of I-5 from the project site.

1.2 PROJECT DESCRIPTION

The project would demolish an existing 120-room Best Western hotel and construct two new hotel buildings in its place, one Holiday Inn Express with 108 rooms and one Springhill Suites/ Residence Inn with 182 rooms, on a 4.3-acre site. There would be a total of 192 automobile parking spots with access from an existing driveway located on Wayne Mills Place. Refer to Figure 1-2, *Site Plan.*

This page is intentionally left blank.

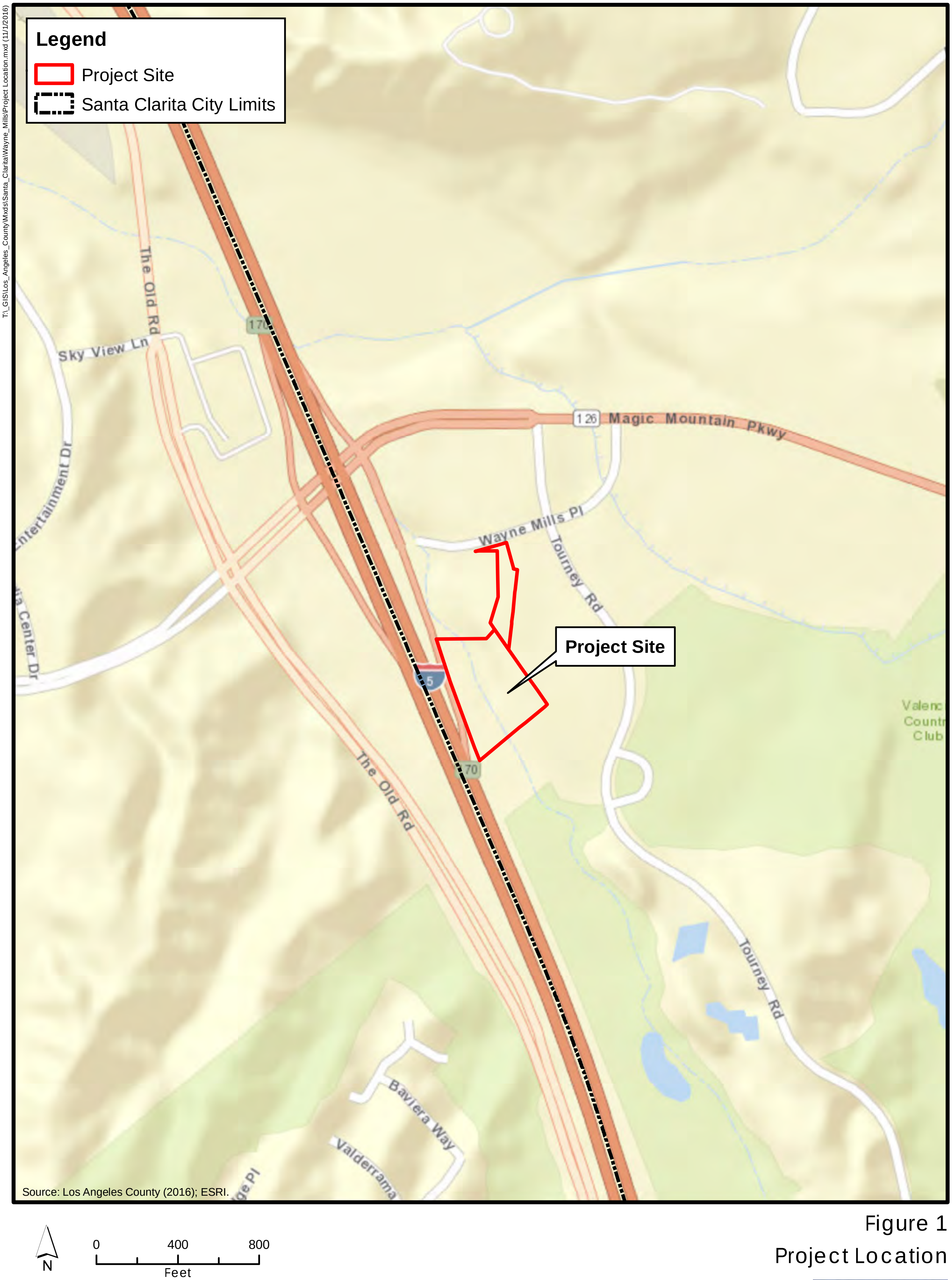
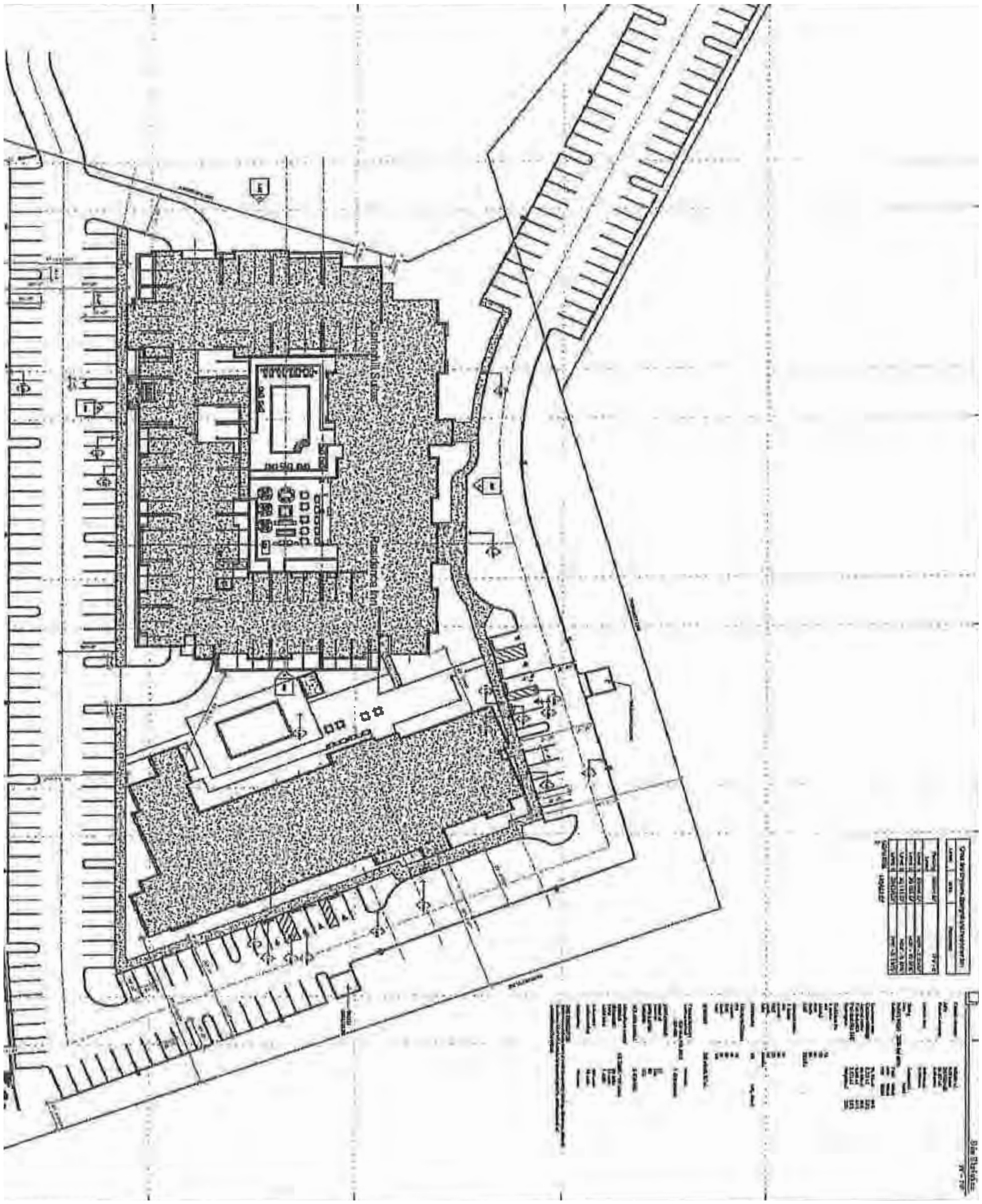


Figure 1
Project Location

Michael Baker
INTERNATIONAL

W:\Santa Clarita, City of\Waynes Mills Place\Figures



Source: Darnell & Associates, Inc.

Not To Scale

FIGURE 2

Site Plan

Michael Baker INTERNATIONAL

2.0 AIR QUALITY

This report describes the existing air quality–related setting in the project region, summarizes applicable air quality regulations, and analyzes potential short- and long-term impacts that could result from implementation of the proposed Wayne Mills Place Project.

2.1 EXISTING SETTING

South Coast Air Basin

CARB divides the state into 15 air basins that share similar meteorological and topographical features. The project site is in the western portion of the South Coast Air Basin (Basin). The Basin is a 6,600-square-mile area bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto mountains to the north and east. The Basin includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties, in addition to the San Gorgonio Pass area in Riverside County. The Basin's terrain and geographical location (i.e., a coastal plain with connecting broad valleys and low hills) determine its distinctive climate.

The general region lies in the semi-permanent high-pressure zone of the eastern Pacific. The climate is mild and tempered by cool sea breezes. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. The extent and severity of the air pollution problem in the Basin is a function of the area's natural physical characteristics (weather and topography), as well as man-made influences (development patterns and lifestyle). Factors such as wind, sunlight, temperature, humidity, rainfall, and topography all affect the accumulation and/or dispersion of pollutants throughout the Basin.

Air Pollutants of Concern

The air pollutants emitted into the ambient air by stationary and mobile sources are regulated by federal and state laws. These regulated air pollutants are known as "criteria air pollutants" and are categorized into primary and secondary pollutants. Primary air pollutants are those that are emitted directly from sources. Carbon monoxide (CO), reactive organic gases (ROG), nitrogen oxide (NO_X), sulfur dioxide (SO_2), coarse particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), lead, and fugitive dust are primary air pollutants. Of these, CO, SO_2, PM_{10}, and $PM_{2.5}$ are criteria pollutants. ROG and NO_X are criteria pollutant precursors and go on to form secondary criteria pollutants through chemical and photochemical reactions in the atmosphere (for example, ozone (O_3) is formed by a chemical reaction between ROG and NOx in the presence of sunlight). O_3 and nitrogen dioxide (NO_2) are the principal secondary pollutants.

Sources and health effects commonly associated with criteria pollutants are summarized in Table 2-1, *Criteria Air Pollutants Summary of Common Sources and Effects*.

TABLE 2-1: CRITERIA AIR POLLUTANTS SUMMARY OF COMMON SOURCES AND EFFECTS

Pollutant	Major Man-Made Sources	Human Health & Welfare Effects
Carbon Monoxide (CO)	An odorless, colorless gas formed when carbon in fuel is not burned completely; a component of motor vehicle exhaust.	Reduces the ability of blood to deliver oxygen to vital tissues, affecting the cardiovascular and nervous system. Impairs vision, causes dizziness, and can lead to unconsciousness or death.
Nitrogen Dioxide (NO_2)	A reddish-brown gas formed during fuel combustion for motor vehicles and industrial sources. Sources include motor vehicles, electric utilities, and other sources that burn fuel.	Respiratory irritant; aggravates lung and heart problems. Precursor to ozone and acid rain. Contributes to global warming and nutrient overloading which deteriorates water quality. Causes brown discoloration of the atmosphere.
Ozone (O_3)	Formed by a chemical reaction between volatile organic compounds (VOC) and nitrous oxides (NOx) in the presence of sunlight. VOCs are also commonly referred to as reactive organic gases (ROGs). Common sources of these precursor pollutants include motor vehicle exhaust, industrial emissions, gasoline storage and transport, solvents, paints, and landfills.	Irritates and causes inflammation of the mucous membranes and lung airways; causes wheezing, coughing, and pain when inhaling deeply; decreases lung capacity; aggravates lung and heart problems. Damages plants; reduces crop yield. Damages rubber, some textiles, and dyes.
Particulate Matter (PM_{10} and $PM_{2.5}$)	Produced by power plants, steel mills, chemical plants, unpaved roads and parking lots, wood-burning stoves and fireplaces, automobiles, and others.	Increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing; aggravated asthma; development of chronic bronchitis; irregular heartbeat; nonfatal heart attacks; and premature death in people with heart or lung disease. Impairs visibility (haze).
Sulfur Dioxide (SO_2)	A colorless, nonflammable gas formed when fuel containing sulfur is burned; when gasoline is extracted from oil; or when metal is extracted from ore. Examples are petroleum refineries, cement manufacturing, metal processing facilities, locomotives, and ships.	Respiratory irritant. Aggravates lung and heart problems. In the presence of moisture and oxygen, sulfur dioxide converts to sulfuric acid which can damage marble, iron and steel. Damages crops and natural vegetation. Impairs visibility. Precursor to acid rain.

Source: CAPCOA 2013

Ambient Air Quality

Criteria Air Pollutant Monitoring Data

Ambient air quality in Santa Clarita, and thus at the project site, can be inferred from ambient air quality measurements conducted at air quality monitoring stations. Existing levels of ambient air quality and historical trends in the region are documented by measurements made by the SCAQMD, the air pollution regulatory agency in the air basin that maintains air quality monitoring stations which process ambient air quality measurements.

Ozone, PM_{10}, and $PM_{2.5}$ are the primary pollutants affecting the SCAQMD. The nearest air quality monitoring site to the project site that monitors ambient concentrations of ozone and airborne particulates is the Santa Clarita-Placerita Monitoring Station (22224 Placerita Canyon, Santa Clarita, CA 91321), approximately 4 miles southeast of the project site. Table 2-2, *Ambient Air*

Quality Monitoring Data, summarizes the published data since 2013 for each year that the monitoring data is provided.

TABLE 2-2: AMBIENT AIR QUALITY MONITORING DATA

Pollutant Standards	2013[1]	2014[1]	2015[1]
Ozone			
Maximum 1-hour concentration (ppm)	0.134	0.134	0.126
Maximum 8-hour concentration (ppm) (state/federal)	0.104 **/** 0.104	0.111 **/** 0.110	0.109 **/** 0.108
Number of days above state 1-hour standard	30	32	23
Number of days above state/federal 8-hour standard	58 / 40	65 / 45	55 / 37
Coarse Particulate Matter			
Maximum 24-hour concentration (μg/m³) (state/federal)	41.0 / 43.0	45.0 / 47.0	39.0 / 41.0
Number of days above state/federal standard	0 / 0	0 / 0	* / 0
Fine Particulate Matter			
Maximum 24-hour concentration (μg/m³) (state/federal)	29.5 / *	28.9 / *	34.4 / *
Number of days above federal standard	*	*	*

Source: CARB 2015a

*Notes: μg/m³ = micrograms per cubic meter; ppm = parts per million; * = No data is currently available to determine the value.*

1. Measurements taken at the Santa Clarita-Placerita Monitoring Station.

Toxic Air Contaminants

In addition to the criteria pollutants discussed above, toxic air contaminants (TACs) are another group of pollutants of concern. TACs are considered either carcinogenic or noncarcinogenic based on the nature of the health effects associated with exposure to the pollutant. For regulatory purposes, carcinogenic TACs are assumed to have no safe threshold below which health impacts would not occur, and cancer risk is expressed as excess cancer cases per one million exposed individuals. Noncarcinogenic TACs differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis.

There are many different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes, such as petroleum refining and chrome-plating operations; commercial operations, such as gasoline stations and dry cleaners; and motor vehicle exhaust. Public exposure to TACs can result from emissions from normal operations, as well as from accidental releases of hazardous materials during upset conditions. The health effects associated with TACs are quite diverse and generally are assessed locally, rather than regionally. TACs can cause long-term health effects such as cancer, birth defects, neurological damage, asthma, bronchitis, or genetic damage, or short-term acute affects such as eye watering, respiratory irritation (a cough), runny nose, throat pain, and headaches.

Since the last update to the TAC list in December 1999, CARB has designated 244 compounds as toxic air contaminants (CARB 1999). Additionally, CARB has implemented control measures for a number of compounds that pose high risks and show potential for effective control. The majority of the estimated health risks from TACs can be attributed to a relatively few compounds.

CARB identified diesel particulate matter (DPM) as a toxic air contaminant. Diesel particulate matter differs from other TACs in that it is not a single substance but rather a complex mixture of hundreds of substances. Diesel exhaust is a complex mixture of particles and gases produced when an engine burns diesel fuel. DPM is a concern because it causes lung cancer; many compounds found in diesel exhaust are carcinogenic. DPM includes the particle-phase constituents in diesel exhaust. The chemical composition and particle sizes of DPM vary between different engine types (heavy-duty, light-duty), engine operating conditions (idle, accelerate, decelerate), fuel formulations (high/low sulfur fuel), and the year of the engine (EPA 2002). Some short-term (acute) effects of diesel exhaust include eye, nose, throat, and lung irritation, and diesel exhaust can cause coughs, headaches, light-headedness, and nausea. DPM poses the greatest health risk among the TACs. Almost all diesel exhaust particle mass is 10 microns or less in diameter. Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lung.

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill, and the chronically ill, especially those with cardiorespiratory diseases.

Residential areas are considered to be sensitive receptors to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Children are considered more susceptible to health effects of air pollution due to their immature immune systems and developing organs (OEHHA 2007). As such, schools are also considered sensitive receptors, as children are present for extended durations and engage in regular outdoor activities. Other land uses considered sensitive receptors include playgrounds, childcare centers, long-term healthcare facilities, rehabilitation centers, convalescent centers, and retirement homes. The nearest sensitive receptors are the residences approximately 400 meters southwest of the project site, across I-5.

2.2 REGULATORY FRAMEWORK

Federal and State

<u>*Ambient Air Quality Standards*</u>

The proposed project has the ability to release gaseous emissions of criteria pollutants and dust into the ambient air; therefore, development activities under the proposed project fall under the ambient air quality standards promulgated at the local, state, and federal levels. The federal Clean Air Act of 1971 and the Clean Air Act Amendments (1977) established the national ambient air quality standards (NAAQS), which are promulgated by the US Environmental Protection

Agency (EPA). The State of California has also adopted its own California ambient air quality standards (CAAQS), which are promulgated by CARB. The project is in Los Angeles County, which is under the air quality regulatory jurisdiction of the South Coast Air Quality Management District, and is therefore subject to the rules and regulations adopted by the air district to achieve the NAAQS and CAAQS. Applicable federal, state, regional, and local laws, regulations, plans, and guidelines relevant to the California Environmental Quality Act (CEQA) review process are summarized below. As shown in Table 2-3, *Air Quality Standards*, these pollutants include O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety.

TABLE 2-3: AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards	National Standards
Ozone (O_3)	8 Hour	0.070 ppm (137µg/m^3)	0.070 ppm (137µg/m^3)
	1 Hour	0.09 ppm (180 µg/m^3)	—
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
	1 Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)
Nitrogen Dioxide (NO_2)	1 Hour	0.18 ppm (339 µg/m^3)	100 ppb
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	53 ppb (100 µg/m^3)
Sulfur Dioxide (SO_2)	24 Hour	0.04 ppm (105 µg/m^3)	N/A
	3 Hour	—	N/A
	1 Hour	0.25 ppm (665 µg/m^3)	75 ppb
Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	N/A
	24 Hour	50 µg/m^3	150 µg/m^3
Particulate Matter – Fine ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m^3	15 µg/m^3
	24 Hour	N/A	35 µg/m^3
Sulfates	24 Hour	25 µg/m^3	N/A
Lead	Calendar Quarter	N/A	1.5 µg/m^3
	30 Day Average	1.5 µg/m^3)	N/A
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	N/A
Vinyl Chloride (chloroethene)	24 Hour	0.01 ppm (26 µg/m^3)	N/A
Visibility-Reducing Particles	8 Hour (10:00 to 18:00 PST)	—	N/A

Source: CARB 2015b

Notes: mg/m^3=milligrams per cubic meter; ppm=parts per million; ppb=parts per billion; µg/m^3=micrograms per cubic meter

Air Quality Attainment Plans

The SCAQMD and the Southern California Association of Governments (SCAG) are the agencies responsible for preparing the Air Quality Management Plan (AQMP) for the Basin pursuant to the federal Clean Air Act in order to reduce emissions of criteria pollutants for which the Basin is in nonattainment. The SCAQMD's adopted 2012 AQMP establishes a program of rules and regulations directed at reducing air pollutant emissions and achieving state (California) and national air quality standards. The 2012 AQMP is a regional and multi-agency effort including the SCAQMD, CARB, SCAG, and the EPA. The 2012 AQMP pollutant control strategies are based on the latest scientific and technical information and planning assumptions, including the 2012 Regional Transportation Plan/Sustainable Communities Strategy, updated emission inventory methodologies for various source categories, and SCAG's latest growth forecasts (SCAQMD 2013). (SCAG's latest growth forecasts were defined in consultation with local governments and with reference to local general plans.)

The AQMP provides local guidance for the State Implementation Plan (SIP), which establishes the framework for air quality basins to achieve attainment of the state and federal ambient air quality standards. Areas that meet ambient air quality standards are classified as attainment areas, while areas that do not meet these standards are classified as nonattainment areas. Areas for which there is insufficient data available are designated unclassified. The attainment status for the western region of Los Angeles County is included in Table 2-4, *Federal and State Ambient Air Quality Attainment Status for Western Los Angeles County*. The region is in nonattainment for state ozone, PM_{10}, and $PM_{2.5}$ standards and nonattainment for federal ozone and $PM_{2.5}$ standards.

TABLE 2-4: FEDERAL AND STATE AMBIENT AIR QUALITY ATTAINMENT STATUS FOR WESTERN LOS ANGELES COUNTY

Pollutant	Federal	State
8-Hour Ozone (O_3)	Nonattainment	Nonattainment
Coarse Particulate Matter (PM_{10})	Attainment	Nonattainment
Fine Particulate Matter ($PM_{2.5}$)	Nonattainment	Nonattainment
Carbon Monoxide (CO)	Unclassified/Attainment	Attainment
Nitrogen Dioxide (NO_2)	Unclassified/Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment

Source: CARB 2015c

Toxic Air Contaminant Regulations

In 1983, the California legislature enacted a program to identify the health effects of TACs and to reduce exposure to these contaminants to protect the public health. The Health and Safety Code defines a TAC as "an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health." A substance that is listed as a hazardous air pollutant pursuant to subsection (b) of Section 112 of the federal Clean Air Act (42 United States Code Section 7412[b]) is a TAC. Under state law, the California Environmental Protection Agency, acting through CARB, is authorized to identify a substance as a TAC if it determines the substance is an air pollutant that may cause or contribute to an increase in mortality or to an increase in serious illness, or may pose a present or potential hazard to human health.

California regulates TACs primarily through Assembly Bill (AB) 1807 (Tanner Air Toxics Act) and AB 2588 (Air Toxics "Hot Spot" Information and Assessment Act of 1987). The Tanner Air Toxics Act sets forth a formal procedure for CARB to designate substances as toxic air contaminants. Once a TAC is identified, CARB adopts an "airborne toxics control measure" for sources that emit designated TACs. If there is a safe threshold for a substance (a point below which there is no toxic effect), the control measure must reduce exposure to below that threshold. If there is no safe threshold, the measure must incorporate toxics best available control technology to minimize emissions. To date, CARB has established formal control measures for eleven TACs, all of which are identified as having no safe threshold.

Air toxics from stationary sources are also regulated in California under the Air Toxics "Hot Spot" Information and Assessment Act of 1987. Under AB 2588, TAC emissions from individual facilities are quantified and prioritized by the air quality management district or air pollution control district. High-priority facilities are required to perform a health risk assessment and, if specific thresholds are exceeded, are required to communicate the results to the public in the form of notices and public meetings.

Since the last update to the TAC list in December 1999, CARB has designated 244 compounds as toxic air contaminants (CARB 1999). Additionally, CARB has implemented control measures for a number of compounds that pose high risks and show potential for effective control. The majority of the estimated health risks from TACs can be attributed to relatively few compounds, the most important being particulate matter from diesel-fueled engines.

California Diesel Risk Reduction Plan

In September 2000, CARB adopted the Diesel Risk Reduction Plan (DRRP), which recommends many control measures to reduce the risks associated with DPM and achieve a goal of an 85 percent reduction of DPM generated by 2020. The DRRP incorporates measures to reduce emissions from diesel-fueled vehicles and stationary diesel-fueled engines. CARB's ongoing efforts to reduce diesel-exhaust emissions from these sources include the development of specific statewide regulations, which are designed to further reduce DPM emissions. The goal of each regulation is to make diesel engines as clean as possible by establishing state-of-the-art technology requirements or emission standards to reduce DPM emissions.

Since the initial adoption of the DRRP in September 2000, CARB has adopted numerous rules related to the reduction of diesel particulate matter from mobile sources, as well as the use of cleaner-burning fuels. Transportation sources addressed by these rules include public transit buses, school buses, on-road heavy-duty trucks, and off-road heavy-duty equipment.

On-Road Heavy-Duty Diesel Vehicles (In Use) Regulation

CARB's On-Road Heavy-Duty Diesel Vehicles (In Use) Regulation requires diesel trucks and buses that operate in California to be upgraded to reduce emissions. Heavier trucks were required to be retrofitted with particulate matter filters beginning January 1, 2012, and older trucks were required to be replaced starting January 1, 2015. By January 1, 2023, nearly all trucks and buses will need to have 2010 model year engines or equivalent. The regulation applies to nearly all privately and federally owned diesel-fueled trucks and buses, as well as to privately and publicly owned school buses with a gross vehicle weight rating greater than 14,000 pounds.

Local

<u>*South Coast Air Quality Management District*</u>

The SCAQMD is the air pollution control agency for Orange County and the urban portions of Los Angeles, Riverside, and San Bernardino counties. The agency's primary responsibility is ensuring that the federal and state ambient air quality standards are attained and maintained in the South Coast Air Basin. The SCAQMD is also responsible for adopting and enforcing rules and regulations concerning air pollutant sources, issuing permits for stationary sources of air pollutants, inspecting stationary sources of air pollutants, responding to citizen complaints, monitoring ambient air quality and meteorological conditions, awarding grants to reduce motor vehicle emissions, and conducting public education campaigns, as well as many other activities. All projects are subject to SCAQMD rules and regulations in effect at the time of construction.

The following is a list of noteworthy SCAQMD rules that are required of the proposed project during construction activities:

- **Rule 402 (Nuisance).** This rule prohibits the discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property. The rule does not apply to odors emanating from agricultural operations necessary for the growing of crops or the raising of fowl or animals.

- **Rule 403 (Fugitive Dust).** This rule requires fugitive dust sources to implement Best Available Control Measures for all sources, and all forms of visible particulate matter are prohibited from crossing any property line. Rule 403 is intended to reduce PM_{10} emissions from any transportation, handling, construction, or storage activity that has the potential to generate fugitive dust. Examples of some PM_{10} suppression techniques are summarized below.

    a. Portions of the construction site to remain inactive longer than a period of three months will be seeded and watered until grass cover is grown or otherwise stabilized in a manner acceptable to the City.

    b. All on-site roads will be paved as soon as feasible or watered periodically or chemically stabilized.

c. All material transported off-site will be either sufficiently watered or securely covered to prevent excessive amounts of dust.

d. The area disturbed by clearing, grading, earth moving, or excavation operations will be minimized at all times.

e. Where vehicles leave the construction site and enter adjacent public streets, the streets will be swept daily or washed down at the end of the work day to remove soil tracked onto the paved surface.

f. A wheel washing system will be installed and used to remove bulk material from tires and vehicle undercarriages before vehicles exit the site.

g. Water will be applied to active portions of the site, including unpaved roads, in sufficient quantity.

- **Rule 1113 (Architectural Coatings).** This rule requires manufacturers, distributors, and end-users of architectural and industrial maintenance coatings to reduce ROG emissions from the use of these coatings, primarily by placing limits on the ROG content of various coating categories.

2.3 IMPACT ASSESSMENT

The impact analysis below is based on guidance from the SCAQMD, the applicable air quality control agency for the Basin. According to the SCAQMD, an air quality impact is considered significant if a proposed project would violate any ambient air quality standard, contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations.

Methodology

The proposed project's criteria air pollutant emissions were calculated using the California Emissions Estimator Model (CalEEMod), version 2016.3.1 computer program (refer to Appendix A). CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for the use of government agencies, land use planners, and environmental professionals. This model was developed in coordination with the SCAQMD and is the most current emissions model approved for use in California by various other air districts. Emissions modeling is based on project-specific data (e.g., size and type of proposed use) and vehicle trip information from the project's traffic impact analysis (refer to Appendix B, *Traffic Impact Study*).

Thresholds of Significance

The following thresholds of significance are based, in part, on CEQA Guidelines Appendix G. For purposes of this analysis, the proposed project may have a significant adverse impact related to land use if it would do any of the following:

- Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
- Conflict with or obstruct implementation of any applicable air quality plan.
- Expose sensitive receptors to substantial pollutant concentrations.
- Create objectionable odors affecting a substantial number of people.
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

The significance criteria established by the applicable air quality management or air pollution control district (SCAQMD) may be relied upon to make the above determinations. According to the SCAQMD, an air quality impact is considered significant if a proposed project would violate any ambient air quality standard, contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations. The SCAQMD has established thresholds of significance for air quality for construction and operational activities of land use developments, which are applicable to the proposed project, as shown in Table 2-5, *SCAQMD Regional Significance Thresholds*.

TABLE 2-5: SCAQMD REGIONAL SIGNIFICANCE THRESHOLDS

Air Pollutant	Construction Activities	Operations
Reactive Organic Gases (ROG)	75 pounds/day	55 pounds/day
Carbon Monoxide (CO)	550 pounds/day	550 pounds/day
Nitrogen Oxides (NOx)	100 pounds/day	55 pounds/day
Sulfur Oxides (SOx)	150 pounds/day	150 pounds/day
Coarse Particulates (PM10)	150 pounds/day	150 pounds/day
Fine Particulates (PM2.5)	55 pounds/day	55 pounds/day

Source: SCAQMD 1993 ($PM_{2.5}$ threshold adopted June 1, 2007)

Carbon Monoxide Hot-Spot Analysis

In addition to the daily thresholds listed above, the proposed project would be subject to the ambient air quality standards. These standards are addressed though an analysis of localized carbon monoxide impacts. The California 1-hour and 8-hour CO standards are:

- 1-hour = 20 parts per million
- 8-hour = 9 parts per million

The significance of localized impacts depends on whether ambient CO levels in the vicinity of a project are above state and federal CO standards. CO concentrations in Los Angeles County do not exceed the California or national ambient air quality standards criteria, and the Basin has been designated as attainment under the 1-hour and 8-hour standards.

Localized Significance Thresholds

In addition to the CO hot-spot analysis, the SCAQMD developed localized significance thresholds (LSTs) for emissions of NO_2, CO, PM_{10}, and $PM_{2.5}$ generated at new development sites (off-site mobile source emissions are not included in the LST analysis). LST screening thresholds represent the maximum emissions at a project site that are not expected to cause or contribute to an exceedance of the most stringent national or state ambient air quality standard. LST screening thresholds are based on the ambient concentrations of that pollutant within the project source receptor area (SRA), as demarcated by the SCAQMD, and the distance to the nearest sensitive receptor. The project site is located in SCAQMD SRA 13. Table 2-6, *Local Significance Threshold (LST) Analysis Screening Thresholds – Pounds per Day*, shows the screening thresholds for a 1-acre, 2-acre, and 5-acre project site in SRA 13 with sensitive receptors located within 200 meters of a project site.

TABLE 2-6: LOCAL SIGNIFICANCE THRESHOLD (LST) ANALYSIS SCREENING THRESHOLDS – POUNDS PER DAY

Project Size	NOx	CO	PM_{10}	$PM_{2.5}$
1 Acre (construction/operations)	161 / 161	2,500 / 2,500	51 / 13	18 / 5
2 Acres (construction/operations)	190 / 190	3,108 / 3,108	59 / 15	20 / 5
5 Acres (construction/operations)	256 / 256	4,608 / 4,608	79 / 19	26 / 7

Source: SCAQMD 2009

Toxic Air Contaminant Thresholds

The SCAQMD regulates levels of air toxics through a permitting process that covers both construction and operation. The SCAQMD has adopted Rule 1401 for both new and modified sources that use materials classified as air toxics. The SCAQMD CEQA Guidelines for permit processing consider the following types of projects significant:

- Any project involving the emission of a carcinogenic or TAC identified in SCAQMD Rule 1401 that exceeds the maximum individual cancer risk of 1 in 1 million or 10 in 1 million if the project is constructed with best available control strategy for toxics using the procedures in SCAQMD Rule 1401.

- Any project that could accidentally release an acutely hazardous material or routinely release a TAC, posing an acute health hazard.

- Any project that could emit an air contaminant not currently regulated by SCAQMD rule but that is on the federal or state air toxics list.

Based on these significance thresholds and criteria, the project's effects have been categorized as either "no impact," a "less than significant impact," or a "potentially significant impact." Mitigation measures are recommended for potentially significant impacts. If a potentially significant impact cannot be reduced to a less than significant level through the application of mitigation, it is categorized as a significant and unavoidable impact.

Impact Assessment

Violate Any Air Quality Standards or Contribute Substantially to an Existing or Projected Air Quality Violation During Project Construction

Construction associated with the project would generate short-term emissions of criteria air pollutants. The criteria pollutants of primary concern in the project area include ozone-precursor pollutants (i.e., ROG and NO_x) and PM_{10}. Construction-generated emissions are short term and of temporary duration, lasting only as long as construction activities occur, but have the potential to represent a significant air quality impact.

Construction results in the temporary generation of emissions ensuing from site grading and excavation, road paving, motor vehicle exhaust associated with construction equipment and worker trips, and the movement of construction equipment, especially on unpaved surfaces. Emissions of airborne particulate matter are largely dependent on the amount of ground disturbance associated with site preparation activities as well as weather conditions and the appropriate application of water. Construction-related emissions are expected from site preparation, grading, building construction, paving, architectural coatings, and construction workers commuting. Architectural coatings (i.e., painting) would occur sporadically throughout the building phase, as needed.

The estimate for construction duration is based on CalEEMod model defaults, as are the number and types of equipment that would be used. Please refer to specific detailed modeling inputs/outputs, including construction equipment assumptions, contained in Appendix A.

Construction-Related Regional Air Quality Impacts

The estimated maximum daily construction emissions are summarized in Table 2-7, *Construction-Related Emissions*. As previously stated, all construction projects in the South Coast Air Basin are subject to SCAQMD rules and regulations in effect at the time of construction, including Rule 403 described above. The construction emissions summarized in Table 2-7 account for the quantifiable PM-reducing requirements of SCAQMD Rule 403.

TABLE 2-7: CONSTRUCTION-RELATED EMISSIONS

Construction Activities	Maximum Emissions (pounds per day)					
	Reactive Organic Gases (ROG)	Nitrogen Oxide (NO_X)	Coarse Particulate Matter (PM_{10})	Fine Particulate Matter ($PM_{2.5}$)	Carbon Monoxide (CO)	Sulfur Dioxide (SO_2)
Year 1 (2017)	24.32	57.77	9.92	6.48	52.43	0.11
Year 2 (2018)	23.35	51.09	4.94	3.08	49.25	0.10
SCAQMD Thresholds	*75*	*100*	*150*	*55*	*550*	*150*
Exceed Threshold?	No	No	No	No	No	No

Notes: Emissions calculated using CalEEMod version 2016.3.1. Emission estimates account for the quantifiable PM-reducing requirements of SCAQMD Rule 403, including watering exposed surfaces three times daily; cleaning trackout on adjacent streets, covering stockpiles with tarps; watering all haul roads twice daily; and limiting speeds on unpaved roads to 15 miles per hour. Building construction, paving, and architectural coating assumed to occur simultaneously. Refer to Appendix A for daily emission model outputs.

As shown in Table 2-7, emissions resulting from project construction will not exceed any applicable thresholds. Construction-related regional air quality impacts are considered less than significant.

Construction-Related Localized Air Quality Impacts

Localized significance thresholds were developed in response to the SCAQMD Governing Board's Environmental Justice Enhancement Initiative (I-4). The SCAQMD provided the Final Localized Significance Threshold Methodology (dated June 2003 [revised 2009]) for guidance. The LST methodology assists lead agencies in analyzing localized air quality impacts.

For this project, the appropriate source receptor area (SRA) for the localized significance thresholds is the Santa Clarita Valley area (SRA 13) since this area includes the project site. LSTs apply to CO, NO_2, PM_{10}, and $PM_{2.5}$. The SCAQMD-produced look-up tables provide screening thresholds for projects that disturb 1 acre, 2 acres, and 5 acres, so 4.3 acres (size of the project site) was interpolated.

The SCAQMD's methodology clearly states that "off-site mobile emissions from the project should not be included in the emissions compared to LSTs." Therefore, for purposes of the construction LST analysis, only emissions included in the CalEEMod "on-site" emissions outputs were considered. The nearest existing sensitive receptors to the development boundaries are the residences located 400 meters from the proposed project site. Therefore, to be conservative, LST screening thresholds for receptors at 200 meters were used in this analysis.

Table 2-8, *Localized Significance of Emissions – Pounds per Day*, presents the results of localized emissions during construction activity. The LST screening thresholds have been adjusted to reflect a maximum disturbance of 4.3 acres for the proposed project.

TABLE 2-8: LOCALIZED SIGNIFICANCE OF EMISSIONS – POUNDS PER DAY

Activity	Nitrogen Oxide (NO_X)	Coarse Particulate Matter (PM_{10})	Fine Particulate Matter ($PM_{2.5}$)	Carbon Monoxide (CO)
Demolition (2017)	42.75	5.47	2.54	23.01
Site Preparation (2017)	52.28	9.79	6.45	23.46
Grading (2017)	33.89	4.28	2.92	17.10
Building Construction, Paving, and Architectural Coating (2017)	45.78	2.98	2.79	32.72
Building Construction, Paving, and Architectural Coating (2018)	39.92	2.49	2.33	31.86
Maximum Daily On-Site Emissions	**52.28**	**9.79**	**6.45**	**32.72**
SCAQMD Localized Screening Threshold (adjusted for 4.3 acres of disturbance)	240.6	74.3	24.6	4258
Significant?	**No**	**No**	**No**	**No**

Source: CalEEMod version 2016.3.1.

Notes: Emissions projections account for adherence to various components of SCAQMD Rule 403, including application of water on the project site, employment of wheel washing systems, replacement of ground cover in disturbed areas, sweeping adjacent streets daily, and reestablishing vegetation on inactive portions of the site. Building construction, paving, and architectural coating assumed to occur simultaneously.

As shown in Table 2-8, air pollutant emissions resulting from project construction would not exceed the applicable LST screening thresholds; therefore, this impact is less than significant.

Mitigation Measures: No mitigation measures are required.

Level of Significance: Less than significant impact.

Violate Any Air Quality Standards or Contribute Substantially to an Existing or Projected Air Quality Violation During Project Operation

Operational activities associated with the proposed project will result in emissions of ROG, NO_x, CO, sulfur oxides (SO_X), PM_{10}, and $PM_{2.5}$. Operational emissions would be expected from the following primary sources: vehicles, combustion of natural gas and electricity, landscape maintenance equipment, consumer products, and architectural coatings.

Operations-Related Regional Air Quality Impacts

The project's operations-related regional emissions burdens (as calculated with the CalEEMod program), along with a comparison of SCAQMD-recommended significance thresholds, are shown in Table 2-9, *Long-Term Operational Emissions*.

TABLE 2-9: LONG-TERM OPERATIONAL EMISSIONS

Source	Pollutant (pounds/day)					
	Reactive Organic Gases (ROG)	Nitrogen Oxide (NO_X)	Coarse Particulate Matter (PM_{10})	Fine Particulate Matter ($PM_{2.5}$)	Carbon Monoxide (CO)	Sulfur Dioxide (SO_2)
Summer Emissions						
Area Source	9.44	0.00	0.00	0.00	0.05	0.00
Energy Use	0.30	2.72	0.21	0.21	2.29	0.02
Mobile Source	5.40	22.44	7.41	2.24	64.41	0.17
Total	15.15	25.16	7.62	2.45	66.75	0.19
Potentially Significant Impact Threshold (Daily Emissions)	*55*	*55*	*550*	*150*	*150*	*55*
Exceed Daily Threshold?	No	No	No	No	No	No
Winter Emissions						
Area Source	9.44	0.00	0.00	0.00	0.05	0.00
Energy Use	0.30	2.72	0.21	0.21	2.29	0.02
Mobile Source	5.28	23.01	7.41	2.24	62.29	0.17
Total	15.03	25.73	7.62	2.45	64.62	0.18
Potentially Significant Impact Threshold (Daily Emissions)	*55*	*55*	*550*	*150*	*150*	*55*
Exceed Daily Threshold?	No	No	No	No	No	No

Notes: Emissions calculated using CalEEMod version 2016.3.1.

Refer to Appendix A for daily emission model outputs.

As shown in Table 2-9, emissions resulting from project operations would not exceed the SCAQMD regional emissions thresholds for operational activity. Therefore, this impact is less than significant.

Operations-Related Localized Air Quality Impacts

According to the SCAQMD methodology, LSTs apply to the operational phase of a proposed project if the project includes stationary sources or attracts mobile sources that may spend long periods queuing and idling at the site (e.g., warehouse or transfer facilities). Since the proposed project does not include these types of sources, an analysis of operational LSTs is not required.

Level of Significance: Less than significant impact.

Mitigation Measures: No mitigation measures are required.

Conflict with or Obstruct Implementation of the Applicable Air Quality Plan

As part of its enforcement responsibilities, the EPA requires each state with nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the federal standards. The SIP must integrate federal, state, and local plan components and regulations to identify specific measures to reduce pollution in nonattainment areas, using a combination of performance standards and market-based programs. Similarly, under state law, the California Clean Air Act requires an air quality attainment plan to be prepared for areas designated as nonattainment with regard to the federal and state ambient air quality standards. Air quality attainment plans outline emissions limits and control measures to achieve and maintain these standards by the earliest practical date.

As previously mentioned, the project site is located in the South Coast Air Basin, which is under the jurisdiction of the SCAQMD. The SCAQMD is required, pursuant to the federal Clean Air Act, to reduce emissions of criteria pollutants for which the air basin is in nonattainment. In order to reduce such emissions, the SCAQMD drafted an Air Quality Management Plan (AQMP). There is currently a draft 2016 AQMP, but it has not yet been adopted (as of November 2016). Therefore, the project will be analyzed against the adopted 2012 AQMP. The 2012 AQMP establishes a program of rules and regulations directed at reducing air pollutant emissions and achieving state (California) and national air quality standards. The pollutant control strategies in the 2012 AQMP are based on the latest scientific and technical information and planning assumptions, including the 2016 Regional Transportation Plan/Sustainable Communities Strategy, updated emission inventory methodologies for various source categories, and SCAG's latest growth forecasts (SCAQMD 2013). (SCAG's latest growth forecasts were defined in consultation with local governments and with reference to local general plans.)

Criteria for determining consistency with the AQMP are defined by the following indicators:

- Consistency Criterion No. 1: The proposed project will not result in an increase in the frequency or severity of existing air quality violations, or cause or contribute to new violations, or delay the timely attainment of air quality standards or the interim emissions reductions specified in the AQMP.

- Consistency Criterion No. 2: The proposed project will not exceed the assumptions in the AQMP or increments based on the years of the project buildout phase.

The violations to which Consistency Criterion No. 1 refer are the California ambient air quality standards (CAAQS) and the national ambient air quality standards (NAAQS). As evaluated above, the project would not exceed the SCAQMD short-term construction thresholds or SCAQMD long-term operational thresholds. The project would not result in an increase in the frequency or severity of existing air quality violations, or cause or contribute to new violations, or delay the timely attainment of air quality standards. Thus, a less than significant impact is expected, and the project would be consistent with the first criterion.

Concerning Consistency Criterion No. 2, the AQMP contains air pollutant reduction strategies and demonstrates that the applicable ambient air quality standards can be achieved within the time frames required under federal law. Growth projections from local general plans adopted by cities in the district are provided to SCAG, which develops regional growth forecasts that are used to develop future air quality forecasts for the AQMP. Development consistent with the growth projections in the City of Santa Clarita General Plan is considered to be consistent with the AQMP. The proposed project is consistent with the land use designation and development density specified in the General Plan and therefore would not exceed the population or job growth projections used by the SCAQMD to develop the Air Quality Management Plan. Thus, no impact would occur, as the project is consistent with both criteria.

Mitigation Measures: No mitigation measures are required.

Level of Significance: Less than significant impact.

Expose Sensitive Receptors to Substantial Pollutant Concentrations

Sensitive receptors are defined as facilities or land uses that include members of the population who are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of these sensitive receptors are residences, schools, hospitals, and daycare centers. The California Air Resources Board (CARB) has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over 65, children under 14, athletes, and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis. As previously stated, the nearest sensitive receptors are the residences approximately 400 meters southwest of the project site, across I-5.

Construction-Generated Air Toxics

Construction-generated diesel PM emissions contribute to negative health impacts when construction is extended over lengthy periods of time. The use of diesel-powered equipment during construction would be temporary and episodic and would occur over several locations isolated from one another. Furthermore, the proposed project would be subject to and would comply with California regulations limiting vehicle idling to no more than 5 minutes, which would further reduce nearby sensitive receptors' exposure to temporary and variable diesel particulate matter emissions. Project construction would not be a substantial source of other CARB-identified TACs.

Construction projects on a site of less than 5 acres are generally considered to represent less than significant health risk impacts due to (1) limitations on the off-road diesel equipment able to operate and thus a reduced amount of generated DPM, (2) the reduced amount of dust-generating ground disturbance possible compared to larger construction sites, and (3) the reduced duration of construction activities compared to the development of larger sites. For these reasons and because diesel fumes disperse rapidly over relatively short distances, DPM generated by most construction activities, in and of itself, would not be expected to create conditions where the probability of contracting cancer is greater than 10 in 1 million for nearby receptors. Since the project site is 4.3 acres, a less than significant impact is expected.

In addition, SCAQMD Rule 403 requires that basic construction mitigation measures are employed during all construction projects, including measures that would substantially reduce nuisance fugitive dust.

Furthermore, as discussed in the LST analysis previously presented, results indicate that the proposed project would not exceed the SCAQMD localized significance thresholds, and a less than significant impact is expected during construction activity. LSTs were developed in response to environmental justice and health concerns raised by the public regarding exposure of individuals to criteria pollutants in local communities. Therefore, sensitive receptors would not be subject to a significant air quality impact during project construction. This impact is less than significant.

Carbon Monoxide Hot Spots

CO emissions are a function of vehicle idling time, meteorological conditions, and traffic flow. Under certain extreme meteorological conditions, CO concentrations near a congested roadway or intersection may reach unhealthful levels (i.e., adversely affecting residents, schoolchildren, hospital patients, the elderly, etc.).

The Basin is designated as an unclassified/attainment area for the federal CO standards and an attainment area for state standards. There has been a decline in CO emissions even though vehicle miles traveled on urban and rural roads in the United States have increased. On-road mobile source CO emissions declined 24 percent between 1989 and 1998, despite a 23 percent rise in motor vehicle miles traveled over the same 10 years. California trends have been consistent with national trends; CO emissions declined 20 percent in California from 1985 through 1997, while vehicle miles traveled increased 18 percent in the 1990s. Three major control programs have contributed to the reduced per-vehicle CO emissions: exhaust standards, cleaner-burning fuels, and motor vehicle inspection/maintenance programs.

A detailed CO analysis was conducted in the Federal Attainment Plan for Carbon Monoxide (CO Plan) for the SCAQMD's 2003 Air Quality Management Plan. The locations selected for microscale modeling in the CO Plan are worst-case intersections in the Basin and would likely experience the highest CO concentrations. Thus, the CO analysis in the CO Plan is used in a comparison to the proposed project, since it represents a worst-case scenario with heavy traffic volumes within the Basin.

Of the studied locations, the Wilshire Boulevard/Veteran Avenue intersection in Los Angeles experienced the highest CO concentration (4.6 parts per million [ppm]), which is well below the 35-ppm 1-hour CO federal standard. The Wilshire Boulevard/Veteran Avenue intersection is one of the most congested intersections in Southern California with an average daily traffic (ADT) volume of approximately 100,000 vehicles per day. Because CO hot spots were not experienced at the Wilshire Boulevard/Veteran Avenue intersection, it can be reasonably inferred that CO hot spots would not be experienced at any intersections near the project site due to the addition of approximately 1,237 daily trips that would occur as a result of project implementation. Therefore, impacts would be less than significant in this regard.

Mitigation Measures: No mitigation measures are required.

Level of Significance: Less than significant impact.

Create Objectionable Odors Affecting a Substantial Number of People

Typically, odors are regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another. It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

Construction activities associated with the project may generate detectable odors from heavy-duty equipment exhaust. Construction-related odors would be short-term in nature and cease upon project completion. Additionally, construction-related odors dissipate rapidly, as the nature of construction necessitates the need to move equipment around the construction site throughout a workday. Any construction-related impacts to existing adjacent land uses would be short term and are less than significant.

In terms of operational activities, the SCAQMD (1993) CEQA Air Quality Handbook identifies land uses associated with odor complaints. These include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The proposed project does not include any uses identified by the SCAQMD as being associated with odors. Any operational-related impacts to existing adjacent land uses would be less than significant.

Mitigation Measures: No mitigation measures are required.

Level of Significance: Less than significant impact.

Result in a Cumulatively Considerable Net Increase of any Criteria Pollutant for Which the Project Region is Nonattainment Under an Applicable Federal or State Ambient Air Quality Standard (Including Releasing Emissions Which Exceed Quantitative Thresholds for Ozone Precursors)

Projects could contribute to an existing or projected air quality exceedance because the western region of Los Angeles County is currently in nonattainment for state ozone, PM_{10}, and $PM_{2.5}$ standards and nonattainment for federal ozone and $PM_{2.5}$ standards. With regard to determining the significance of the cumulative contribution from the project, the SCAQMD recommends that any given project's potential contribution to cumulative impacts be assessed using the same significance criteria as for project-specific impacts. Individual projects that do not generate operational or construction emissions exceeding the SCAQMD's daily thresholds for project-specific impacts would also not cause a cumulatively considerable increase in emissions for those pollutants for which the air basin is in nonattainment, and therefore would not be considered to have a significant, adverse air quality impact. Alternatively, individual project-related construction and operational emissions that exceed SCAQMD thresholds for project-specific impacts would be considered cumulatively considerable. As previously noted, the project will not exceed the applicable SCAQMD regional thresholds for construction and operational-source emissions. As such, the project will result in a less than cumulatively considerable impact.

Mitigation Measures: No mitigation measures are required.

Level of Significance: Less than cumulatively considerable impact.

References

CAPCOA (California Air Pollution Control Officers Association). 2013. *Health Effects*. Accessed October 2016. www.capcoa.org/health-effects/.

CARB (California Air Resources Board). 1999. *Final Staff Report: Update to the Toxic Air Contaminant List.*

———. 2015a. Aerometric Data Analysis and Management System (ADAM) Air Quality Data Statistics. Accessed October 2016. http://www.arb.ca.gov/adam/index.html.

———. 2015b. Ambient Air Quality Standards. Accessed October 2016. http://www.arb.ca.gov/research/aaqs/aaqs2.pdf.

———. 2015c. State and Federal Area Designation Maps. Accessed October 2016. http://www.arb.ca.gov/desig/adm/adm.htm.

EPA (US Environmental Protection Agency). 2002. Health Assessment Document for Diesel Engine Exhaust. http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=29060.

OEHHA (Office of Environmental Health Hazard Assessment). 2007. Air Toxicology and Epidemiology: Air Pollution and Children's Health. http://oehha.ca.gov/public_info/facts/airkids.html.

SCAQMD (South Coast Air Quality Management District). 1993. *CEQA Air Quality Handbook.*

———. 2009. Localized Significance Threshold Appendix C – Mass Rate LST Look-up Tables. www.aqmd.gov/ceqa/handbook/LST/LST.html.

———. 2013. *Final 2012 Air Quality Management Plan.*

APPENDICES

APPENDIX A
CRITERIA AIR POLLUTANT MODELING OUTPUTS

Wayne Mills Place Project

Los Angeles-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Hotel	108.00	Room	1.30	156,816.00	0
Hotel	182.00	Room	2.30	264,264.00	0
Parking Lot	192.00	Space	0.70	76,800.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 33

Climate Zone 9 **Operational Year** 2018

Utility Company Southern California Edison

CO2 Intensity (lb/MWhr) 702.44 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Acreage adjusted per project applicant.

Construction Phase - Construction, paving, and painting assumed to occur simultaneously.

Demolition -

Vehicle Trips - Adjusted rates per traffic report.

Construction Off-road Equipment Mitigation - Per SCAQMD CEQA Handbook.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	40
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	15
tblConstructionPhase	NumDays	18.00	230.00
tblConstructionPhase	NumDays	18.00	230.00
tblConstructionPhase	PhaseEndDate	4/23/2018	3/2/2018
tblConstructionPhase	PhaseEndDate	3/28/2018	3/2/2018
tblConstructionPhase	PhaseStartDate	3/29/2018	4/15/2017
tblConstructionPhase	PhaseStartDate	3/3/2018	4/15/2017
tblLandUse	LotAcreage	3.60	1.30
tblLandUse	LotAcreage	6.07	2.30
tblLandUse	LotAcreage	1.73	0.70
tblVehicleTrips	ST_TR	8.19	4.27
tblVehicleTrips	SU_TR	5.95	4.27
tblVehicleTrips	WD_TR	8.17	4.27

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	24.3185	57.7699	52.4312	0.1057	18.2675	3.0961	21.1479	9.9840	2.9017	12.6341	0.0000	10,644.4330	10,644.4330	1.5554	0.0000	10,683.3187
2018	23.3487	51.0940	49.2517	0.1046	3.5541	2.5852	6.1393	0.9545	2.4249	3.3794	0.0000	10,482.2049	10,482.2049	1.5156	0.0000	10,520.0953
Maximum	**24.3185**	**57.7699**	**52.4312**	**0.1057**	**18.2675**	**3.0961**	**21.1479**	**9.9840**	**2.9017**	**12.6341**	**0.0000**	**10,644.4330**	**10,644.4330**	**1.5554**	**0.0000**	**10,683.3187**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	24.3185	57.7699	52.4312	0.1057	7.0416	3.0961	9.9220	3.8347	2.9017	6.4847	0.0000	10,644.4330	10,644.4330	1.5554	0.0000	10,683.3187
2018	23.3487	51.0940	49.2517	0.1046	2.3511	2.5852	4.9363	0.6592	2.4249	3.0841	0.0000	10,482.2049	10,482.2049	1.5156	0.0000	10,520.0953
Maximum	**24.3185**	**57.7699**	**52.4312**	**0.1057**	**7.0416**	**3.0961**	**9.9220**	**3.8347**	**2.9017**	**6.4847**	**0.0000**	**10,644.4330**	**10,644.4330**	**1.5554**	**0.0000**	**10,683.3187**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**56.96**	**0.00**	**45.55**	**58.92**	**0.00**	**40.25**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	9.4446	4.7000e-004	0.0499	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004		0.1055	0.1055	2.9000e-004		0.1127
Energy	0.2996	2.7235	2.2877	0.0163		0.2070	0.2070		0.2070	0.2070		3,268.2051	3,268.2051	0.0626	0.0599	3,287.6264
Mobile	5.4037	22.4374	64.4136	0.1749	7.2023	0.2070	7.4092	2.0473	0.1947	2.2420		17,733.7558	17,733.7558	1.1077		17,761.4482
Total	**15.1479**	**25.1614**	**66.7512**	**0.1912**	**7.2023**	**0.4142**	**7.6164**	**2.0473**	**0.4019**	**2.4492**		**21,002.0664**	**21,002.0664**	**1.1706**	**0.0599**	**21,049.1873**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	9.4446	4.7000e-004	0.0499	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004		0.1055	0.1055	2.9000e-004		0.1127
Energy	0.2996	2.7235	2.2877	0.0163		0.2070	0.2070		0.2070	0.2070		3,268.2051	3,268.2051	0.0626	0.0599	3,287.6264
Mobile	5.4037	22.4374	64.4136	0.1749	7.2023	0.2070	7.4092	2.0473	0.1947	2.2420		17,733.7558	17,733.7558	1.1077		17,761.4482
Total	**15.1479**	**25.1614**	**66.7512**	**0.1912**	**7.2023**	**0.4142**	**7.6164**	**2.0473**	**0.4019**	**2.4492**		**21,002.0664**	**21,002.0664**	**1.1706**	**0.0599**	**21,049.1873**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	3/1/2017	3/28/2017	5	20	
2	Site Preparation	Site Preparation	3/29/2017	4/4/2017	5	5	
3	Grading	Grading	4/5/2017	4/14/2017	5	8	
4	Building Construction	Building Construction	4/15/2017	3/2/2018	5	230	
5	Paving	Paving	4/15/2017	3/2/2018	5	230	
6	Architectural Coating	Architectural Coating	4/15/2017	3/2/2018	5	230	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4

Acres of Paving: 0.7

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 631,620; Non-Residential Outdoor: 210,540; Striped Parking Area: 4,608 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Grading	Excavators	1	8.00	158	0.38
Paving	Pavers	1	8.00	130	0.42
Paving	Rollers	2	6.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Paving	Paving Equipment	2	6.00	132	0.36
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	1	42.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	209.00	82.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	6	15.00	0.00	793.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Demolition - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.5757	0.0000	8.5757	1.2984	0.0000	1.2984			0.0000			0.0000
Off-Road	4.1031	42.7475	23.0122	0.0388		2.1935	2.1935		2.0425	2.0425		3,924.2833	3,924.2833	1.0730		3,951.1070
Total	**4.1031**	**42.7475**	**23.0122**	**0.0388**	**8.5757**	**2.1935**	**10.7692**	**1.2984**	**2.0425**	**3.3410**		**3,924.2833**	**3,924.2833**	**1.0730**		**3,951.1070**

3.2 Demolition - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.4476	13.7825	2.8148	0.0325	0.6932	0.0728	0.7660	0.1900	0.0696	0.2597		3,500.463 6	3,500.463 6	0.2446		3,506.577 6
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0938	0.0720	0.9234	1.9500e-003	0.1677	1.5600e-003	0.1692	0.0445	1.4400e-003	0.0459		193.3376	193.3376	8.0300e-003		193.5383
Total	**0.5414**	**13.8544**	**3.7382**	**0.0344**	**0.8608**	**0.0744**	**0.9352**	**0.2345**	**0.0711**	**0.3056**		**3,693.801 2**	**3,693.801 2**	**0.2526**		**3,700.115 9**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.2802	0.0000	3.2802	0.4967	0.0000	0.4967			0.0000			0.0000
Off-Road	4.1031	42.7475	23.0122	0.0388		2.1935	2.1935		2.0425	2.0425	0.0000	3,924.283 3	3,924.283 3	1.0730		3,951.107 0
Total	**4.1031**	**42.7475**	**23.0122**	**0.0388**	**3.2802**	**2.1935**	**5.4737**	**0.4967**	**2.0425**	**2.5392**	**0.0000**	**3,924.283 3**	**3,924.283 3**	**1.0730**		**3,951.107 0**

3.2 Demolition - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.4476	13.7825	2.8148	0.0325	0.4835	0.0728	0.5563	0.1385	0.0696	0.2082		3,500.463 6	3,500.463 6	0.2446		3,506.577 6
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0938	0.0720	0.9234	1.9500e-003	0.1094	1.5600e-003	0.1109	0.0302	1.4400e-003	0.0316		193.3376	193.3376	8.0300e-003		193.5383
Total	**0.5414**	**13.8544**	**3.7382**	**0.0344**	**0.5929**	**0.0744**	**0.6672**	**0.1687**	**0.0711**	**0.2398**		**3,693.801 2**	**3,693.801 2**	**0.2526**		**3,700.115 9**

3.3 Site Preparation - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.9608	52.2754	23.4554	0.0380		2.8786	2.8786		2.6483	2.6483		3,894.950 0	3,894.950 0	1.1934		3,924.785 2
Total	**4.9608**	**52.2754**	**23.4554**	**0.0380**	**18.0663**	**2.8786**	**20.9448**	**9.9307**	**2.6483**	**12.5790**		**3,894.950 0**	**3,894.950 0**	**1.1934**		**3,924.785 2**

3.3 Site Preparation - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1126	0.0863	1.1081	2.3300e-003	0.2012	1.8700e-003	0.2031	0.0534	1.7300e-003	0.0551		232.0052	232.0052	9.6300e-003		232.2460
Total	**0.1126**	**0.0863**	**1.1081**	**2.3300e-003**	**0.2012**	**1.8700e-003**	**0.2031**	**0.0534**	**1.7300e-003**	**0.0551**		**232.0052**	**232.0052**	**9.6300e-003**		**232.2460**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.9103	0.0000	6.9103	3.7985	0.0000	3.7985			0.0000			0.0000
Off-Road	4.9608	52.2754	23.4554	0.0380		2.8786	2.8786		2.6483	2.6483	0.0000	3,894.9500	3,894.9500	1.1934		3,924.7852
Total	**4.9608**	**52.2754**	**23.4554**	**0.0380**	**6.9103**	**2.8786**	**9.7889**	**3.7985**	**2.6483**	**6.4468**	**0.0000**	**3,894.9500**	**3,894.9500**	**1.1934**		**3,924.7852**

3.3 Site Preparation - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1126	0.0863	1.1081	2.3300e-003	0.1312	1.8700e-003	0.1331	0.0362	1.7300e-003	0.0379		232.0052	232.0052	9.6300e-003		232.2460
Total	**0.1126**	**0.0863**	**1.1081**	**2.3300e-003**	**0.1312**	**1.8700e-003**	**0.1331**	**0.0362**	**1.7300e-003**	**0.0379**		**232.0052**	**232.0052**	**9.6300e-003**		**232.2460**

3.4 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	3.0705	33.8868	17.1042	0.0297		1.7774	1.7774		1.6352	1.6352		3,037.9107	3,037.9107	0.9308		3,061.1809
Total	**3.0705**	**33.8868**	**17.1042**	**0.0297**	**6.5523**	**1.7774**	**8.3298**	**3.3675**	**1.6352**	**5.0027**		**3,037.9107**	**3,037.9107**	**0.9308**		**3,061.1809**

3.4 Grading - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0938	0.0720	0.9234	1.9500e-003	0.1677	1.5600e-003	0.1692	0.0445	1.4400e-003	0.0459		193.3376	193.3376	8.0300e-003		193.5383
Total	**0.0938**	**0.0720**	**0.9234**	**1.9500e-003**	**0.1677**	**1.5600e-003**	**0.1692**	**0.0445**	**1.4400e-003**	**0.0459**		**193.3376**	**193.3376**	**8.0300e-003**		**193.5383**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.5063	0.0000	2.5063	1.2881	0.0000	1.2881			0.0000			0.0000
Off-Road	3.0705	33.8868	17.1042	0.0297		1.7774	1.7774		1.6352	1.6352	0.0000	3,037.9107	3,037.9107	0.9308		3,061.1809
Total	**3.0705**	**33.8868**	**17.1042**	**0.0297**	**2.5063**	**1.7774**	**4.2837**	**1.2881**	**1.6352**	**2.9233**	**0.0000**	**3,037.9107**	**3,037.9107**	**0.9308**		**3,061.1809**

3.4 Grading - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0938	0.0720	0.9234	1.9500e-003	0.1094	1.5600e-003	0.1109	0.0302	1.4400e-003	0.0316		193.3376	193.3376	8.0300e-003		193.5383
Total	**0.0938**	**0.0720**	**0.9234**	**1.9500e-003**	**0.1094**	**1.5600e-003**	**0.1109**	**0.0302**	**1.4400e-003**	**0.0316**		**193.3376**	**193.3376**	**8.0300e-003**		**193.5383**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.1149	26.5546	18.1825	0.0269		1.7879	1.7879		1.6791	1.6791		2,650.979 7	2,650.979 7	0.6531		2,667.307 8
Total	**3.1149**	**26.5546**	**18.1825**	**0.0269**		**1.7879**	**1.7879**		**1.6791**	**1.6791**		**2,650.979 7**	**2,650.979 7**	**0.6531**		**2,667.307 8**

3.5 Building Construction - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4281	10.6916	3.0420	0.0218	0.5249	0.0896	0.6145	0.1511	0.0857	0.2368		2,317.262 0	2,317.262 0	0.1602		2,321.267 8
Worker	1.3070	1.0024	12.8662	0.0271	2.3361	0.0217	2.3579	0.6196	0.0201	0.6396		2,693.837 7	2,693.837 7	0.1118		2,696.633 6
Total	**1.7350**	**11.6940**	**15.9082**	**0.0489**	**2.8611**	**0.1113**	**2.9723**	**0.7707**	**0.1057**	**0.8764**		**5,011.099 7**	**5,011.099 7**	**0.2721**		**5,017.901 3**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.1149	26.5546	18.1825	0.0269		1.7879	1.7879		1.6791	1.6791	0.0000	2,650.979 7	2,650.979 7	0.6531		2,667.307 8
Total	**3.1149**	**26.5546**	**18.1825**	**0.0269**		**1.7879**	**1.7879**		**1.6791**	**1.6791**	**0.0000**	**2,650.979 7**	**2,650.979 7**	**0.6531**		**2,667.307 8**

3.5 Building Construction - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4281	10.6916	3.0420	0.0218	0.3753	0.0896	0.4649	0.1144	0.0857	0.2001		2,317.2620	2,317.2620	0.1602		2,321.2678
Worker	1.3070	1.0024	12.8662	0.0271	1.5237	0.0217	1.5455	0.4202	0.0201	0.4402		2,693.8377	2,693.8377	0.1118		2,696.6336
Total	**1.7350**	**11.6940**	**15.9082**	**0.0489**	**1.8991**	**0.1113**	**2.0103**	**0.5346**	**0.1057**	**0.6403**		**5,011.0997**	**5,011.0997**	**0.2721**		**5,017.9013**

3.5 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099		2,620.9351	2,620.9351	0.6421		2,636.9883
Total	**2.6795**	**23.3900**	**17.5804**	**0.0269**		**1.4999**	**1.4999**		**1.4099**	**1.4099**		**2,620.9351**	**2,620.9351**	**0.6421**		**2,636.9883**

3.5 Building Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.3772	10.0499	2.7478	0.0217	0.5249	0.0708	0.5958	0.1511	0.0678	0.2189		2,309.7712	2,309.7712	0.1521		2,313.5735
Worker	1.1547	0.8714	11.2876	0.0263	2.3361	0.0208	2.3570	0.6196	0.0192	0.6388		2,620.2118	2,620.2118	0.0983		2,622.6686
Total	**1.5319**	**10.9213**	**14.0353**	**0.0480**	**2.8611**	**0.0917**	**2.9527**	**0.7707**	**0.0870**	**0.8576**		**4,929.9830**	**4,929.9830**	**0.2504**		**4,936.2421**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099	0.0000	2,620.9351	2,620.9351	0.6421		2,636.9883
Total	**2.6795**	**23.3900**	**17.5804**	**0.0269**		**1.4999**	**1.4999**		**1.4099**	**1.4099**	**0.0000**	**2,620.9351**	**2,620.9351**	**0.6421**		**2,636.9883**

3.5 Building Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.3772	10.0499	2.7478	0.0217	0.3753	0.0708	0.4462	0.1144	0.0678	0.1822		2,309.771 2	2,309.771 2	0.1521		2,313.573 5
Worker	1.1547	0.8714	11.2876	0.0263	1.5237	0.0208	1.5446	0.4202	0.0192	0.4394		2,620.211 8	2,620.211 8	0.0983		2,622.668 6
Total	**1.5319**	**10.9213**	**14.0353**	**0.0480**	**1.8991**	**0.0917**	**1.9907**	**0.5346**	**0.0870**	**0.6215**		**4,929.983 0**	**4,929.983 0**	**0.2504**		**4,936.242 1**

3.6 Paving - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6763	17.0389	12.6556	0.0189		1.0172	1.0172		0.9376	0.9376		1,901.776 6	1,901.776 6	0.5674		1,915.960 4
Paving	7.9700e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6843**	**17.0389**	**12.6556**	**0.0189**		**1.0172**	**1.0172**		**0.9376**	**0.9376**		**1,901.776 6**	**1,901.776 6**	**0.5674**		**1,915.960 4**

3.6 Paving - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1251	0.0959	1.2312	2.5900e-003	0.2236	2.0800e-003	0.2256	0.0593	1.9200e-003	0.0612		257.7835	257.7835	0.0107		258.0511
Total	**0.1251**	**0.0959**	**1.2312**	**2.5900e-003**	**0.2236**	**2.0800e-003**	**0.2256**	**0.0593**	**1.9200e-003**	**0.0612**		**257.7835**	**257.7835**	**0.0107**		**258.0511**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6763	17.0389	12.6556	0.0189		1.0172	1.0172		0.9376	0.9376	0.0000	1,901.7766	1,901.7766	0.5674		1,915.9604
Paving	7.9700e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6843**	**17.0389**	**12.6556**	**0.0189**		**1.0172**	**1.0172**		**0.9376**	**0.9376**	**0.0000**	**1,901.7766**	**1,901.7766**	**0.5674**		**1,915.9604**

3.6 Paving - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1251	0.0959	1.2312	2.5900e-003	0.1458	2.0800e-003	0.1479	0.0402	1.9200e-003	0.0421		257.7835	257.7835	0.0107		258.0511
Total	**0.1251**	**0.0959**	**1.2312**	**2.5900e-003**	**0.1458**	**2.0800e-003**	**0.1479**	**0.0402**	**1.9200e-003**	**0.0421**		**257.7835**	**257.7835**	**0.0107**		**258.0511**

3.6 Paving - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4239	14.5184	12.4333	0.0189		0.8370	0.8370		0.7718	0.7718		1,872.5505	1,872.5505	0.5672		1,886.7312
Paving	7.9700e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4319**	**14.5184**	**12.4333**	**0.0189**		**0.8370**	**0.8370**		**0.7718**	**0.7718**		**1,872.5505**	**1,872.5505**	**0.5672**		**1,886.7312**

3.6 Paving - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1105	0.0834	1.0802	2.5200e-003	0.2236	1.9900e-003	0.2256	0.0593	1.8400e-003	0.0611		250.7380	250.7380	9.4000e-003		250.9731
Total	**0.1105**	**0.0834**	**1.0802**	**2.5200e-003**	**0.2236**	**1.9900e-003**	**0.2256**	**0.0593**	**1.8400e-003**	**0.0611**		**250.7380**	**250.7380**	**9.4000e-003**		**250.9731**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4239	14.5184	12.4333	0.0189		0.8370	0.8370		0.7718	0.7718	0.0000	1,872.5505	1,872.5505	0.5672		1,886.7312
Paving	7.9700e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4319**	**14.5184**	**12.4333**	**0.0189**		**0.8370**	**0.8370**		**0.7718**	**0.7718**	**0.0000**	**1,872.5505**	**1,872.5505**	**0.5672**		**1,886.7312**

3.6 Paving - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1105	0.0834	1.0802	2.5200e-003	0.1458	1.9900e-003	0.1478	0.0402	1.8400e-003	0.0420		250.7380	250.7380	9.4000e-003		250.9731
Total	**0.1105**	**0.0834**	**1.0802**	**2.5200e-003**	**0.1458**	**1.9900e-003**	**0.1478**	**0.0402**	**1.8400e-003**	**0.0420**		**250.7380**	**250.7380**	**9.4000e-003**		**250.9731**

3.7 Architectural Coating - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	17.0642					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733		281.4481	281.4481	0.0297		282.1909
Total	**17.3965**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**		**281.4481**	**281.4481**	**0.0297**		**282.1909**

3.7 Architectural Coating - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2627	0.2015	2.5856	5.4500e-003	0.4695	4.3700e-003	0.4738	0.1245	4.0300e-003	0.1285		541.3454	541.3454	0.0225		541.9072
Total	**0.2627**	**0.2015**	**2.5856**	**5.4500e-003**	**0.4695**	**4.3700e-003**	**0.4738**	**0.1245**	**4.0300e-003**	**0.1285**		**541.3454**	**541.3454**	**0.0225**		**541.9072**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	17.0642					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733	0.0000	281.4481	281.4481	0.0297		282.1909
Total	**17.3965**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**	**0.0000**	**281.4481**	**281.4481**	**0.0297**		**282.1909**

3.7 Architectural Coating - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2627	0.2015	2.5856	5.4500e-003	0.3062	4.3700e-003	0.3106	0.0844	4.0300e-003	0.0885		541.3454	541.3454	0.0225		541.9072
Total	**0.2627**	**0.2015**	**2.5856**	**5.4500e-003**	**0.3062**	**4.3700e-003**	**0.3106**	**0.0844**	**4.0300e-003**	**0.0885**		**541.3454**	**541.3454**	**0.0225**		**541.9072**

3.7 Architectural Coating - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	17.0642					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506		281.4485	281.4485	0.0267		282.1171
Total	**17.3629**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**		**281.4485**	**281.4485**	**0.0267**		**282.1171**

3.7 Architectural Coating - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2320	0.1751	2.2683	5.2900e-003	0.4695	4.1900e-003	0.4737	0.1245	3.8600e-003	0.1284		526.5497	526.5497	0.0198		527.0435
Total	**0.2320**	**0.1751**	**2.2683**	**5.2900e-003**	**0.4695**	**4.1900e-003**	**0.4737**	**0.1245**	**3.8600e-003**	**0.1284**		**526.5497**	**526.5497**	**0.0198**		**527.0435**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	17.0642					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506	0.0000	281.4485	281.4485	0.0267		282.1171
Total	**17.3629**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**	**0.0000**	**281.4485**	**281.4485**	**0.0267**		**282.1171**

3.7 Architectural Coating - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2320	0.1751	2.2683	5.2900e-003	0.3062	4.1900e-003	0.3104	0.0844	3.8600e-003	0.0883		526.5497	526.5497	0.0198		527.0435
Total	**0.2320**	**0.1751**	**2.2683**	**5.2900e-003**	**0.3062**	**4.1900e-003**	**0.3104**	**0.0844**	**3.8600e-003**	**0.0883**		**526.5497**	**526.5497**	**0.0198**		**527.0435**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	5.4037	22.4374	64.4136	0.1749	7.2023	0.2070	7.4092	2.0473	0.1947	2.2420		17,733.7558	17,733.7558	1.1077		17,761.4482
Unmitigated	5.4037	22.4374	64.4136	0.1749	7.2023	0.2070	7.4092	2.0473	0.1947	2.2420		17,733.7558	17,733.7558	1.1077		17,761.4482

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Hotel	461.16	461.16	461.16	1,100,407	1,100,407
Hotel	777.14	777.14	777.14	1,854,389	1,854,389
Parking Lot	0.00	0.00	0.00		
Total	1,238.30	1,238.30	1,238.30	2,954,796	2,954,796

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Hotel	16.60	8.40	6.90	19.40	61.60	19.00	58	38	4
Hotel	16.60	8.40	6.90	19.40	61.60	19.00	58	38	4
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Hotel	0.547972	0.046127	0.199330	0.125604	0.017697	0.005953	0.018360	0.027618	0.002341	0.002583	0.004804	0.000667	0.000944
Hotel	0.547972	0.046127	0.199330	0.125604	0.017697	0.005953	0.018360	0.027618	0.002341	0.002583	0.004804	0.000667	0.000944
Parking Lot	0.547972	0.046127	0.199330	0.125604	0.017697	0.005953	0.018360	0.027618	0.002341	0.002583	0.004804	0.000667	0.000944

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.2996	2.7235	2.2877	0.0163		0.2070	0.2070		0.2070	0.2070		3,268.205 1	3,268.205 1	0.0626	0.0599	3,287.626 4
NaturalGas Unmitigated	0.2996	2.7235	2.2877	0.0163		0.2070	0.2070		0.2070	0.2070		3,268.205 1	3,268.205 1	0.0626	0.0599	3,287.626 4

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Hotel	10345.6	0.1116	1.0143	0.8520	6.0900e-003		0.0771	0.0771		0.0771	0.0771		1,217.1247	1,217.1247	0.0233	0.0223	1,224.3574
Hotel	17434.2	0.1880	1.7092	1.4358	0.0103		0.1299	0.1299		0.1299	0.1299		2,051.0805	2,051.0805	0.0393	0.0376	2,063.2690
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.2996**	**2.7235**	**2.2878**	**0.0164**		**0.2070**	**0.2070**		**0.2070**	**0.2070**		**3,268.2051**	**3,268.2051**	**0.0626**	**0.0599**	**3,287.6264**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Hotel	17.4342	0.1880	1.7092	1.4358	0.0103		0.1299	0.1299		0.1299	0.1299		2,051.0805	2,051.0805	0.0393	0.0376	2,063.2690
Hotel	10.3456	0.1116	1.0143	0.8520	6.0900e-003		0.0771	0.0771		0.0771	0.0771		1,217.1247	1,217.1247	0.0233	0.0223	1,224.3574
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.2996**	**2.7235**	**2.2878**	**0.0164**		**0.2070**	**0.2070**		**0.2070**	**0.2070**		**3,268.2051**	**3,268.2051**	**0.0626**	**0.0599**	**3,287.6264**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	9.4446	4.7000e-004	0.0499	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004		0.1055	0.1055	2.9000e-004		0.1127
Unmitigated	9.4446	4.7000e-004	0.0499	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004		0.1055	0.1055	2.9000e-004		0.1127

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.0753					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	8.3646					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.7700e-003	4.7000e-004	0.0499	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004		0.1055	0.1055	2.9000e-004		0.1127
Total	**9.4446**	**4.7000e-004**	**0.0499**	**0.0000**		**1.8000e-004**	**1.8000e-004**		**1.8000e-004**	**1.8000e-004**		**0.1055**	**0.1055**	**2.9000e-004**		**0.1127**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.0753					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	8.3646					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.7700e-003	4.7000e-004	0.0499	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004		0.1055	0.1055	2.9000e-004		0.1127
Total	**9.4446**	**4.7000e-004**	**0.0499**	**0.0000**		**1.8000e-004**	**1.8000e-004**		**1.8000e-004**	**1.8000e-004**		**0.1055**	**0.1055**	**2.9000e-004**		**0.1127**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Wayne Mills Place Project

Los Angeles-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Hotel	108.00	Room	1.30	156,816.00	0
Hotel	182.00	Room	2.30	264,264.00	0
Parking Lot	192.00	Space	0.70	76,800.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2018
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Acreage adjusted per project applicant.

Construction Phase - Construction, paving, and painting assumed to occur simultaneously.

Demolition -

Vehicle Trips - Adjusted rates per traffic report.

Construction Off-road Equipment Mitigation - Per SCAQMD CEQA Handbook.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	40
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	15
tblConstructionPhase	NumDays	18.00	230.00
tblConstructionPhase	NumDays	18.00	230.00
tblConstructionPhase	PhaseEndDate	4/23/2018	3/2/2018
tblConstructionPhase	PhaseEndDate	3/28/2018	3/2/2018
tblConstructionPhase	PhaseStartDate	3/29/2018	4/15/2017
tblConstructionPhase	PhaseStartDate	3/3/2018	4/15/2017
tblLandUse	LotAcreage	3.60	1.30
tblLandUse	LotAcreage	6.07	2.30
tblLandUse	LotAcreage	1.73	0.70
tblVehicleTrips	ST_TR	8.19	4.27
tblVehicleTrips	SU_TR	5.95	4.27
tblVehicleTrips	WD_TR	8.17	4.27

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	24.5152	57.9468	51.4849	0.1031	18.2675	3.0975	21.1479	9.9840	2.9030	12.6341	0.0000	10,380.8633	10,380.8633	1.5585	0.0000	10,419.8248
2018	23.5245	51.2380	48.3643	0.1021	3.5541	2.5864	6.1405	0.9545	2.4260	3.3804	0.0000	10,222.3239	10,222.3239	1.5187	0.0000	10,260.2914
Maximum	**24.5152**	**57.9468**	**51.4849**	**0.1031**	**18.2675**	**3.0975**	**21.1479**	**9.9840**	**2.9030**	**12.6341**	**0.0000**	**10,380.8633**	**10,380.8633**	**1.5585**	**0.0000**	**10,419.8248**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	24.5152	57.9468	51.4849	0.1031	7.0416	3.0975	9.9220	3.8347	2.9030	6.4847	0.0000	10,380.8633	10,380.8633	1.5585	0.0000	10,419.8248
2018	23.5245	51.2380	48.3643	0.1021	2.3511	2.5864	4.9375	0.6592	2.4260	3.0852	0.0000	10,222.3239	10,222.3239	1.5187	0.0000	10,260.2914
Maximum	**24.5152**	**57.9468**	**51.4849**	**0.1031**	**7.0416**	**3.0975**	**9.9220**	**3.8347**	**2.9030**	**6.4847**	**0.0000**	**10,380.8633**	**10,380.8633**	**1.5585**	**0.0000**	**10,419.8248**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**56.96**	**0.00**	**45.55**	**58.92**	**0.00**	**40.24**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	9.4446	4.7000e-004	0.0499	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004		0.1055	0.1055	2.9000e-004		0.1127
Energy	0.2996	2.7235	2.2877	0.0163		0.2070	0.2070		0.2070	0.2070		3,268.2051	3,268.2051	0.0626	0.0599	3,287.6264
Mobile	5.2838	23.0104	62.2853	0.1661	7.2023	0.2088	7.4111	2.0473	0.1965	2.2438		16,850.9120	16,850.9120	1.1077		16,878.6047
Total	**15.0280**	**25.7344**	**64.6230**	**0.1824**	**7.2023**	**0.4160**	**7.6182**	**2.0473**	**0.4037**	**2.4509**		**20,119.2227**	**20,119.2227**	**1.1706**	**0.0599**	**20,166.3438**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	9.4446	4.7000e-004	0.0499	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004		0.1055	0.1055	2.9000e-004		0.1127
Energy	0.2996	2.7235	2.2877	0.0163		0.2070	0.2070		0.2070	0.2070		3,268.2051	3,268.2051	0.0626	0.0599	3,287.6264
Mobile	5.2838	23.0104	62.2853	0.1661	7.2023	0.2088	7.4111	2.0473	0.1965	2.2438		16,850.9120	16,850.9120	1.1077		16,878.6047
Total	**15.0280**	**25.7344**	**64.6230**	**0.1824**	**7.2023**	**0.4160**	**7.6182**	**2.0473**	**0.4037**	**2.4509**		**20,119.2227**	**20,119.2227**	**1.1706**	**0.0599**	**20,166.3438**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	3/1/2017	3/28/2017	5	20	
2	Site Preparation	Site Preparation	3/29/2017	4/4/2017	5	5	
3	Grading	Grading	4/5/2017	4/14/2017	5	8	
4	Building Construction	Building Construction	4/15/2017	3/2/2018	5	230	
5	Paving	Paving	4/15/2017	3/2/2018	5	230	
6	Architectural Coating	Architectural Coating	4/15/2017	3/2/2018	5	230	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4

Acres of Paving: 0.7

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 631,620; Non-Residential Outdoor: 210,540; Striped Parking Area: 4,608 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Grading	Excavators	1	8.00	158	0.38
Paving	Pavers	1	8.00	130	0.42
Paving	Rollers	2	6.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Paving	Paving Equipment	2	6.00	132	0.36
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	1	42.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	209.00	82.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	6	15.00	0.00	793.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Demolition - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.5757	0.0000	8.5757	1.2984	0.0000	1.2984			0.0000			0.0000
Off-Road	4.1031	42.7475	23.0122	0.0388		2.1935	2.1935		2.0425	2.0425		3,924.2833	3,924.2833	1.0730		3,951.1070
Total	**4.1031**	**42.7475**	**23.0122**	**0.0388**	**8.5757**	**2.1935**	**10.7692**	**1.2984**	**2.0425**	**3.3410**		**3,924.2833**	**3,924.2833**	**1.0730**		**3,951.1070**

3.2 Demolition - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.4583	13.9845	3.0133	0.0319	0.6932	0.0740	0.7671	0.1900	0.0708	0.2608		3,443.735 5	3,443.735 5	0.2543		3,450.093 2
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1037	0.0797	0.8549	1.8300e-003	0.1677	1.5600e-003	0.1692	0.0445	1.4400e-003	0.0459		182.0869	182.0869	7.6100e-003		182.2772
Total	**0.5621**	**14.0641**	**3.8681**	**0.0338**	**0.8608**	**0.0755**	**0.9364**	**0.2345**	**0.0722**	**0.3067**		**3,625.822 5**	**3,625.822 5**	**0.2619**		**3,632.370 4**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.2802	0.0000	3.2802	0.4967	0.0000	0.4967			0.0000			0.0000
Off-Road	4.1031	42.7475	23.0122	0.0388		2.1935	2.1935		2.0425	2.0425	0.0000	3,924.283 3	3,924.283 3	1.0730		3,951.107 0
Total	**4.1031**	**42.7475**	**23.0122**	**0.0388**	**3.2802**	**2.1935**	**5.4737**	**0.4967**	**2.0425**	**2.5392**	**0.0000**	**3,924.283 3**	**3,924.283 3**	**1.0730**		**3,951.107 0**

3.2 Demolition - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.4583	13.9845	3.0133	0.0319	0.4835	0.0740	0.5575	0.1385	0.0708	0.2093		3,443.735 5	3,443.735 5	0.2543		3,450.093 2
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1037	0.0797	0.8549	1.8300e-003	0.1094	1.5600e-003	0.1109	0.0302	1.4400e-003	0.0316		182.0869	182.0869	7.6100e-003		182.2772
Total	**0.5621**	**14.0641**	**3.8681**	**0.0338**	**0.5929**	**0.0755**	**0.6684**	**0.1687**	**0.0722**	**0.2409**		**3,625.822 5**	**3,625.822 5**	**0.2619**		**3,632.370 4**

3.3 Site Preparation - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.9608	52.2754	23.4554	0.0380		2.8786	2.8786		2.6483	2.6483		3,894.950 0	3,894.950 0	1.1934		3,924.785 2
Total	**4.9608**	**52.2754**	**23.4554**	**0.0380**	**18.0663**	**2.8786**	**20.9448**	**9.9307**	**2.6483**	**12.5790**		**3,894.950 0**	**3,894.950 0**	**1.1934**		**3,924.785 2**

3.3 Site Preparation - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1245	0.0956	1.0259	2.2000e-003	0.2012	1.8700e-003	0.2031	0.0534	1.7300e-003	0.0551		218.5043	218.5043	9.1300e-003		218.7326
Total	**0.1245**	**0.0956**	**1.0259**	**2.2000e-003**	**0.2012**	**1.8700e-003**	**0.2031**	**0.0534**	**1.7300e-003**	**0.0551**		**218.5043**	**218.5043**	**9.1300e-003**		**218.7326**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.9103	0.0000	6.9103	3.7985	0.0000	3.7985			0.0000			0.0000
Off-Road	4.9608	52.2754	23.4554	0.0380		2.8786	2.8786		2.6483	2.6483	0.0000	3,894.950 0	3,894.950 0	1.1934		3,924.785 2
Total	**4.9608**	**52.2754**	**23.4554**	**0.0380**	**6.9103**	**2.8786**	**9.7889**	**3.7985**	**2.6483**	**6.4468**	**0.0000**	**3,894.950 0**	**3,894.950 0**	**1.1934**		**3,924.785 2**

3.3 Site Preparation - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1245	0.0956	1.0259	2.2000e-003	0.1312	1.8700e-003	0.1331	0.0362	1.7300e-003	0.0379		218.5043	218.5043	9.1300e-003		218.7326
Total	**0.1245**	**0.0956**	**1.0259**	**2.2000e-003**	**0.1312**	**1.8700e-003**	**0.1331**	**0.0362**	**1.7300e-003**	**0.0379**		**218.5043**	**218.5043**	**9.1300e-003**		**218.7326**

3.4 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	3.0705	33.8868	17.1042	0.0297		1.7774	1.7774		1.6352	1.6352		3,037.9107	3,037.9107	0.9308		3,061.1809
Total	**3.0705**	**33.8868**	**17.1042**	**0.0297**	**6.5523**	**1.7774**	**8.3298**	**3.3675**	**1.6352**	**5.0027**		**3,037.9107**	**3,037.9107**	**0.9308**		**3,061.1809**

3.4 Grading - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1037	0.0797	0.8549	1.8300e-003	0.1677	1.5600e-003	0.1692	0.0445	1.4400e-003	0.0459		182.0869	182.0869	7.6100e-003		182.2772
Total	**0.1037**	**0.0797**	**0.8549**	**1.8300e-003**	**0.1677**	**1.5600e-003**	**0.1692**	**0.0445**	**1.4400e-003**	**0.0459**		**182.0869**	**182.0869**	**7.6100e-003**		**182.2772**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.5063	0.0000	2.5063	1.2881	0.0000	1.2881			0.0000			0.0000
Off-Road	3.0705	33.8868	17.1042	0.0297		1.7774	1.7774		1.6352	1.6352	0.0000	3,037.910 7	3,037.910 7	0.9308		3,061.180 9
Total	**3.0705**	**33.8868**	**17.1042**	**0.0297**	**2.5063**	**1.7774**	**4.2837**	**1.2881**	**1.6352**	**2.9233**	**0.0000**	**3,037.910 7**	**3,037.910 7**	**0.9308**		**3,061.180 9**

3.4 Grading - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1037	0.0797	0.8549	1.8300e-003	0.1094	1.5600e-003	0.1109	0.0302	1.4400e-003	0.0316		182.0869	182.0869	7.6100e-003		182.2772
Total	**0.1037**	**0.0797**	**0.8549**	**1.8300e-003**	**0.1094**	**1.5600e-003**	**0.1109**	**0.0302**	**1.4400e-003**	**0.0316**		**182.0869**	**182.0869**	**7.6100e-003**		**182.2772**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.1149	26.5546	18.1825	0.0269		1.7879	1.7879		1.6791	1.6791		2,650.9797	2,650.9797	0.6531		2,667.3078
Total	**3.1149**	**26.5546**	**18.1825**	**0.0269**		**1.7879**	**1.7879**		**1.6791**	**1.6791**		**2,650.9797**	**2,650.9797**	**0.6531**		**2,667.3078**

3.5 Building Construction - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4455	10.7288	3.3338	0.0212	0.5249	0.0909	0.6159	0.1511	0.0870	0.2381		2,256.955 1	2,256.955 1	0.1708		2,261.225 0
Worker	1.4452	1.1102	11.9114	0.0255	2.3361	0.0217	2.3579	0.6196	0.0201	0.6396		2,537.077 8	2,537.077 8	0.1060		2,539.728 4
Total	**1.8907**	**11.8390**	**15.2452**	**0.0467**	**2.8611**	**0.1127**	**2.9737**	**0.7707**	**0.1070**	**0.8777**		**4,794.033 0**	**4,794.033 0**	**0.2768**		**4,800.953 4**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.1149	26.5546	18.1825	0.0269		1.7879	1.7879		1.6791	1.6791	0.0000	2,650.979 7	2,650.979 7	0.6531		2,667.307 8
Total	**3.1149**	**26.5546**	**18.1825**	**0.0269**		**1.7879**	**1.7879**		**1.6791**	**1.6791**	**0.0000**	**2,650.979 7**	**2,650.979 7**	**0.6531**		**2,667.307 8**

3.5 Building Construction - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4455	10.7288	3.3338	0.0212	0.3753	0.0909	0.4663	0.1144	0.0870	0.2014		2,256.955 1	2,256.955 1	0.1708		2,261.225 0
Worker	1.4452	1.1102	11.9114	0.0255	1.5237	0.0217	1.5455	0.4202	0.0201	0.4402		2,537.077 8	2,537.077 8	0.1060		2,539.728 4
Total	**1.8907**	**11.8390**	**15.2452**	**0.0467**	**1.8991**	**0.1127**	**2.0117**	**0.5346**	**0.1070**	**0.6416**		**4,794.033 0**	**4,794.033 0**	**0.2768**		**4,800.953 4**

3.5 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099		2,620.935 1	2,620.935 1	0.6421		2,636.988 3
Total	**2.6795**	**23.3900**	**17.5804**	**0.0269**		**1.4999**	**1.4999**		**1.4099**	**1.4099**		**2,620.935 1**	**2,620.935 1**	**0.6421**		**2,636.988 3**

3.5 Building Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.3931	10.0725	3.0204	0.0211	0.5249	0.0720	0.5969	0.1511	0.0688	0.2200		2,248.0288	2,248.0288	0.1622		2,252.0838
Worker	1.2780	0.9650	10.3929	0.0248	2.3361	0.0208	2.3570	0.6196	0.0192	0.6388		2,467.4038	2,467.4038	0.0929		2,469.7252
Total	**1.6711**	**11.0375**	**13.4133**	**0.0459**	**2.8611**	**0.0928**	**2.9539**	**0.7707**	**0.0880**	**0.8587**		**4,715.4326**	**4,715.4326**	**0.2551**		**4,721.8091**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099	0.0000	2,620.9351	2,620.9351	0.6421		2,636.9883
Total	**2.6795**	**23.3900**	**17.5804**	**0.0269**		**1.4999**	**1.4999**		**1.4099**	**1.4099**	**0.0000**	**2,620.9351**	**2,620.9351**	**0.6421**		**2,636.9883**

3.5 Building Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.3931	10.0725	3.0204	0.0211	0.3753	0.0720	0.4473	0.1144	0.0688	0.1833		2,248.0288	2,248.0288	0.1622		2,252.0838
Worker	1.2780	0.9650	10.3929	0.0248	1.5237	0.0208	1.5446	0.4202	0.0192	0.4394		2,467.4038	2,467.4038	0.0929		2,469.7252
Total	**1.6711**	**11.0375**	**13.4133**	**0.0459**	**1.8991**	**0.0928**	**1.9919**	**0.5346**	**0.0880**	**0.6226**		**4,715.4326**	**4,715.4326**	**0.2551**		**4,721.8091**

3.6 Paving - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6763	17.0389	12.6556	0.0189		1.0172	1.0172		0.9376	0.9376		1,901.7766	1,901.7766	0.5674		1,915.9604
Paving	7.9700e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6843**	**17.0389**	**12.6556**	**0.0189**		**1.0172**	**1.0172**		**0.9376**	**0.9376**		**1,901.7766**	**1,901.7766**	**0.5674**		**1,915.9604**

3.6 Paving - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1383	0.1062	1.1398	2.4400e-003	0.2236	2.0800e-003	0.2256	0.0593	1.9200e-003	0.0612		242.7826	242.7826	0.0102		243.0362
Total	**0.1383**	**0.1062**	**1.1398**	**2.4400e-003**	**0.2236**	**2.0800e-003**	**0.2256**	**0.0593**	**1.9200e-003**	**0.0612**		**242.7826**	**242.7826**	**0.0102**		**243.0362**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6763	17.0389	12.6556	0.0189		1.0172	1.0172		0.9376	0.9376	0.0000	1,901.776 6	1,901.776 6	0.5674		1,915.960 4
Paving	7.9700e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6843**	**17.0389**	**12.6556**	**0.0189**		**1.0172**	**1.0172**		**0.9376**	**0.9376**	**0.0000**	**1,901.776 6**	**1,901.776 6**	**0.5674**		**1,915.960 4**

3.6 Paving - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1383	0.1062	1.1398	2.4400e-003	0.1458	2.0800e-003	0.1479	0.0402	1.9200e-003	0.0421		242.7826	242.7826	0.0102		243.0362
Total	**0.1383**	**0.1062**	**1.1398**	**2.4400e-003**	**0.1458**	**2.0800e-003**	**0.1479**	**0.0402**	**1.9200e-003**	**0.0421**		**242.7826**	**242.7826**	**0.0102**		**243.0362**

3.6 Paving - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4239	14.5184	12.4333	0.0189		0.8370	0.8370		0.7718	0.7718		1,872.550 5	1,872.550 5	0.5672		1,886.731 2
Paving	7.9700e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4319**	**14.5184**	**12.4333**	**0.0189**		**0.8370**	**0.8370**		**0.7718**	**0.7718**		**1,872.550 5**	**1,872.550 5**	**0.5672**		**1,886.731 2**

3.6 Paving - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1223	0.0923	0.9945	2.3700e-003	0.2236	1.9900e-003	0.2256	0.0593	1.8400e-003	0.0611		236.1152	236.1152	8.8900e-003		236.3373
Total	**0.1223**	**0.0923**	**0.9945**	**2.3700e-003**	**0.2236**	**1.9900e-003**	**0.2256**	**0.0593**	**1.8400e-003**	**0.0611**		**236.1152**	**236.1152**	**8.8900e-003**		**236.3373**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4239	14.5184	12.4333	0.0189		0.8370	0.8370		0.7718	0.7718	0.0000	1,872.550 5	1,872.550 5	0.5672		1,886.731 2
Paving	7.9700e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4319**	**14.5184**	**12.4333**	**0.0189**		**0.8370**	**0.8370**		**0.7718**	**0.7718**	**0.0000**	**1,872.550 5**	**1,872.550 5**	**0.5672**		**1,886.731 2**

3.6 Paving - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1223	0.0923	0.9945	2.3700e-003	0.1458	1.9900e-003	0.1478	0.0402	1.8400e-003	0.0420		236.1152	236.1152	8.8900e-003		236.3373
Total	**0.1223**	**0.0923**	**0.9945**	**2.3700e-003**	**0.1458**	**1.9900e-003**	**0.1478**	**0.0402**	**1.8400e-003**	**0.0420**		**236.1152**	**236.1152**	**8.8900e-003**		**236.3373**

3.7 Architectural Coating - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	17.0642					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733		281.4481	281.4481	0.0297		282.1909
Total	**17.3965**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**		**281.4481**	**281.4481**	**0.0297**		**282.1909**

3.7 Architectural Coating - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2904	0.2231	2.3937	5.1300e-003	0.4695	4.3700e-003	0.4738	0.1245	4.0300e-003	0.1285		509.8434	509.8434	0.0213		510.3760
Total	**0.2904**	**0.2231**	**2.3937**	**5.1300e-003**	**0.4695**	**4.3700e-003**	**0.4738**	**0.1245**	**4.0300e-003**	**0.1285**		**509.8434**	**509.8434**	**0.0213**		**510.3760**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	17.0642					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733	0.0000	281.4481	281.4481	0.0297		282.1909
Total	**17.3965**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**	**0.0000**	**281.4481**	**281.4481**	**0.0297**		**282.1909**

3.7 Architectural Coating - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2904	0.2231	2.3937	5.1300e-003	0.3062	4.3700e-003	0.3106	0.0844	4.0300e-003	0.0885		509.8434	509.8434	0.0213		510.3760
Total	**0.2904**	**0.2231**	**2.3937**	**5.1300e-003**	**0.3062**	**4.3700e-003**	**0.3106**	**0.0844**	**4.0300e-003**	**0.0885**		**509.8434**	**509.8434**	**0.0213**		**510.3760**

3.7 Architectural Coating - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	17.0642					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506		281.4485	281.4485	0.0267		282.1171
Total	**17.3629**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**		**281.4485**	**281.4485**	**0.0267**		**282.1171**

3.7 Architectural Coating - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2568	0.1939	2.0885	4.9800e-003	0.4695	4.1900e-003	0.4737	0.1245	3.8600e-003	0.1284		495.8419	495.8419	0.0187		496.3084
Total	**0.2568**	**0.1939**	**2.0885**	**4.9800e-003**	**0.4695**	**4.1900e-003**	**0.4737**	**0.1245**	**3.8600e-003**	**0.1284**		**495.8419**	**495.8419**	**0.0187**		**496.3084**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	17.0642					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506	0.0000	281.4485	281.4485	0.0267		282.1171
Total	**17.3629**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**	**0.0000**	**281.4485**	**281.4485**	**0.0267**		**282.1171**

3.7 Architectural Coating - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2568	0.1939	2.0885	4.9800e-003	0.3062	4.1900e-003	0.3104	0.0844	3.8600e-003	0.0883		495.8419	495.8419	0.0187		496.3084
Total	**0.2568**	**0.1939**	**2.0885**	**4.9800e-003**	**0.3062**	**4.1900e-003**	**0.3104**	**0.0844**	**3.8600e-003**	**0.0883**		**495.8419**	**495.8419**	**0.0187**		**496.3084**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	5.2838	23.0104	62.2853	0.1661	7.2023	0.2088	7.4111	2.0473	0.1965	2.2438		16,850.9120	16,850.9120	1.1077		16,878.6047
Unmitigated	5.2838	23.0104	62.2853	0.1661	7.2023	0.2088	7.4111	2.0473	0.1965	2.2438		16,850.9120	16,850.9120	1.1077		16,878.6047

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Hotel	461.16	461.16	461.16	1,100,407	1,100,407
Hotel	777.14	777.14	777.14	1,854,389	1,854,389
Parking Lot	0.00	0.00	0.00		
Total	1,238.30	1,238.30	1,238.30	2,954,796	2,954,796

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Hotel	16.60	8.40	6.90	19.40	61.60	19.00	58	38	4
Hotel	16.60	8.40	6.90	19.40	61.60	19.00	58	38	4
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Hotel	0.547972	0.046127	0.199330	0.125604	0.017697	0.005953	0.018360	0.027618	0.002341	0.002583	0.004804	0.000667	0.000944
Hotel	0.547972	0.046127	0.199330	0.125604	0.017697	0.005953	0.018360	0.027618	0.002341	0.002583	0.004804	0.000667	0.000944
Parking Lot	0.547972	0.046127	0.199330	0.125604	0.017697	0.005953	0.018360	0.027618	0.002341	0.002583	0.004804	0.000667	0.000944

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.2996	2.7235	2.2877	0.0163		0.2070	0.2070		0.2070	0.2070		3,268.2051	3,268.2051	0.0626	0.0599	3,287.6264
NaturalGas Unmitigated	0.2996	2.7235	2.2877	0.0163		0.2070	0.2070		0.2070	0.2070		3,268.2051	3,268.2051	0.0626	0.0599	3,287.6264

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Hotel	10345.6	0.1116	1.0143	0.8520	6.0900e-003		0.0771	0.0771		0.0771	0.0771		1,217.1247	1,217.1247	0.0233	0.0223	1,224.3574
Hotel	17434.2	0.1880	1.7092	1.4358	0.0103		0.1299	0.1299		0.1299	0.1299		2,051.0805	2,051.0805	0.0393	0.0376	2,063.2690
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.2996**	**2.7235**	**2.2878**	**0.0164**		**0.2070**	**0.2070**		**0.2070**	**0.2070**		**3,268.2051**	**3,268.2051**	**0.0626**	**0.0599**	**3,287.6264**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Hotel	10.3456	0.1116	1.0143	0.8520	6.0900e-003		0.0771	0.0771		0.0771	0.0771		1,217.1247	1,217.1247	0.0233	0.0223	1,224.3574
Hotel	17.4342	0.1880	1.7092	1.4358	0.0103		0.1299	0.1299		0.1299	0.1299		2,051.0805	2,051.0805	0.0393	0.0376	2,063.2690
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.2996**	**2.7235**	**2.2878**	**0.0164**		**0.2070**	**0.2070**		**0.2070**	**0.2070**		**3,268.2051**	**3,268.2051**	**0.0626**	**0.0599**	**3,287.6264**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	9.4446	4.7000e-004	0.0499	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004		0.1055	0.1055	2.9000e-004		0.1127
Unmitigated	9.4446	4.7000e-004	0.0499	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004		0.1055	0.1055	2.9000e-004		0.1127

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.0753					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	8.3646					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.7700e-003	4.7000e-004	0.0499	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004		0.1055	0.1055	2.9000e-004		0.1127
Total	**9.4446**	**4.7000e-004**	**0.0499**	**0.0000**		**1.8000e-004**	**1.8000e-004**		**1.8000e-004**	**1.8000e-004**		**0.1055**	**0.1055**	**2.9000e-004**		**0.1127**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.0753					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	8.3646					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.7700e-003	4.7000e-004	0.0499	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004		0.1055	0.1055	2.9000e-004		0.1127
Total	**9.4446**	**4.7000e-004**	**0.0499**	**0.0000**		**1.8000e-004**	**1.8000e-004**		**1.8000e-004**	**1.8000e-004**		**0.1055**	**0.1055**	**2.9000e-004**		**0.1127**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX B
TRAFFIC IMPACT STUDY

TRAFFIC IMPACT STUDY

For

Valencia Springhill Suites
Plus Residence Inn

Santa Clarita, California

Submitted To:

Excel Hotel Group
10660 Scripps Ranch Boulevard, Suite 100,
San Diego, California 92131

Submitted By:

Darnell & Associates, Inc.
4411 Mercury Street, Suite 207A
San Diego California, 92111

September 14, 2016

Darnell & Associates, Inc.

TRANSPORTATION PLANNING & TRAFFIC ENGINEERING

September 14, 2016

Neil Patel
Excel Hotel Group
10660 Scripps Ranch Boulevard, Suite 100,
San Diego, California 92123

D&A Ref. No.: 160605

Subject: Traffic Impact Study for the Proposed Valencia Springhill Suites Plus the Residence Inn located in Santa Clarita, California

Dear Mr. Neil Patel:

In accordance with your authorization, Darnell & Associates, Inc. (D&A) has prepared this Traffic Impact Study assessing the impacts associated with the proposed project located on the southside of Wayne Mills Place in the City of Santa Clarita.

The Traffic Impact Study analyzes the traffic impacts related to the project oN the surrounding roadways and intersections under the following conditions: Existing and Existing Plus Project Conditions.

If you have any questions, please feel free to contact the office.

Sincerely,

DARNELL & ASSOCIATES, INC.

Bill E Darnell

REGISTERED PROFESSIONAL ENGINEER
BILL E. DARNELL
No. 22338
CIVIL
STATE OF CALIFORNIA

Bill E. Darnell, P.E.
Firm Principal
RCE 22338

Date Signed: 9/14/2016

BED/jam
160605 - Springhill Suites Residential Inn-Valencia Traffic Study/09/16

TRAFFIC IMPACT STUDY

FOR

VALENCIA SPRINGHILL SUITES PLUS RESIDENCE INN

SANTA CLARITA, CALIFORNIA

Submitted To:

Excel Hotel Group
10660 Scripps Ranch Boulevard, Suite 100,
San Diego, California 92131

Submitted By:

Darnell & Associates, Inc.
4411 Mercury Street, Suite 207A
San Diego California, 92111
(619) 233-9373

September 14, 2016
160605 - Springhill Suites Residential Inn-Valencia Traffic Study/09/16

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICIES

APPENDIX A
- 24-Hour Segment Counts
- AM/PM Peak Hour Turn Counts

APPENDIX B
- Existing Conditions Analysis Worksheets

APPENDIX C
- Existing + Project Conditions Analysis Worksheets

APPENDIX D
- 2017 Opening Day Conditions Analysis Worksheets

SECTION I – INTRODUCTION

This traffic study evaluates the traffic conditions associated with the proposed Valencia Springhill plus Residence Inn project (herein referred to as "the project") located at 27413 Wayne Mills Place in the City of Santa Clarita, CA. Figure 1 illustrates the location of the project site in the region.

PROJECT DESCRIPTION

The project site is generally located on the south side of Wayne Mills Place, east of I-5, and west of Tourney Road. The existing site currently is occupied by a 120-Room Best Western Hotel. The project will construct a 182-Room Springhill Suites/Residence Inn and a 108-room Holiday Inn Express on the existing Best Western Site. Access to the project will be through an existing driveway located on Wayne Mills Place. Figure 2 illustrates the project site plan.

SCENARIOS STUDIED

The following list contains the scenarios analyzed for the project:

Existing Conditions: This scenario refers to the conditions at the time traffic volume counts were obtained in July 2016 and account for the existing lane configurations at the study intersections and roadway segments.

Existing Plus Project Conditions: This scenario includes the project traffic, which is added to the existing traffic volumes.

2017 Opening Day Conditions: This scenario includes the project traffic, with 3% ambient growth added to the existing traffic volumes.

LEVEL OF SERVICE

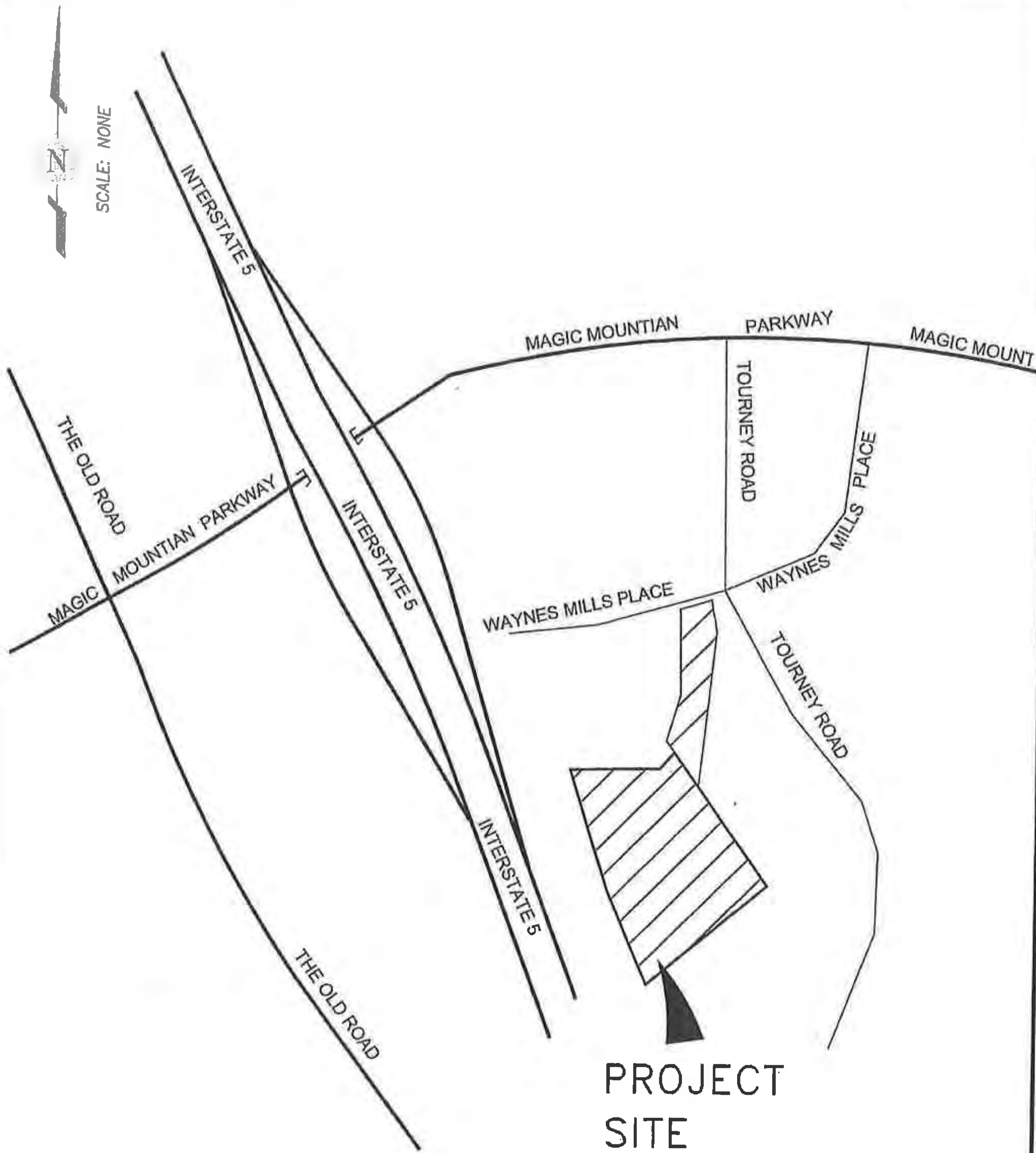
Level of Service (LOS) is a professional industry standard by which the operating conditions of a given roadway segment or intersection are measured. Level of Service is defined on a scale of A to F; where LOS A represents the best operating conditions and LOS F represents the worst operating conditions. LOS A facilities are characterized as having free flowing traffic conditions with no restrictions on maneuvering or operating speeds; traffic volumes are low and travel speeds are high. LOS F facilities are characterized as having forced flow with many stoppages and low operating speeds.

For all signalized study area intersections, the Intersection Capacity Utilization (ICU) methodology is utilized to assess the operation and performance of the intersection. The ICU represents the ratio of the volume of traffic using the intersection with the capacity of the intersection.

For all unsignalized area intersections, the Highway Capacity Manual (HCM) methodology is utilized to estimate the LOS. The HCM method estimates the LOS based on intersection delay.

LOS along the roadway segments in the study area is determined utilizing the City's volume to capacity at urban arterial highways.

Table 1 shows the criteria used for intersections. Table 2 summarizes the criteria used along arterial roadways. In the City of Santa Clarita, LOS D is considered the acceptable threshold for intersections and roadway segments.

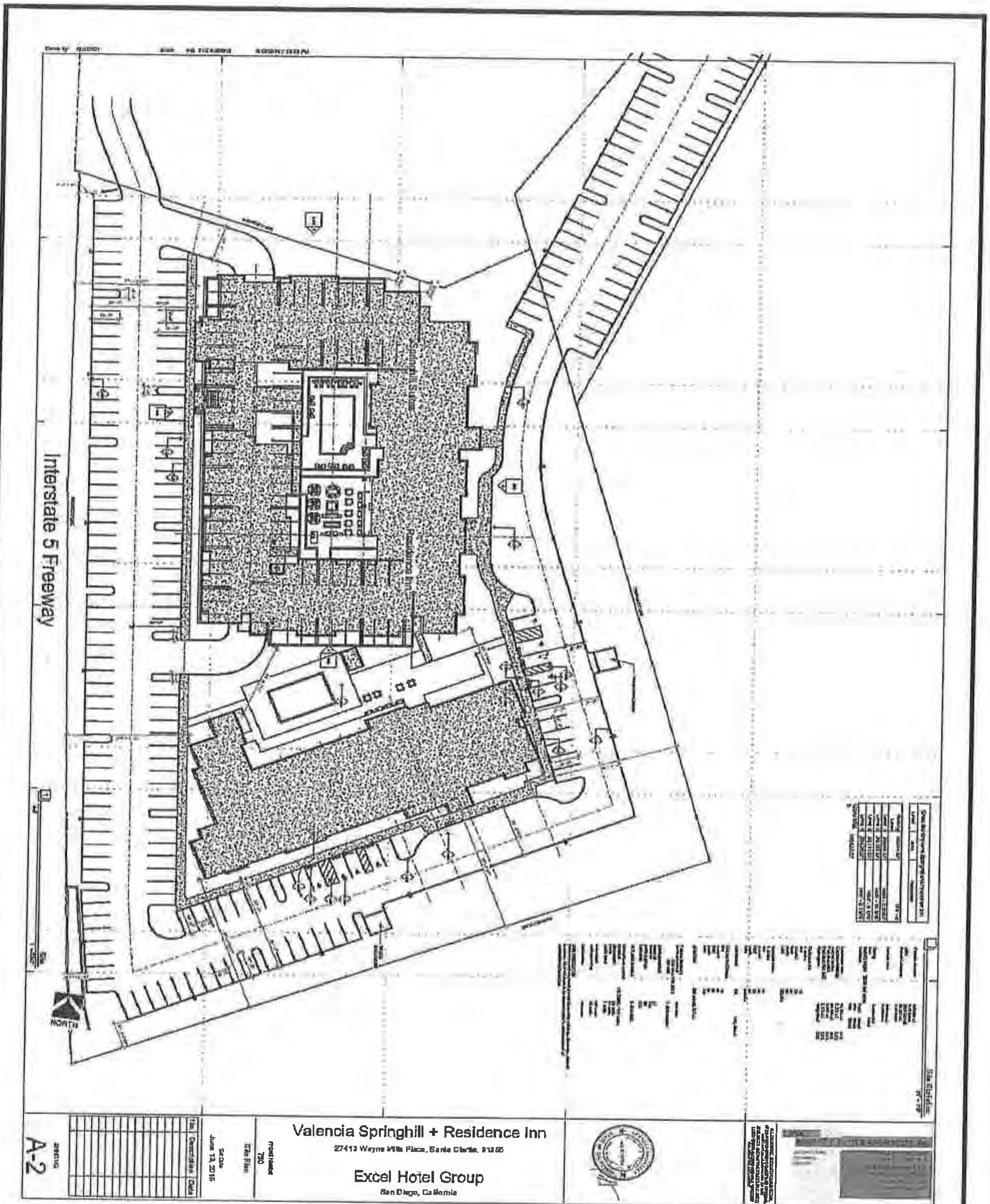


BILL E. DARNELL
No. 22338
Exp. 9-30-17
CIVIL
REGISTERED PROFESSIONAL ENGINEER
STATE OF CALIFORNIA

Darnell & ASSOCIATES, INC.
2870 MERCURY STREET, SUITE 207A
SAN DIEGO, CA 92111
(619) 233-9373

DWG: 160805-AA DATE: September 15, 2016 BY: JAB

FIGURE 1
VICINITY MAP



Darnell & ASSOCIATES, INC.

160605-AA.dwg 09-14-16 JAM

FIGURE 2
PROJECT SITE PLAN

Table 1 - Level of Service Criteria at Intersections		
LOS	Intersections	
	Signalized Volume-to-Capacity Ratio (ICU)[1]	Unsignalized Delay (Seconds/Vehicle)[2]
A	0.00 – 0.60	Less than or Equal to 10.0
B	0.61 – 0.70	10.1 to 15.0
C	0.71 to 0.80	15.1 to 25.0
D	0.81 – 0.90	25.1 to 35.0
E	0.91 – 1.00	35.1 to 50.0
F	> 1.00	> 50.0

[1] The volume of traffic using the intersection is compared with the capacity of the intersection. A 1,750 vehicle per hour per lane was assumed as the saturation flow value for through and turning lanes.
[2] The delay ranges shown are based on the 2000 Highway Capacity Manual (HCM)
LOS = Level of Service; mph = miles per hour

Table 2 - Level of Service Criteria Along Arterial Roadways					
LOS	8-Lane Divided	6-Lane Divided	4-Lane Divided	4-Lane Undivided	2-Lane Undivided
A	48,000	36,000	24,000	16,000	5,000
B	54,000	40,400	27,000	18,000	7,500
C	60,000	45,000	30,000	20,000	10,000
D	66,000	49,500	33,000	22,000	12,500
E	72,000	54,000	36,000	24,000	15,000
F	This condition represents system breakdown and does not have a specific relationship to service volumes.				

The values shown in the table are referenced from the City of Santa Clarita General Plan Circulation Element

ANALYSIS METHODOLOGY

The intersection analysis evaluated the operations of the study area intersections during a typical weekday for the AM and PM peak periods. The AM peak is defined as the time period between 7:00 and 9:00 AM. The PM peak is defined as the time period between 4:00 and 6:00 PM. Synchro 8 was used as the software program to evaluate the operations at unsignalized intersections.

REPORT ORGANIZATION

Following this section, Section II evaluates the existing roadway characteristics and traffic conditions surrounding the project area. Section III examines the project trip generation and distribution assumptions. Section IV analyzes the traffic for existing plus project conditions. Section V provides recommended mitigation measures. Section VII summarizes the report's findings and conclusions.

SECTION II - EXISTING CONDITIONS

This section of the traffic study is intended to assess the existing conditions of the roadways and intersections within the vicinity of the project to determine travel flow and/or delay difficulties, if any, that exist prior to adding the traffic generated by the proposed project. The existing conditions analysis establishes a base condition which is used to assess the other scenarios discussed in this report.

Darnell & Associates, Inc. (D&A) conducted a field review of the area surrounding the project in June 2016. The existing roadway geometrics are illustrated in Figure 3.

EXISTING ROADWAY CHARACTERISTICS

The key segments analyzed in the study area are identified below:

Magic Mountain Parkway: Magic Mountain Parkway is a six-lane divided roadway in the study area with painted medians and is classified as a major highway. The roadway generally runs in the east-west direction. Parking is restricted on both sides of the roadway and the posted speed limit is 50 miles per hour (mph). Based on the City's Circulation Element, an improvement to restripe the roadway from 6-lanes to 8-lanes.

Tourney Road: Tourney Road is a three-lane roadway with a center two-way left-turning lane in the study area and is classified as a secondary highway. The roadway generally runs in the north-south direction. Bicycle lanes and parking are provided on both sides of the roadway. There are no posted speed limit signs in the immediate vicinity of the project.

ROADWAY SEGMENT DAILY TRAFFIC

Daily traffic volume data were obtained along the study area roadway segments on Thursday, July 28, 2016. Figure 4 presents the existing conditions traffic volumes used in this analysis. Count summaries are included in Appendix A.

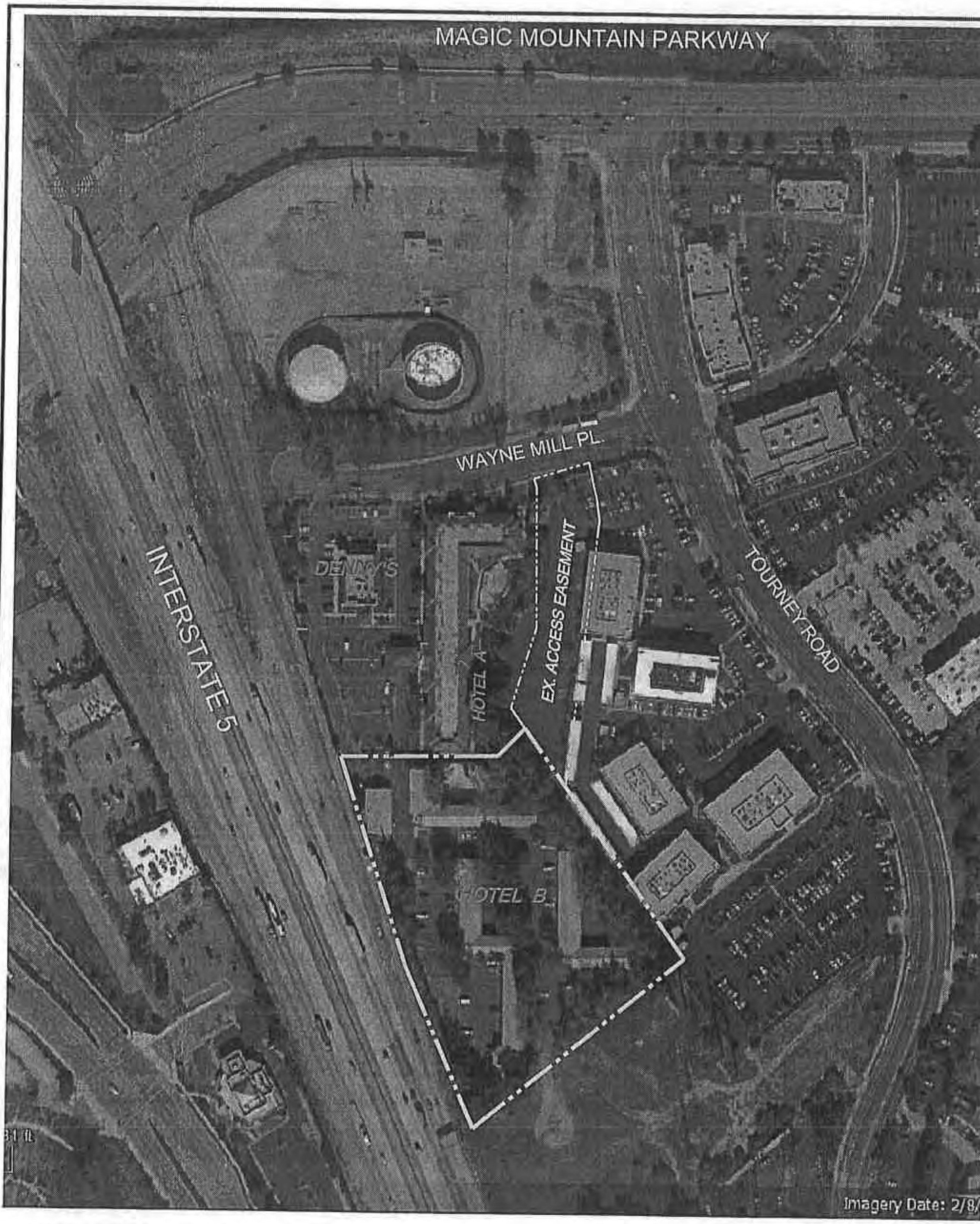
KEY INTERSECTIONS

Figure 3 provides intersection configurations and traffic control for the key intersections. The key intersections analyzed in the study area are identified below:

- The Old Road/Magic Mountain Parkway (signal);
- I-5 SB Ramps/Magic Mountain Parkway (signal);
- I-5 NB Ramps/Magic Mountain Parkway (signal);
- Tourney Road/Magic Mountain Parkway (signal);
- Tourney Road/Wayne Mills Place (two-way stopped control)

INTERSECTION TRAFFIC COUNTS

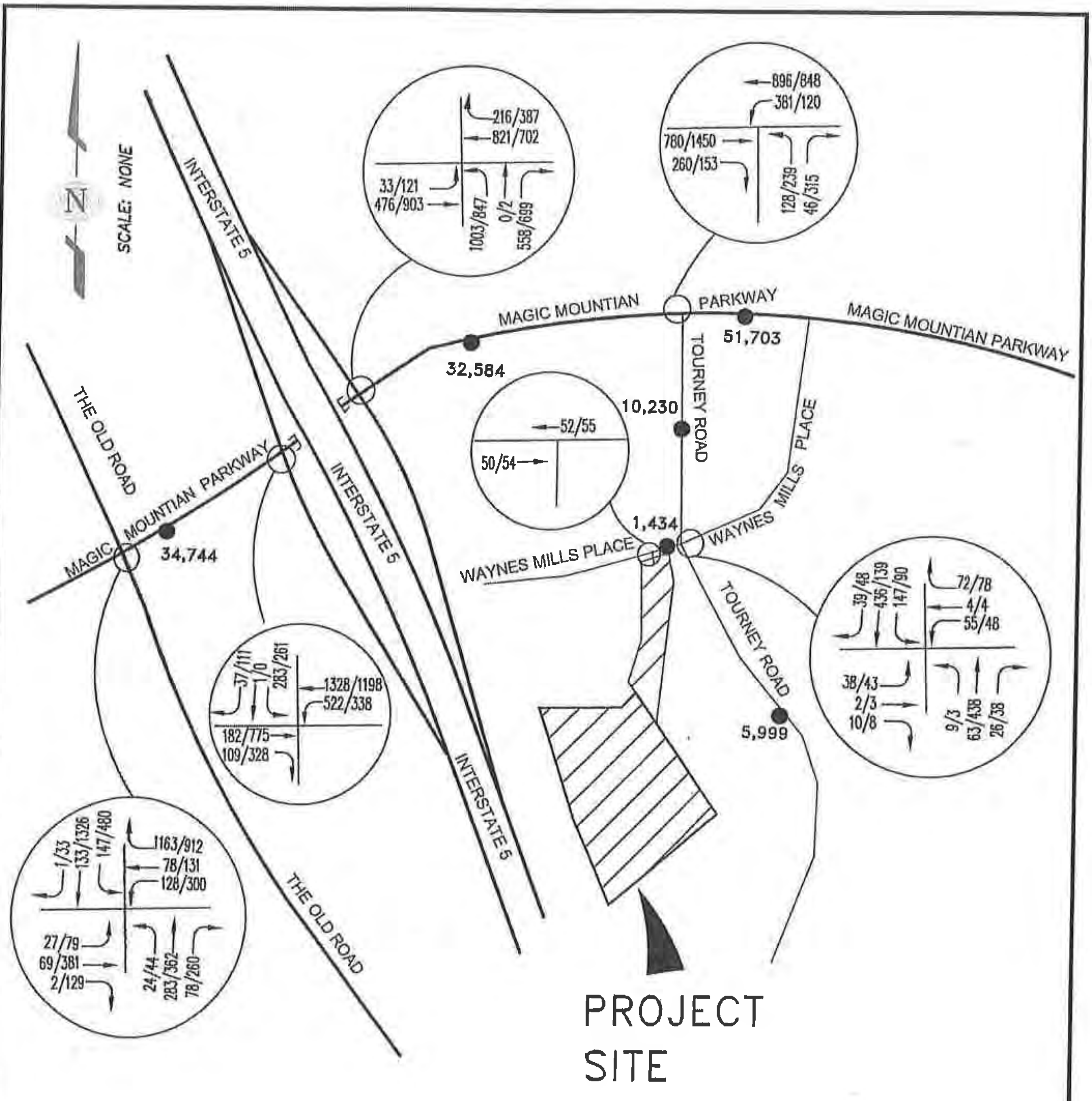
Peak-hour traffic volume data were obtained at the study area intersections on Thursday, July 28, 2016. Figure 4 presents the existing conditions traffic volumes used in this analysis. Count summaries are included in Appendix A.



BILL E. DARNELL
No. 22338
Exp. 9-30-17
CIVIL
REGISTERED PROFESSIONAL ENGINEER
STATE OF CALIFORNIA

Darnell & ASSOCIATES, INC.
2870 MERCURY STREET, SUITE 207A
SAN DIEGO, CA 92111
(619) 233-9373
DWG: 180605-AA DATE: SEPTEMBER 13, 2016 BY: DAB

FIGURE 3
EXISTING DEVELOPMENT CONDITIONS



LEGEND

→ – DIRECTION OF TRAVEL

XX/YY – AM/PM PEAK HOUR TRAFFIC VOLUMES

– SIGNAL

o| – STOP SIGN

REGISTERED PROFESSIONAL ENGINEER
BILL E. DARNELL
No. 22330
Exp. 9-30-17
CIVIL
STATE OF CALIFORNIA

Darnell & ASSOCIATES, INC.
2870 MERCURY STREET, SUITE 207A
SAN DIEGO, CA 92111
(619) 233-9373

DWG: 160605-AA DATE: September 15, 2016 BY: JAB

FIGURE 4

EXISTING TRAFFIC VOLUMES

EXISTING LEVEL OF SERVICE CONDITIONS

Roadway Segments

Table 3 summarizes the LOS along the roadway segments in the study area. As shown in the table, all roadway segments operate at LOS A except for the Magic Mountain Parkway segment between Tourney Road and Wayne Mills Place, which operates at LOS "E".

Table 2 - Existing Roadway Segment Level of Service Summary

Roadway Segment	Classification	Existing Number of Lanes	LOS "E" Capacity	ADT	v/c	LOS
Magic Mountain Pkwy	Major Arterial	6-Lane Divided	54,000			
The Old Rd to I-5 SB Ramps				34,744	0.64	A
I-5 NB Ramps to Tourney Road				32,584	0.60	A
Tourney Road to Wayne Mills Place				51,703	0.96	E
Tourney Rd	Secondary Highway	4-Lane Undivided	24,000			
Magic Mountain Pkwy to Wayne Mills Place				10,230	0.43	A
South of Wayne Mills Place				5,999	0.25	A

Volume on this segment was estimated. Capacity is based on the upper limits of LOS E per the City of Santa Clarita General Plan Circulation Element; ADT= Average Daily Traffic; LOS= Level of Service.

Intersections

Table 4 summarizes the LOS at the intersections in the study area. As shown in the table, all signalized intersections operate at LOS "A" during the peak periods. The unsignalized intersection of Tourney Road/Wayne Mills Place operates at LOS "D" or better during the peak periods.

Table 3 - Existing Intersection Level of Service Summary

#	Intersection	Traffic Control	Peak Hour	Existing Conditions	
				ICU/Delay (a)	LOS (b)
1	The Old Rd & Magic Mountain Pkwy	Signal	AM	0.196	A
			PM	0.470	A
2	I-5 SB Ramps & Magic Mountain Pkwy	Signal	AM	0.356	A
			PM	0.403	A
3	I-5 NB Ramps & Magic Mountain Pkwy	Signal	AM	0.493	A
			PM	0.510	A
4	Tourney Rd & Magic Mountain Pkwy	Signal	AM	0.465	A
			PM	0.530	A
5	Tourney Rd & Wayne Mills Pl	TWSC	AM	24.9	C
			PM	25.7	D
6	Project Dwy & Wayne Mills Pl	OWSC	AM	DNE	
			PM		

DNE: Does not exist
(a) ICU's are reported at signalized intersections. Delays are reported as the worst movement at unsignalized intersections.
(b) LOS calculations are based on the methodology outlined in the 2000 Highway Capacity Manual (HCM) and performed using Synchro 8, TWSC = Two Way Stop Control, OWSC = One Way Stop Control.

A copy of the analysis worksheets for conditions can be found in Appendix B.

SECTION III - PROJECT RELATED CONDITIONS

TRIP GENERATION

Trip generation rates published by the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition* were applied to the existing and proposed use in order to determine the traffic generation characteristics of the site. The existing site contains a 120-Room Best Western Hotel. The project consists of a 182-Room Springhill Suites/Residence Inn and a 108-Room Holiday Inn Express, which results in a net increase of 170 hotel rooms. Upon reviewing the various land uses contained in the *ITE Trip Generation Manual*, land use code of 312 (Business Hotel) was the most appropriate and applied to the project.

Table 4 summarizes the weekday trip generation. As shown in the table, the project is forecasted to generate a net increase of 1,237 daily trips with 99 AM peak-hour trips and 105 PM peak-hour trips.

Table 4 - Trip Generation Rates and Calculations Summary

Trip Generation Rates

Land Use	Daily	AM Peak Hour			PM Peak Hour		
		Rate	% In	% Out	Rate	% In	% Out
Business Hotel	7.27 trips/rooms	0.58/Room	59%	41%	0.62/Room	60%	40%

Trip Generation

Land Use	Total No. of Units	Daily	AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out
Existing Uses								
Best Western	120 rooms	873	70	42	28	75	45	30
Proposed Uses								
Springhill Suites/Residence Inn	182 rooms	1,324	106	63	43	113	68	45
Holiday Inn Express	108 rooms	786	63	38	25	67	41	26
Subtotal (Proposed – Existing)		**2,110**	**169**	**101**	**68**	**180**	**109**	**71**
Net New Trips		**1,237**	**99**	**59**	**40**	**105**	**64**	**41**

Trip Generation Rates are based on rates published by the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition.*

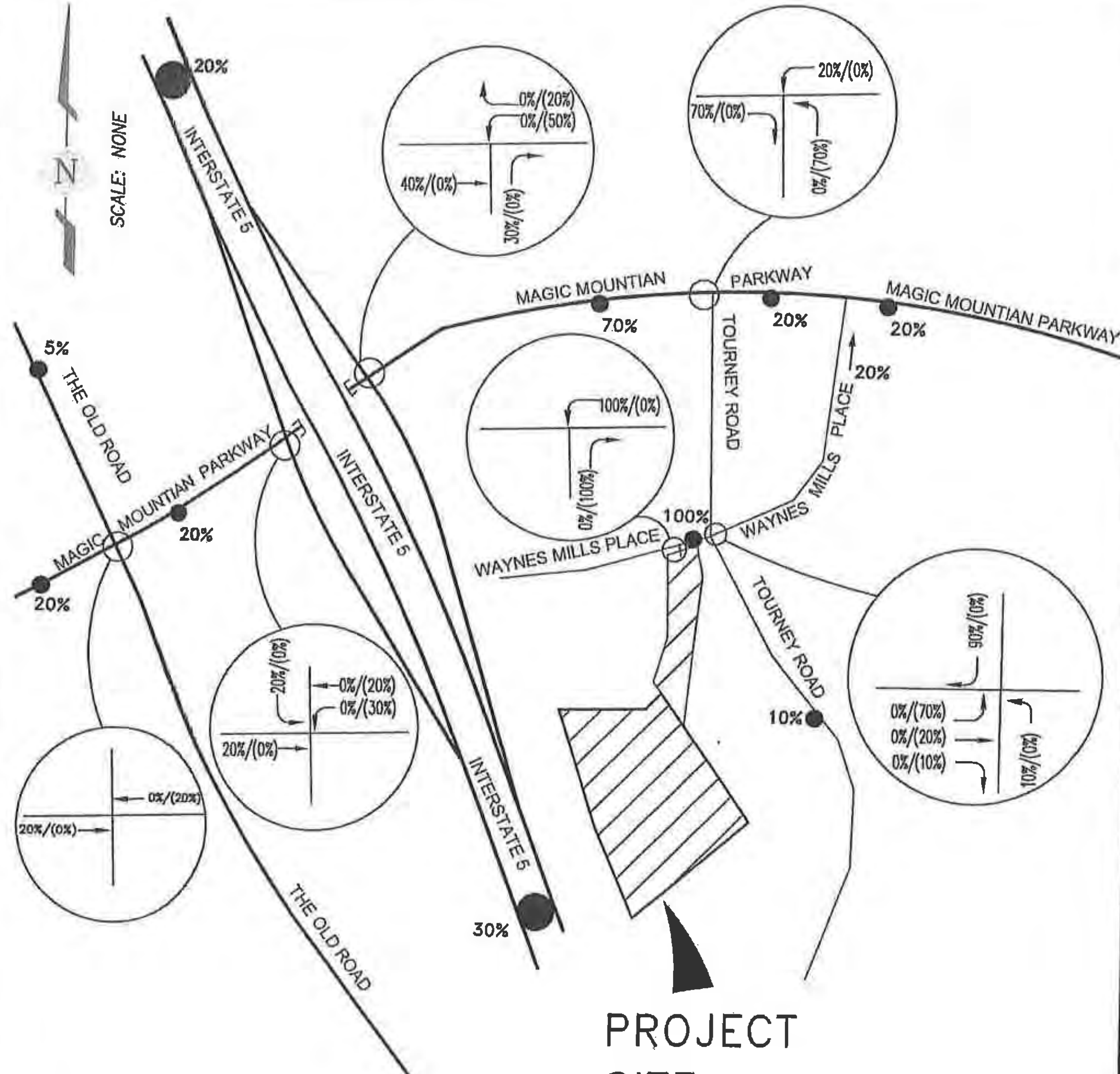
TRIP DISTRIBUTION/TRIP ASSIGNMENT

Based on existing travel patterns in the study area and on logical connections to regional facilities, the following list shows the assumed project trip distribution for the proposed project:

- 20 percent to/from the north via I-5;
- 40 percent to/from the south;
    - 30 percent via I-5;
    - 10 percent via Tourney Road;
- 20 percent to/from the east via Magic Mountain Parkway; and
- 20 percent to/from the west via Magic Mountain Parkway.

Figure 5 displays the assumed project trip distribution through the study intersections. Based on the project trip generation and distribution, the peak-hour trips were assigned to the intersections in the study area. Figure 6 illustrates the weekday project trip assignment.

The impacts associated with the addition of project traffic are discussed in the following section, Section IV.



LEGEND

→ – DIRECTION OF TRAVEL

XX% – TRIP DISTRIBUTION PERCENTAGE

REGISTERED PROFESSIONAL ENGINEER BILL E. DARNELL No. 22338 Exp. 9-30-17 CIVIL STATE OF CALIFORNIA

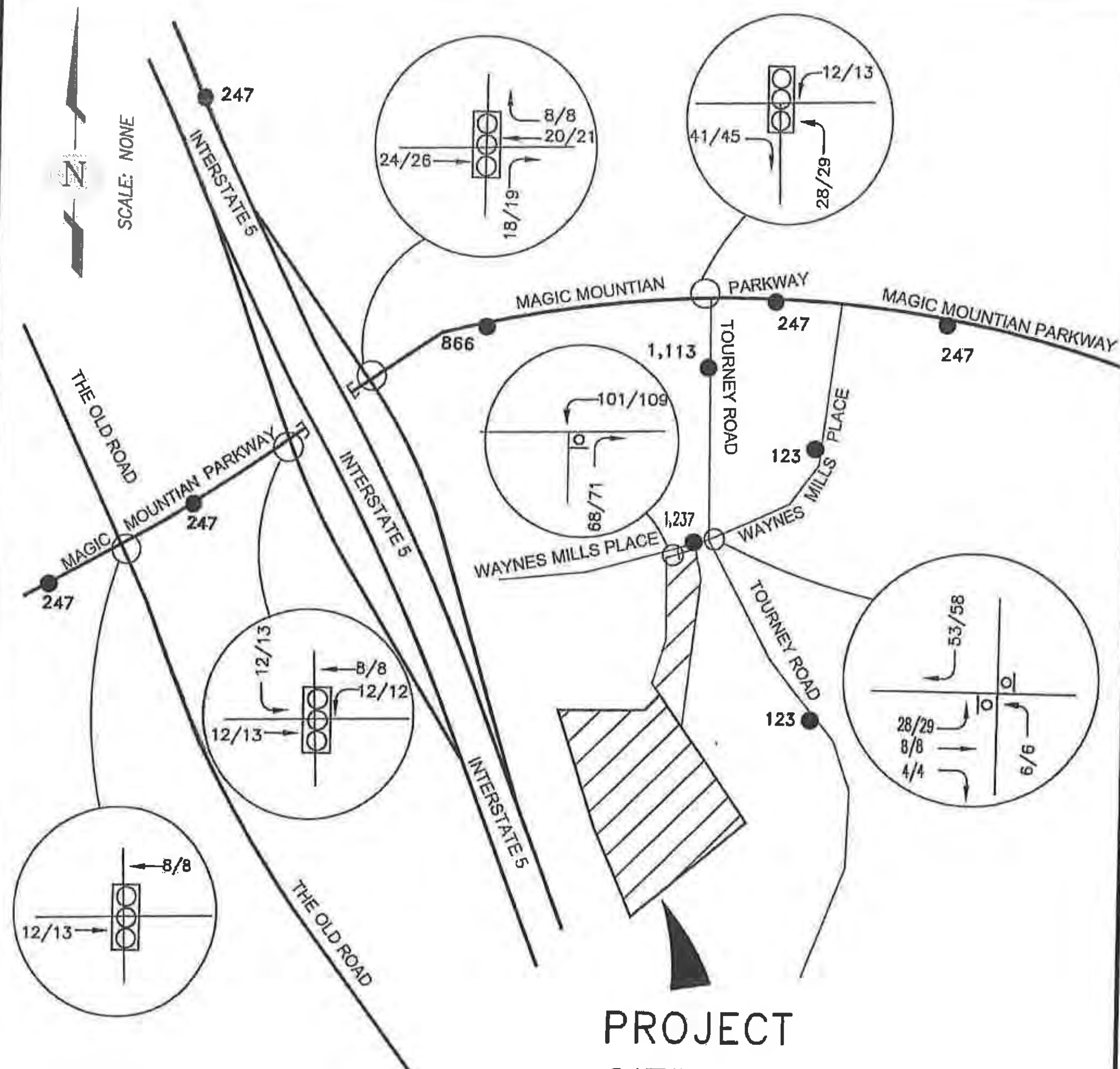
Darnell & ASSOCIATES, INC.

2870 MERCURY STREET, SUITE 207A
SAN DIEGO, CA 92111
(619) 233-9373

DWG: 160605-AA DATE: September 15, 2016 BY: JAB

FIGURE 5

PROJECT TRIP DISTRIBUTION



LEGEND

→ – DIRECTION OF TRAVEL

XX/YY – AM/PM PEAK HOUR TRAFFIC VOLUMES

– SIGNAL

o| – STOP SIGN

REGISTERED PROFESSIONAL ENGINEER BILL E. DARNELL No. 22330 Exp. 6-30-17 CIVIL STATE OF CALIFORNIA

Darnell & ASSOCIATES, INC.
2870 MERCURY STREET, SUITE 207A
SAN DIEGO, CA 92111
(619) 233-9373

DWG: 160605-AA DATE: September 15, 2016 BY: JAB

FIGURE 6

PROJECT TRAFFIC

SECTION IV – IMPACTS

This section describes the Level of Service analyses for the study area intersections and roadway segments with the addition of project traffic to Existing Conditions.

EXISTING PLUS PROJECT CONDITIONS

The daily and peak hour turn volumes for existing plus project conditions are illustrated in Figure 7.

Roadway Segments

The roadway segments were analyzed with the traffic generated from the proposed project added to existing traffic volumes. Table 5 displays the Level of Service Analysis results for the roadway segments under the Existing Plus Project scenario. As shown in the table, all roadway segments are expected to operate at LOS "A" with the addition of the project except for the segment between Tourney Road and Wayne Mills Place along Magic Mountain Parkway. This segment will continue to operate at LOS "E". However, with the addition of the project traffic, the increase in v/c ratio does not exceed the significance threshold. As a result, no additional roadway improvements are required and/or recommended.

Intersections

The intersections were analyzed with the traffic generated from the proposed project added to existing traffic volumes. Table 6 displays the Level of Service Analysis results for the study intersections under the Existing Plus Project scenario. As shown in the table, all intersections, including the project driveway, are expected to operate at LOS "D" or better with the addition of the project traffic. The increase in delay does not exceed the significance thresholds. As a result, no additional intersection improvements are required and/or recommended.

A copy of the ICU/LOS worksheets for existing plus project conditions can be found in Appendix C.

2017 OPENING DAY PLUS PROJECT CONDITIONS

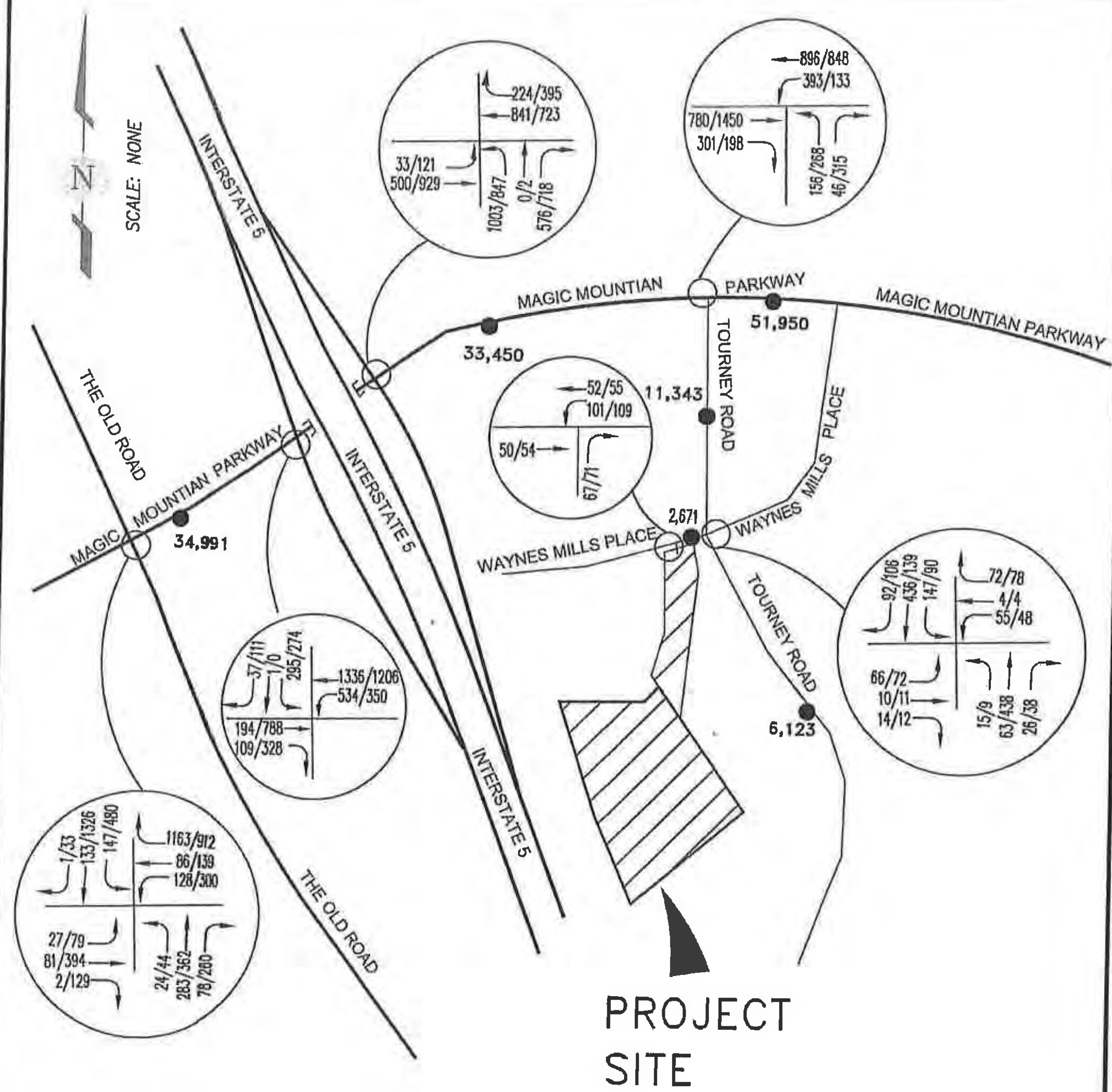
Opening Day 2017 traffic conditions are estimated by adding 3% ambient growth to existing traffic volumes plus project traffic. Figure 8 presents the 2017 Opening Day volumes and Figure 9 presents the Opening Day plus project conditions.

Roadway Segments

The roadway segments were analyzed with the traffic generated from the proposed project added to existing traffic volumes plus 3% ambient growth. Table 7 displays the Level of Service Analysis results for the roadway segments under the Existing Plus Project scenario. As shown in the table, all roadway segments are expected to operate at LOS "A" with the addition of the project except for the segment between Tourney Road and Wayne Mills Place along Magic Mountain Parkway. This segment will continue to operate at LOS "E". However, with the addition of the project traffic, the increase in v/c ratio does not exceed the significance threshold. As a result, no additional roadway improvements are required and/or recommended.

Intersections

The intersections were analyzed with the traffic generated from the proposed project added to existing traffic volumes plus 3% ambient growth. Table 8 displays the Level of Service Analysis results for the study intersections under the Existing Plus Project scenario. As shown in the table, all intersections, including the project driveway, are expected to operate at LOS "D" or better with the addition of the project traffic. The increase in delay does not exceed the significance thresholds. As a result, no additional intersection improvements are required and/or recommended.



LEGEND

→ – DIRECTION OF TRAVEL

XX/YY – AM/PM PEAK HOUR TRAFFIC VOLUMES

– SIGNAL

o| – STOP SIGN

PROFESSIONAL ENGINEER, BILL E. DARNELL, No. 22338, Exp 0-30-17, CIVIL, STATE OF CALIFORNIA

Darnell & ASSOCIATES, INC.
2870 MERCURY STREET, SUITE 207A
SAN DIEGO, CA 92111
(619) 233-9373

DWG: 160805-AA DATE: September 15, 2016 BY: JAB

FIGURE 7
EXISTING PLUS PROJECT TRAFFIC VOLUMES

Table 5 - Existing Plus Project Roadway Segment Level of Service Summary

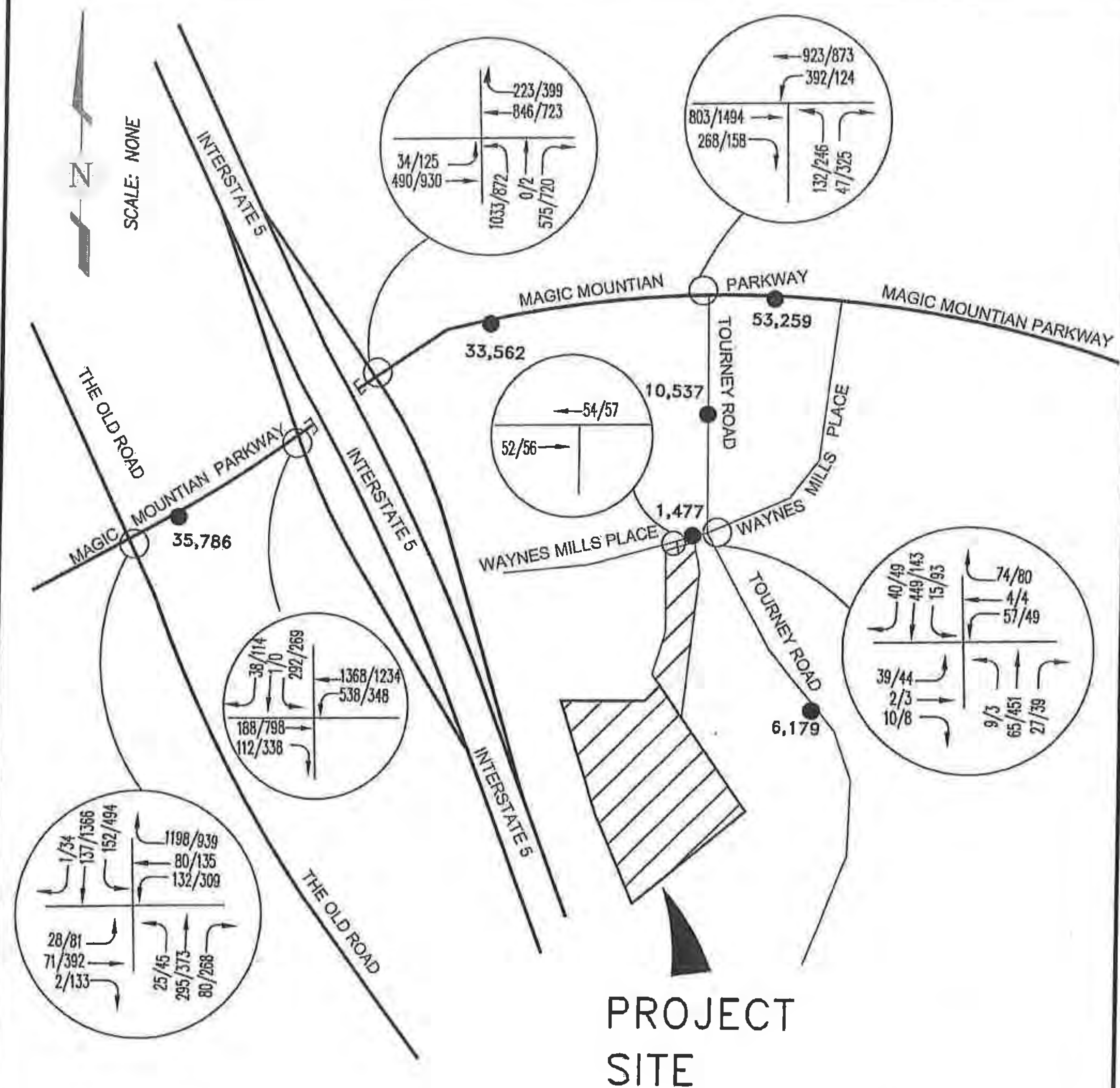
Roadway Segment	Classification	Existing Number of Lanes	LOS "E" Capacity	Existing			Existing Plus Project			
				ADT	v/c	LOS	ADT	v/c	LOS	Δ in v/c
Magic Mountain Pkwy										
The Old Rd to I-5 SB Ramps	Major Arterial	6-Lane Divided	54,000	34,744	0.64	A	34,991	0.65	A	0.00
I-5 NB Ramps to Tourney Road				32,584	0.60	A	33,450	0.62	A	0.02
Tourney Road to Wayne Mills Place				**51,703**	**0.96**	**E**	**51,950**	**0.96**	**E**	**0.00**
Tourney Road										
Magic Mountain Pkwy to Wayne Mills Place	Secondary Highway	4-Lane Undivided	24,000	10,230	0.43	A	11,343	0.47	A	0.05
South of Wayne Mills Place				5,999	0.25	A	6,123	0.26	A	0.01
Wayne Mills Place										
West of Tourney Road	Local	2-Lane	5,000	1,434	0.29	A	2,671	0.53	A	0.24

Volume on this segment was estimated. Capacity is based on the upper limits of LOS E per the City of Santa Clarita General Plan Circulation Element; ADT= Average Daily Traffic; LOS= Level of Service.

Table 6 - Existing Plus Project Intersection Level of Service Summary

#	Intersection	Traffic Control	Peak Hour	Existing Conditions		Existing Plus Project		Δ in ICU/Delay
				ICU/Delay (a)	LOS (b)	ICU/Delay (a)	LOS (b)	
1	The Old Road & Magic Mountain Pkwy	Signal	AM	0.196	A	0.198	A	0.002
			PM	0.470	A	0.475	A	0.005
2	I-5 SB Ramps & Magic Mountain Pkwy	Signal	AM	0.356	A	0.362	A	0.006
			PM	0.403	A	0.415	A	0.012
3	I-5 NB Ramps & Magic Mountain Pkwy	Signal	AM	0.493	A	0.496	A	0.003
			PM	0.510	A	0.523	A	0.013
4	Tourney Road & Magic Mountain Pkwy	Signal	AM	0.465	A	0.480	A	0.015
			PM	0.530	A	0.536	A	0.006
5	Tourney Road & Wayne Mills Place	TWSC	AM	5.4	A	6.8	A	2.4
			PM	5.0	A	6.4	A	1.4
6	Project Driveway & Wayne Mills Place	OWSC	AM	DNE		8.8	A	5.0
			PM			8.9	A	5.0

Notes:
DNE = Does not exist, TWSC = Two Way Stop Control, OWSC = One Way Stop Control.
a. ICU is reported at signalized intersections. .
b. LOS calculations are based on the methodology outlined in the *2000 Highway Capacity Manual* (HCM).
Delays at unsignalized intersections are reported based on intersection delay using Synchro 8 – Intersection Capacity Software



LEGEND

— DIRECTION OF TRAVEL

XX/YY – AM/PM PEAK HOUR TRAFFIC VOLUMES

– SIGNAL

– STOP SIGN

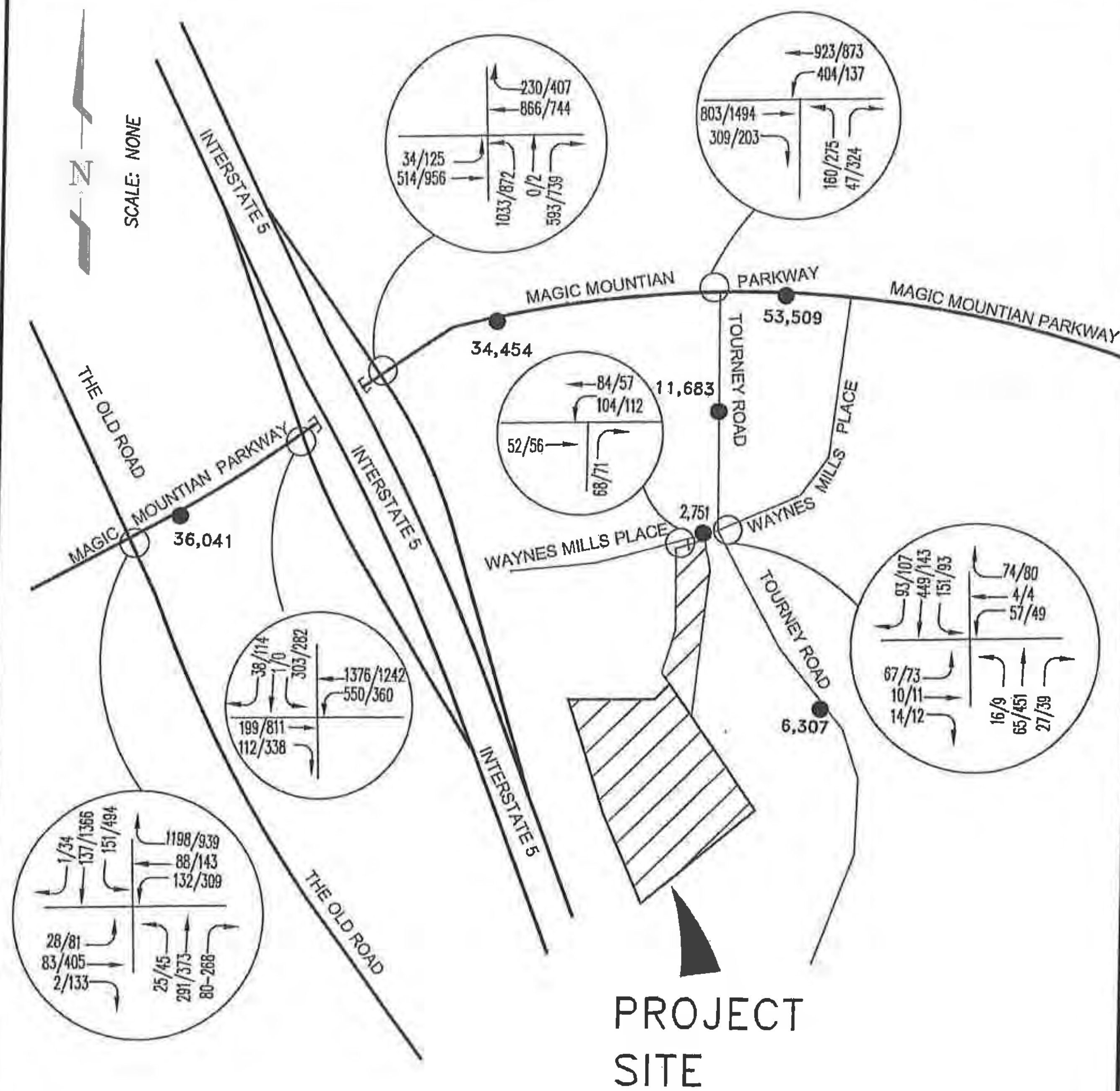
REGISTERED PROFESSIONAL ENGINEER BILL E. DARNELL No. 22338 Exp. 6-30-17 CIVIL STATE OF CALIFORNIA

Darnell & ASSOCIATES, INC.
2870 MERCURY STREET, SUITE 207A
SAN DIEGO, CA 92111
(619) 233-9373

DWG: 160605-AA DATE: September 15, 2016 BY: JAB

FIGURE 8

2017 OPENING DAY TRAFFIC VOLUMES



LEGEND

—— – DIRECTION OF TRAVEL

XX/YY – AM/PM PEAK HOUR TRAFFIC VOLUMES

– SIGNAL

o| – STOP SIGN

BILL E. DARNELL No. 22336 Exp. 9-30-17 CIVIL REGISTERED PROFESSIONAL ENGINEER STATE OF CALIFORNIA

Darnell & ASSOCIATES, INC.
2870 MERCURY STREET, SUITE 207A
SAN DIEGO, CA 92111
(619) 233-9373

DWG: 160605–AA DATE: September 15, 2016 BY: JAB

FIGURE 9

2017 PLUS OPENING DAY PLUS EXISTING PLUS PROJECT TRAFFIC VOLUMES

Table 7 –Existing Plus Project Plus 2017 Opening Day Roadway Segment Level of Service Summary

Roadway Segment	Classification	Existing Number of Lanes	LOS "E" Capacity	Existing Plus Project			Existing Plus Project Plus Ambient Growth			Δ in v/c
				ADT	v/c	LOS	ADT	v/c	LOS	
Magic Mountain Pkwy										
The Old Rd to I-5 SB Ramps	Major Arterial	6-Lane Divided	54,000	34,991	0.65	A	36,041	0.67	B	0.02
I-5 NB Ramps to Tourney Road				33,450	0.62	B	34,454	0.64	B	0.02
Tourney Road to Wayne Mills Place				**51,950**	**0.96**	**E**	**53,509**	**0.99**	**E**	**0.03**
Tourney Road										
Magic Mountain Pkwy to Wayne Mills Place	Secondary Highway	4-Lane Undivided	24,000	11,343	0.47	A	11,683	0.49	A	0.02
South of Wayne Mills Place				6,123	0.26	A	6,307	0.26	A	0.00
Wayne Mills Place										
West of Tourney Road	Local	2-Lane	5,000	2,671	0.53	A	2,751	0.28	A	0.01

Volume on this segment was estimated. Capacity is based on the upper limits of LOS E per the City of Santa Clarita General Plan Circulation Element; ADT= Average Daily Traffic; LOS= Level of Service.

Table 8 - Existing Plus Project Plus 2017 Opening Day Intersection Level of Service Summary

#	Intersection	Traffic Control	Peak Hour	Existing Conditions		Existing Plus Project Conditions		Existing Plus Project Plus Ambient Growth		Δ in ICU/Delay
				ICU/Delay (a)	LOS (b)	ICU/Delay (a)	LOS (b)	ICU/Delay (a)	LOS (b)	
1	The Old Road & Magic Mountain Pkwy	Signal	AM	0.196	A	0.198	A	0.202	A	0.004
			PM	0.470	A	0.475	A	0.490	A	0.015
2	I-5 SB Ramps & Magic Mountain Pkwy	Signal	AM	0.356	A	0.362	A	0.371	A	0.006
			PM	0.403	A	0.415	A	0.426	A	0.012
3	I-5 NB Ramps & Magic Mountain Pkwy	Signal	AM	0.493	A	0.496	A	0.510	A	0.003
			PM	0.510	A	0.523	A	0.543	A	0.013
4	Tourney Road & Magic Mountain Pkwy	Signal	AM	0.465	A	0.480	A	0.492	A	0.015
			PM	0.530	A	0.536	A	0.546	A	0.006
5	Tourney Road & Wayne Mills Place	TWSC	AM	5.4	A	6.8	A	7.1	A	0.3
			PM	5.0	A	6.4	A	6.7	A	0.3
6	Project Driveway & Wayne Mills Place	OWSC	AM	DNE		5.0	A	4.9	A	0.0
			PM			5.0	A	5.0	A	0.0

Notes:

DNE = Does not exist, TWSC = Two Way Stop Control, OWSC = One Way Stop Control.

(a) ICU is reported at signalized intersections.

(b) LOS calculations are based on the methodology outlined in the *2000 Highway Capacity Manual* (HCM).
Delays at unsignalized intersections are reported based on intersection delay using Synchro 8 – Intersection Capacity Software

SECTION V - SUMMARY OF FINDINGS AND CONCLUSIONS

The following list provides a summary of the key findings for the project:

- The project is forecasted to generate a net increase of approximately 1,237 daily trips with 99 AM peak-hour trips and 105 PM peak-hour trips.

- All study area intersections, including the project driveway, are expected to operate at an acceptable LOS "D" or better during the AM and PM peak hours with the addition of project traffic.

- All study area roadway segments are expected to operate at an acceptable LOS "A" or better, except for the segment of Magic Mountain Parkway between Tourney Road and Wayne Mills Place, which is currently operating at LOS "E" and will continue to operate at LOS "E" with the addition of project traffic.,

- The increase in project traffic at the study area intersections and roadway segments do not result in a significant impact and therefore no additional improvements are required and/or recommended.

APPENDIX A

- 24-Hour Segment Counts
- AM/PM Peak Hour Turn Counts

Prepared by NDS/ATD

VOLUME

Wayne Mills Pl E/O Driveway #3

Day: Monday
Date: 7/4/2016

City: Santa Clarita
Project #: CA16_5446_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	734	700	1,434

AM Period	NB	SB	EB		WB		TOTAL	
00:00			7		15		22	
00:15			9		10		19	
00:30			5		5		10	
00:45			3	24	3	33	6	57
01:00			10		3		13	
01:15			2		5		7	
01:30			5		5		10	
01:45			4	21	1	14	5	35
02:00			5		2		7	
02:15			0		1		1	
02:30			1		1		2	
02:45			0	6	1	5	1	11
03:00			1		2		3	
03:15			2		0		2	
03:30			1		1		2	
03:45			0	4	0	3	0	7
04:00			4		0		4	
04:15			0		0		0	
04:30			1		1		2	
04:45			0	5	5	6	5	11
05:00			2		2		4	
05:15			2		5		7	
05:30			3		2		5	
05:45			3	10	4	13	7	23
06:00			4		3		7	
06:15			6		4		10	
06:30			4		6		10	
06:45			3	17	7	20	10	37
07:00			7		2		9	
07:15			2		12		14	
07:30			7		10		17	
07:45			8	24	17	41	25	65
08:00			9		3		12	
08:15			4		9		13	
08:30			11		8		19	
08:45			9	33	8	28	17	61
09:00			19		16		35	
09:15			17		8		25	
09:30			21		15		36	
09:45			23	80	17	56	40	136
10:00			27		10		37	
10:15			26		10		36	
10:30			22		13		35	
10:45			21	96	11	44	32	140
11:00			20		12		32	
11:15			15		7		22	
11:30			23		5		28	
11:45			11	69	8	32	19	101
TOTALS				389		295		684
SPLIT %				56.9%		43.1%		47.7%

PM Period	NB	SB	EB		WB		TOTAL	
12:00			13		6		19	
12:15			11		11		22	
12:30			11		9		20	
12:45			12	47	10	36	22	83
13:00			13		5		18	
13:15			8		8		16	
13:30			6		1		7	
13:45			8	35	5	19	13	54
14:00			12		10		22	
14:15			8		3		11	
14:30			7		5		12	
14:45			4	31	13	31	17	62
15:00			6		4		10	
15:15			4		3		7	
15:30			6		13		19	
15:45			8	24	6	26	14	50
16:00			9		8		17	
16:15			10		10		20	
16:30			7		4		11	
16:45			9	35	6	28	15	63
17:00			5		6		11	
17:15			2		10		12	
17:30			6		9		15	
17:45			4	17	4	29	8	46
18:00			5		2		7	
18:15			7		9		16	
18:30			10		14		24	
18:45			2	24	9	34	11	58
19:00			6		8		14	
19:15			10		3		13	
19:30			4		4		8	
19:45			7	27	7	22	14	49
20:00			3		8		11	
20:15			7		13		20	
20:30			8		10		18	
20:45			2	20	9	40	11	60
21:00			11		15		26	
21:15			8		7		15	
21:30			3		9		12	
21:45			7	29	11	42	18	71
22:00			7		13		20	
22:15			6		17		23	
22:30			4		14		18	
22:45			9	26	20	64	29	90
23:00			8		9		17	
23:15			7		9		16	
23:30			10		8		18	
23:45			5	30	8	34	13	64
TOTALS				345		405		750
SPLIT %				46.0%		54.0%		52.3%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	734	700	1,434

	EB	WB	TOTAL		EB	WB	TOTAL
AM Peak Hour	09:45	09:00	09:30	PM Peak Hour	12:00	22:00	22:00
AM Pk Volume	98	56	149	PM Pk Volume	47	64	90
Pk Hr Factor	0.907	0.824	0.931	Pk Hr Factor	0.904	0.800	0.776
7 - 9 Volume	57	69	126	4 - 6 Volume	52	57	109
7 - 9 Peak Hour	08:00	07:15	07:45	4 - 6 Peak Hour	16:00	16:45	16:00
7 - 9 Pk Volume	33	42	69	4 - 6 Pk Volume	35	31	63
Pk Hr Factor	0.750	0.618	0.690	Pk Hr Factor	0.875	0.775	0.788

Existing AM/PM Peak Hour Traffic Counts

Prepared by NDS/ATD

VOLUME

Tourney Rd Bet. Magic Mountain Pkwy & Wayne Mills Pl

Day: Thursday
Date: 7/28/2016

City: Santa Clarita
Project #: CA16_5500_001

DAILY TOTALS	NB	SB	EB	WB	Total
	5,001	5,229	0	0	10,230

AM Period	NB		SB		EB		WB		TOTAL	
00:00	13		7						20	
00:15	9		5						14	
00:30	3		5						8	
00:45	6	31	5	22					11	53
01:00	4		4						8	
01:15	5		5						10	
01:30	4		3						7	
01:45	1	14	1	13					2	27
02:00	6		3						9	
02:15	2		11						13	
02:30	2		5						7	
02:45	2	12	2	21					4	33
03:00	5		1						6	
03:15	3		0						3	
03:30	8		4						12	
03:45	3	19	4	9					7	28
04:00	0		3						3	
04:15	3		6						9	
04:30	8		6						14	
04:45	7	18	11	26					18	44
05:00	11		13						24	
05:15	25		23						48	
05:30	23		15						38	
05:45	24	83	17	68					41	151
06:00	29		24						53	
06:15	21		40						61	
06:30	43		34						77	
06:45	31	124	77	175					108	299
07:00	33		55						88	
07:15	39		97						136	
07:30	38		118						156	
07:45	40	150	155	425					195	575
08:00	38		153						191	
08:15	55		177						232	
08:30	41		138						179	
08:45	48	182	145	613					193	795
09:00	70		116						186	
09:15	82		88						170	
09:30	85		99						184	
09:45	75	312	102	405					177	717
10:00	86		120						206	
10:15	82		99						181	
10:30	102		72						174	
10:45	72	342	99	390					171	732
11:00	101		84						185	
11:15	86		91						177	
11:30	125		91						216	
11:45	110	422	89	355					199	777
TOTALS		1709		2522						4231
SPLIT %		40.4%		59.6%						41.4%

PM Period	NB		SB		EB		WB		TOTAL	
12:00	137		76						213	
12:15	132		90						222	
12:30	104		96						200	
12:45	116	489	115	377					231	866
13:00	78		135						213	
13:15	85		109						194	
13:30	84		99						183	
13:45	91	338	116	459					207	797
14:00	78		76						154	
14:15	78		88						166	
14:30	78		102						180	
14:45	91	325	100	366					191	691
15:00	91		85						176	
15:15	81		87						168	
15:30	101		69						170	
15:45	83	356	71	312					154	668
16:00	105		85						190	
16:15	101		78						179	
16:30	137		60						197	
16:45	136	479	73	296					209	775
17:00	182		66						248	
17:15	95		69						164	
17:30	127		55						182	
17:45	94	498	46	236					140	734
18:00	95		51						146	
18:15	57		60						117	
18:30	63		48						111	
18:45	61	276	38	197					99	473
19:00	40		34						74	
19:15	41		33						74	
19:30	45		34						79	
19:45	37	163	30	131					67	294
20:00	41		31						72	
20:15	36		35						71	
20:30	39		29						68	
20:45	21	137	24	119					45	256
21:00	50		33						83	
21:15	20		16						36	
21:30	25		30						55	
21:45	27	122	30	109					57	231
22:00	22		18						40	
22:15	16		23						39	
22:30	14		11						25	
22:45	9	61	10	62					19	123
23:00	15		13						28	
23:15	13		6						19	
23:30	11		9						20	
23:45	9	48	15	43					24	91
TOTALS		3292		2707						5999
SPLIT %		54.9%		45.1%						58.6%

DAILY TOTALS	NB	SB	EB	WB	Total
	5,001	5,229	0	0	10,230

	NB	SB	EB	WB	TOTAL
AM Peak Hour	11:30	07:45			11:30
AM Pk Volume	504	623			850
Pk Hr Factor	0.920	0.880			0.957
7 - 9 Volume	332	1038	0	0	1370
7 - 9 Peak Hour	08:00	07:45			07:45
7 - 9 Pk Volume	182	623	0	0	797
Pk Hr Factor	0.827	0.880	0.000	0.000	0.859

	NB	SB	EB	WB	TOTAL
PM Peak Hour	16:15	13:00			12:00
PM Pk Volume	556	459			866
Pk Hr Factor	0.764	0.850			0.937
4 - 6 Volume	977	532	0	0	1509
4 - 6 Peak Hour	16:15	16:00			16:15
4 - 6 Pk Volume	556	296	0	0	833
Pk Hr Factor	0.764	0.871	0.000	0.000	0.840

Prepared by NDS/ATD

VOLUME

Tourney Rd S/O Wayne Mills Pl

Day: Thursday
Date: 7/28/2016

City: Santa Clarita
Project #: CA16_5500_002

DAILY TOTALS	NB	SB	EB	WB	Total
	2,940	3,059	0	0	5,999

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	12		6				18		12:00	42		53				95	
00:15	4		8				12		12:15	47		53				100	
00:30	10		5				15		12:30	42		56				98	
00:45	6	32	3	22			9	54	12:45	33	164	49	211			82	375
01:00	3		6				9		13:00	49		48				97	
01:15	3		3				6		13:15	40		65				105	
01:30	4		6				10		13:30	50		58				108	
01:45	5	15	4	19			9	34	13:45	48	187	37	208			85	395
02:00	7		8				15		14:00	44		42				86	
02:15	8		4				12		14:15	30		43				73	
02:30	5		2				7		14:30	50		45				95	
02:45	5	25	3	17			8	42	14:45	46	170	40	170			86	340
03:00	5		2				7		15:00	43		53				96	
03:15	1		6				7		15:15	45		51				96	
03:30	5		8				13		15:30	41		34				75	
03:45	5	16	3	19			8	35	15:45	45	174	47	185			92	359
04:00	8		7				15		16:00	41		39				80	
04:15	9		13				22		16:15	45		41				86	
04:30	13		4				17		16:30	50		40				90	
04:45	16	46	8	32			24	78	16:45	49	185	54	174			103	359
05:00	14		10				24		17:00	54		43				97	
05:15	21		13				34		17:15	50		61				111	
05:30	26		9				35		17:30	65		55				120	
05:45	19	80	25	57			44	137	17:45	51	220	72	231			123	451
06:00	27		21				48		18:00	67		41				108	
06:15	29		26				55		18:15	51		44				95	
06:30	29		26				55		18:30	50		45				95	
06:45	25	110	39	112			64	222	18:45	50	218	37	167			87	385
07:00	31		25				56		19:00	45		53				98	
07:15	30		45				75		19:15	43		45				88	
07:30	42		44				86		19:30	33		52				85	
07:45	32	135	25	139			57	274	19:45	36	157	54	204			90	361
08:00	35		36				71		20:00	41		48				89	
08:15	28		24				52		20:15	37		49				86	
08:30	32		31				63		20:30	48		46				94	
08:45	35	130	23	114			58	244	20:45	36	162	57	200			93	362
09:00	30		36				66		21:00	40		38				78	
09:15	38		33				71		21:15	42		36				78	
09:30	35		37				72		21:30	30		29				59	
09:45	45	148	34	140			79	288	21:45	26	138	27	130			53	268
10:00	22		48				70		22:00	21		27				48	
10:15	34		34				68		22:15	22		21				43	
10:30	40		40				80		22:30	16		12				28	
10:45	42	138	40	162			82	300	22:45	15	74	23	83			38	157
11:00	43		39				82		23:00	17		26				43	
11:15	35		38				73		23:15	17		11				28	
11:30	34		58				92		23:30	14		22				36	
11:45	48	160	57	192			105	352	23:45	8	56	12	71			20	127
TOTALS	1035		1025					2060	TOTALS	1905		2034					3939
SPLIT %	50.2%		49.8%					34.3%	SPLIT %	48.4%		51.6%					65.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	2,940	3,059	0	0	5,999

	NB	SB	EB	WB	TOTAL		NB	SB	EB	WB	TOTAL
AM Peak Hour	11:45	11:30			11:45	PM Peak Hour	17:30	17:00			17:15
AM Pk Volume	179	221			398	PM Pk Volume	234	231			462
Pk Hr Factor	0.932	0.953			0.948	Pk Hr Factor	0.873	0.802			0.939
7 - 9 Volume	265	253	0	0	518	4 - 6 Volume	405	405	0	0	810
7 - 9 Peak Hour	07:15	07:15			07:15	4 - 6 Peak Hour	17:00	17:00			17:00
7 - 9 Pk Volume	139	150	0	0	289	4 - 6 Pk Volume	220	231	0	0	451
Pk Hr Factor	0.827	0.833	0.000	0.000	0.840	Pk Hr Factor	0.846	0.802	0.000	0.000	0.917

Prepared by NDS/ATD

VOLUME

Magic Mountain Pkwy Bet. I-5 NB Ramps & Tourney Rd

Day: Thursday
Date: 7/28/2016

City: Santa Clarita
Project #: CA16_5500_003

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	16,525	16,059	32,584

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			50		34		84		12:00			263		227		490	
00:15			34		28		62		12:15			248		293		541	
00:30			25		36		61		12:30			261		282		543	
00:45			19	128	20	118	39	246	12:45			240	1012	249	1051	489	2063
01:00			29		21		50		13:00			265		286		551	
01:15			28		14		42		13:15			249		273		522	
01:30			22		12		34		13:30			213		245		458	
01:45			17	96	12	59	29	155	13:45			200	927	238	1042	438	1969
02:00			30		13		43		14:00			206		247		453	
02:15			22		7		29		14:15			224		213		437	
02:30			8		18		26		14:30			246		241		487	
02:45			8	68	14	52	22	120	14:45			229	905	247	948	476	1853
03:00			10		6		16		15:00			240		258		498	
03:15			13		7		20		15:15			293		268		561	
03:30			23		19		42		15:30			306		243		549	
03:45			28	74	18	50	46	124	15:45			353	1192	253	1022	606	2214
04:00			19		21		40		16:00			373		245		618	
04:15			25		28		53		16:15			358		272		630	
04:30			52		54		106		16:30			391		248		639	
04:45			68	164	60	163	128	327	16:45			392	1514	290	1055	682	2569
05:00			57		94		151		17:00			402		276		678	
05:15			63		135		198		17:15			433		268		701	
05:30			67		147		214		17:30			366		223		589	
05:45			72	259	193	569	265	828	17:45			405	1606	249	1016	654	2622
06:00			91		180		271		18:00			288		248		536	
06:15			87		169		256		18:15			277		215		492	
06:30			133		220		353		18:30			244		177		421	
06:45			177	488	237	806	414	1294	18:45			218	1027	195	835	413	1862
07:00			155		184		339		19:00			222		174		396	
07:15			177		250		427		19:15			203		163		366	
07:30			233		247		480		19:30			177		170		347	
07:45			285	850	279	960	564	1810	19:45			189	791	174	681	363	1472
08:00			270		257		527		20:00			181		136		317	
08:15			248		253		501		20:15			150		152		302	
08:30			227		233		460		20:30			138		165		303	
08:45			240	985	243	986	483	1971	20:45			127	596	153	606	280	1202
09:00			236		247		483		21:00			141		173		314	
09:15			206		245		451		21:15			135		164		299	
09:30			228		235		463		21:30			161		144		305	
09:45			257	927	217	944	474	1871	21:45			138	575	124	605	262	1180
10:00			208		239		447		22:00			97		110		207	
10:15			243		246		489		22:15			96		96		192	
10:30			208		229		437		22:30			78		82		160	
10:45			200	859	213	927	413	1786	22:45			63	334	63	351	126	685
11:00			243		244		487		23:00			61		66		127	
11:15			211		252		463		23:15			54		52		106	
11:30			236		292		528		23:30			50		45		95	
11:45			234	924	238	1026	472	1950	23:45			59	224	24	187	83	411
TOTALS				5822		6660		12482	TOTALS				10703		9399		20102
SPLIT %				46.6%		53.4%		38.3%	SPLIT %				53.2%		46.8%		61.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	16,525	16,059	32,584

	NB	SB	EB	WB	TOTAL		NB	SB	EB	WB	TOTAL
AM Peak Hour			07:30	11:30	07:30	PM Peak Hour			16:30	12:15	16:30
AM Pk Volume			1036	1050	2072	PM Pk Volume			1618	1110	2700
Pk Hr Factor			0.909	0.896	0.918	Pk Hr Factor			0.934	0.947	0.963
7 - 9 Volume	0	0	1835	1946	3781	4 - 6 Volume	0	0	3120	2071	5191
7 - 9 Peak Hour			07:30	07:30	07:30	4 - 6 Peak Hour			16:30	16:15	16:30
7 - 9 Pk Volume	0	0	1036	1036	2072	4 - 6 Pk Volume	0	0	1618	1086	2700
Pk Hr Factor	0.000	0.000	0.909	0.928	0.918	Pk Hr Factor	0.000	0.000	0.934	0.936	0.963

Prepared by NDS/ATD

VOLUME

Magic Mountain Pkwy Bet. The Old Rd & I-5 SB Ramps

Day: Thursday
Date: 7/28/2016

City: Santa Clarita
Project #: CA16_5500_004

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	12,286	22,458	34,744

AM Period	NB	SB	EB		WB		TOTAL	
00:00			20		56		76	
00:15			16		30		46	
00:30			7		42		49	
00:45			19	62	24	152	43	214
01:00			19		20		39	
01:15			6		20		26	
01:30			14		26		40	
01:45			14	53	20	86	34	139
02:00			8		24		32	
02:15			13		22		35	
02:30			6		32		38	
02:45			10	37	29	107	39	144
03:00			9		10		19	
03:15			10		22		32	
03:30			5		36		41	
03:45			12	36	60	128	72	164
04:00			1		37		38	
04:15			5		50		55	
04:30			16		95		111	
04:45			8	30	118	300	126	330
05:00			12		103		115	
05:15			20		154		174	
05:30			16		254		270	
05:45			35	83	323	834	358	917
06:00			38		178		216	
06:15			36		217		253	
06:30			39		270		309	
06:45			32	145	359	1024	391	1169
07:00			52		297		349	
07:15			65		353		418	
07:30			71		314		385	
07:45			90	278	368	1332	458	1610
08:00			61		338		399	
08:15			81		292		373	
08:30			71		266		337	
08:45			75	288	292	1188	367	1476
09:00			89		357		446	
09:15			126		320		446	
09:30			126		389		515	
09:45			136	477	416	1482	552	1959
10:00			162		500		662	
10:15			129		504		633	
10:30			142		503		645	
10:45			167	600	511	2018	678	2618
11:00			119		486		605	
11:15			114		488		602	
11:30			155		432		587	
11:45			218	606	420	1826	638	2432
TOTALS				2695		10477		13172
SPLIT %				20.5%		79.5%		37.9%

PM Period	NB	SB	EB		WB		TOTAL	
12:00			227		393		620	
12:15			121		460		581	
12:30			117		415		532	
12:45			122	587	360	1628	482	2215
13:00			135		339		474	
13:15			111		323		434	
13:30			213		303		516	
13:45			121	580	208	1173	329	1753
14:00			189		275		464	
14:15			165		246		411	
14:30			185		259		444	
14:45			134	673	303	1083	437	1756
15:00			160		290		450	
15:15			218		335		553	
15:30			261		287		548	
15:45			256	895	329	1241	585	2136
16:00			241		312		553	
16:15			243		328		571	
16:30			266		312		578	
16:45			271	1021	359	1311	630	2332
17:00			268		344		612	
17:15			295		306		601	
17:30			253		327		580	
17:45			254	1070	347	1324	601	2394
18:00			228		417		645	
18:15			209		338		547	
18:30			357		274		631	
18:45			286	1080	289	1318	575	2398
19:00			270		246		516	
19:15			219		283		502	
19:30			275		212		487	
19:45			322	1086	209	950	531	2036
20:00			301		178		479	
20:15			244		192		436	
20:30			346		191		537	
20:45			393	1284	157	718	550	2002
21:00			343		172		515	
21:15			247		157		404	
21:30			122		149		271	
21:45			129	841	120	598	249	1439
22:00			71		123		194	
22:15			85		102		187	
22:30			96		84		180	
22:45			34	286	74	383	108	669
23:00			51		87		138	
23:15			70		65		135	
23:30			36		45		81	
23:45			31	188	57	254	88	442
TOTALS				9591		11981		21572
SPLIT %				44.5%		55.5%		62.1%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	12,286	22,458	34,744

	NB	SB	EB	WB	TOTAL
AM Peak Hour			11:30	10:00	10:00
AM Pk Volume			721	2018	2618
Pk Hr Factor			0.794	0.987	0.965
7 - 9 Volume	0	0	566	2520	3086
7 - 9 Peak Hour			07:30	07:15	07:15
7 - 9 Pk Volume	0	0	303	1373	1660
Pk Hr Factor	0.000	0.000	0.842	0.933	0.906

	NB	SB	EB	WB	TOTAL
PM Peak Hour			20:30	12:00	17:15
PM Pk Volume			1329	1628	2427
Pk Hr Factor			0.845	0.885	0.941
4 - 6 Volume	0	0	2091	2635	4726
4 - 6 Peak Hour			16:30	16:15	16:45
4 - 6 Pk Volume	0	0	1100	1343	2423
Pk Hr Factor	0.000	0.000	0.932	0.935	0.962

Prepared by NDS/ATD

VOLUME

Magic Mountain Pkwy E/O Tourney Rd

Day: Thursday
Date: 7/28/2016

City: Santa Clarita
Project #: CA16_5500_005

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	25,143	26,560	51,703

AM Period	NB		SB		EB		WB		TOTAL	
00:00					71		62		133	
00:15					66		56		122	
00:30					68		38		106	
00:45					47	252	39	195	86	447
01:00					50		53		103	
01:15					44		34		78	
01:30					48		30		78	
01:45					41	183	38	155	79	338
02:00					57		44		101	
02:15					43		23		66	
02:30					53		18		71	
02:45					59	212	35	120	94	332
03:00					49		29		78	
03:15					42		43		85	
03:30					72		41		113	
03:45					33	196	37	150	70	346
04:00					71		63		134	
04:15					76		69		145	
04:30					87		97		184	
04:45					135	369	106	335	241	704
05:00					114		102		216	
05:15					135		151		286	
05:30					201		230		431	
05:45					195	645	231	714	426	1359
06:00					165		224		389	
06:15					195		254		449	
06:30					226		281		507	
06:45					206	792	256	1015	462	1807
07:00					192		201		393	
07:15					201		332		533	
07:30					253		294		547	
07:45					270	916	389	1216	659	2132
08:00					219		325		544	
08:15					266		389		655	
08:30					275		301		576	
08:45					264	1024	341	1356	605	2380
09:00					288		333		621	
09:15					262		364		626	
09:30					287		427		714	
09:45					351	1188	380	1504	731	2692
10:00					309		401		710	
10:15					262		410		672	
10:30					341		474		815	
10:45					325	1237	344	1629	669	2866
11:00					353		411		764	
11:15					343		463		806	
11:30					313		447		760	
11:45					360	1369	442	1763	802	3132
TOTALS						8383		10152		18535
SPLIT %						45.2%		54.8%		35.8%

PM Period	NB		SB		EB		WB		TOTAL	
12:00					358		458		816	
12:15					376		495		871	
12:30					356		417		773	
12:45					437	1527	406	1776	843	3303
13:00					331		465		796	
13:15					373		456		829	
13:30					428		542		970	
13:45					422	1554	495	1958	917	3512
14:00					424		396		820	
14:15					399		523		922	
14:30					357		599		956	
14:45					430	1610	549	2067	979	3677
15:00					424		523		947	
15:15					361		505		866	
15:30					437		427		864	
15:45					403	1625	305	1760	708	3385
16:00					459		258		717	
16:15					425		301		726	
16:30					460		229		689	
16:45					457	1801	331	1119	788	2920
17:00					505		259		764	
17:15					423		286		709	
17:30					504		220		724	
17:45					428	1860	265	1030	693	2890
18:00					499		345		844	
18:15					472		398		870	
18:30					409		396		805	
18:45					415	1795	306	1445	721	3240
19:00					420		349		769	
19:15					454		370		824	
19:30					362		382		744	
19:45					371	1607	360	1461	731	3068
20:00					333		319		652	
20:15					333		355		688	
20:30					275		317		592	
20:45					283	1224	309	1300	592	2524
21:00					290		419		709	
21:15					290		406		696	
21:30					234		284		518	
21:45					210	1024	247	1356	457	2380
22:00					194		225		419	
22:15					195		201		396	
22:30					150		149		299	
22:45					154	693	126	701	280	1394
23:00					127		141		268	
23:15					118		114		232	
23:30					115		109		224	
23:45					80	440	71	435	151	875
TOTALS						16760		16408		33168
SPLIT %						50.5%		49.5%		64.2%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	25,143	26,560	51,703

	NB	SB	EB	WB	TOTAL
AM Peak Hour			11:45	11:30	11:45
AM Pk Volume			1450	1842	3262
Pk Hr Factor			0.964	0.930	0.936
7 - 9 Volume	0	0	1940	2572	4512
7 - 9 Peak Hour			07:45	07:45	07:45
7 - 9 Pk Volume	0	0	1030	1404	2434
Pk Hr Factor	0.000	0.000	0.936	0.902	0.923

	NB	SB	EB	WB	TOTAL
PM Peak Hour			17:30	14:15	14:15
PM Pk Volume			1903	2194	3804
Pk Hr Factor			0.944	0.916	0.971
4 - 6 Volume	0	0	3661	2149	5810
4 - 6 Peak Hour			16:45	16:15	16:45
4 - 6 Pk Volume	0	0	1889	1120	2985
Pk Hr Factor	0.000	0.000	0.935	0.846	0.947

Existing 24 Hour Machine Counts

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5499-001

City: Santa Clarita

Day: Thursday

Date: 7/28/2016

AM

NS/EW Streets:	I-5 NB Ramps			I-5 NB Ramps			Magic Mountain Pkwy			Magic Mountain Pkwy			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	2	0.5	1.5	0	0	0	2	3	0	0	3.5	1.5	
7:00 AM	235	0	93	0	0	0	1	63	0	0	145	39	576
7:15 AM	288	0	108	0	0	0	11	67	0	0	196	53	723
7:30 AM	237	0	129	0	0	0	11	117	0	0	197	51	742
7:45 AM	292	0	143	0	0	0	9	128	0	0	207	72	851
8:00 AM	253	0	158	0	0	0	9	116	0	0	201	41	778
8:15 AM	221	0	125	0	0	0	4	115	0	0	216	52	736
8:30 AM	186	0	123	0	0	0	5	107	0	0	192	35	648
8:45 AM	212	0	117	0	0	0	6	119	0	0	210	39	703

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	1924	0	999	0	0	0	56	832	0	0	1564	382	5757
APPROACH %'s :	65.82%	0.00%	34.18%	#DIV/0!	#DIV/0!	#DIV/0!	6.31%	93.69%	0.00%	0.00%	80.37%	19.63%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	1003	0	558	0	0	0	33	476	0	0	821	216	3107
PEAK HR FACTOR :		0.897			0.000			0.929			0.929		0.913

CONTROL : Signalized

UTURNS			
NB	SB	EB	WB

NB	SB	EB	WB
0	0	0	0

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5499-001

City: Santa Clarita

Day: Thursday

Date: 7/28/2016

PM

NS/EW Streets:	I-5 NB Ramps			I-5 NB Ramps			Magic Mountain Pkwy			Magic Mountain Pkwy			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	2	0.5	1.5	0	0	0	2	3	0	0	3.5	1.5	
4:00 PM	185	0	154	0	0	0	24	221	0	0	168	80	832
4:15 PM	191	0	175	0	0	0	40	181	0	0	176	85	848
4:30 PM	185	0	179	0	0	0	32	215	0	0	178	82	871
4:45 PM	235	0	169	0	0	0	26	217	0	0	175	110	932
5:00 PM	227	1	180	0	0	0	23	226	0	0	178	102	937
5:15 PM	200	1	171	0	0	0	40	245	0	0	171	93	921
5:30 PM	224	0	174	0	0	0	25	198	0	0	152	74	847
5:45 PM	235	2	196	0	0	0	24	202	0	0	152	90	901
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	1682	4	1398	0	0	0	234	1705	0	0	1350	716	7089
APPROACH %'s :	54.54%	0.13%	45.33%	#DIV/0!	#DIV/0!	#DIV/0!	12.07%	87.93%	0.00%	0.00%	65.34%	34.66%	
PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	847	2	699	0	0	0	121	903	0	0	702	387	3661
PEAK HR FACTOR :		0.949			0.000			0.898			0.955		0.977

CONTROL : Signalized

UTURNS			
NB	SB	EB	WB
		0	
		1	
		0	
		0	
		0	
		1	
		0	
		0	
NB	SB	EB	WB
0	0	2	0

ITM Peak Hour Summary

Prepared by:

NDS

National Data & Surveying Services

I-5 NB Ramps and Magic Mountain Pkwy , Santa Clarita

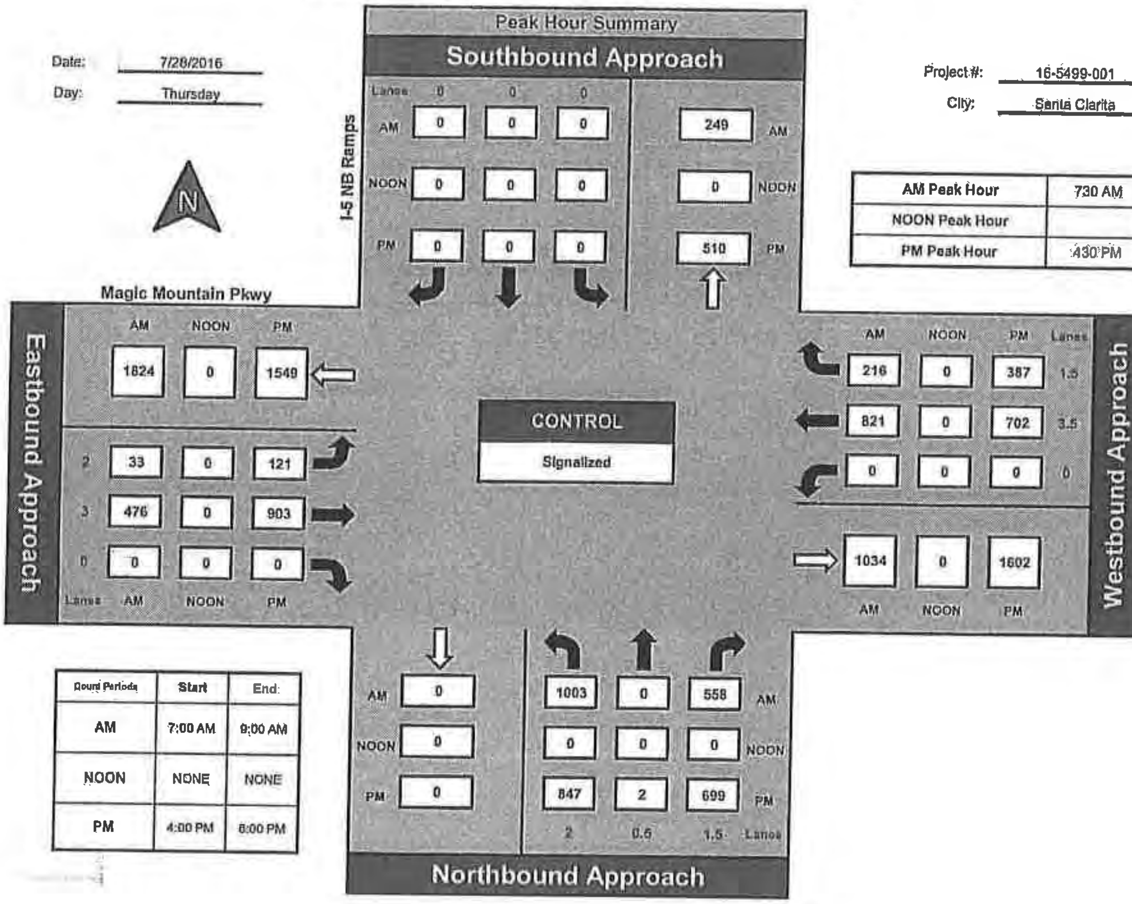
Date: 7/28/2016

Day: Thursday

Project #: 16-5499-001

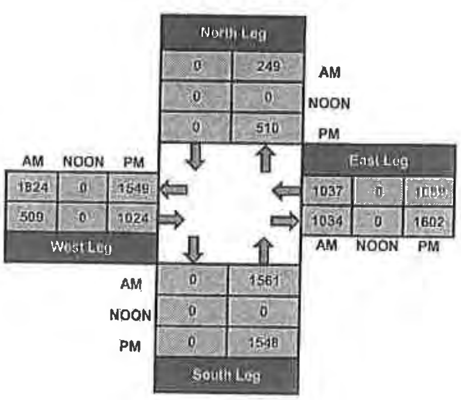
City: Santa Clarita

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	430 PM

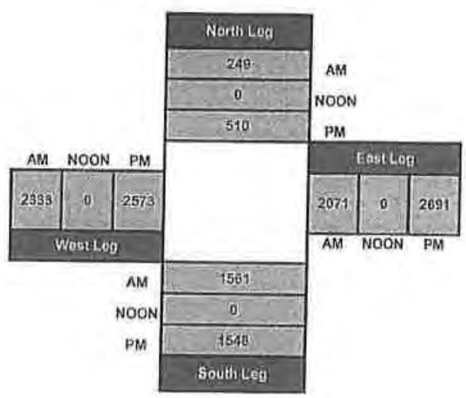


Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5499-002

City: Santa Clarita

Day: Thursday

Date: 7/28/2016

AM

NS/EW Streets:	I-5 SB Ramps			I-5 SB Ramps			Magic Mountain Pkwy			Magic Mountain Pkwy			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	0	0	1.5	0.5	2	0	3	2	2	4	0	
7:00 AM	0	0	0	31	1	11	0	37	17	119	282	0	498
7:15 AM	0	0	0	39	0	10	0	32	30	135	346	0	592
7:30 AM	0	0	0	76	0	6	0	51	24	130	307	0	594
7:45 AM	0	0	0	85	1	10	0	57	26	117	355	0	651
8:00 AM	0	0	0	83	0	11	0	42	29	140	320	0	625
8:15 AM	0	0	0	67	0	10	0	53	22	154	285	0	591
8:30 AM	0	0	0	63	0	8	0	46	32	119	252	0	520
8:45 AM	0	0	0	70	1	15	0	54	20	140	286	0	586
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	514	3	81	0	372	200	1054	2433	0	4657
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	85.95%	0.50%	13.55%	0.00%	65.03%	34.97%	30.23%	69.77%	0.00%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL. :	0	0	0	263	1	37	0	182	109	522	1328	0	2462
PEAK HR FACTOR :		0.000			0.836			0.877			0.962		0.945

CONTROL : Signalized

UTURNS			
NB	SB	EB	WB
			0
			0
			0
			0
			0
			1
			2
			0
NB	SB	EB	WB
0	0	0	3

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5499-002

City: Santa Clarita

Day: Thursday

Date: 7/28/2016

PM

NS/EW Streets:	I-5 SB Ramps			I-5 SB Ramps			Magic Mountain Pkwy			Magic Mountain Pkwy			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	0	0	1.5	0.5	2	0	3	2	2	4	0	
4:00 PM	0	0	0	70	0	42	0	177	73	77	279	0	718
4:15 PM	0	0	0	47	1	32	0	168	68	69	295	0	681
4:30 PM	0	0	0	76	0	25	0	173	99	87	279	0	739
4:45 PM	0	0	0	60	0	30	0	188	76	71	330	0	755
5:00 PM	0	0	0	67	0	32	0	195	80	106	308	0	788
5:15 PM	0	0	0	58	0	24	1	219	73	74	281	0	730
5:30 PM	0	0	0	43	0	25	0	180	75	84	294	0	701
5:45 PM	0	0	0	48	1	30	0	176	72	74	317	0	718
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	469	2	240	1	1476	616	642	2384	0	5830
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	65.96%	0.28%	33.76%	0.05%	70.52%	29.43%	21.22%	78.78%	0.00%	
PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	0	0	0	261	0	111	1	775	328	338	1198	0	3012
PEAK HR FACTOR :		0.000			0.921			0.942			0.928		0.956

CONTROL : Signalized

UTURNS			
NB	SB	EB	WB
		0	0
		0	0
		0	0
		0	0
		0	0
		1	0
		0	0
		0	1
NB	SB	EB	WB
0	0	1	1

ITM Peak Hour Summary

Prepared by:

NDS

National Data & Surveying Services

I-5 SB Ramps and Magic Mountain Pkwy , Santa Clarita

Date: 7/28/2016

Day: Thursday

Project #: 16-5499-002

City: Santa Clarita

AM Peak Hour	715 AM
NOON Peak Hour	
PM Peak Hour	430 PM

N

Peak Hour Summary

CONTROL: Signalized

Southbound Approach (I-5 SB Ramps)

	Left	Thru	Right	Departing
Lanes	2	0.5	1.5	
AM	37	1	283	0
NOON	0	0	0	0
PM	111	0	261	1

Eastbound Approach (Magic Mountain Pkwy)

	Lanes	AM	NOON	PM
Departing		1365	0	1309
Left	0	0	0	1
Thru	3	182	0	775
Right	2	109	0	328

Westbound Approach

	AM	NOON	PM	Lanes
Right	0	0	0	0
Thru	1328	0	1198	4
Left	522	0	338	2
Departing	465	0	1036	

Northbound Approach

	Departing	Left	Thru	Right
AM	632	0	0	0
NOON	0	0	0	0
PM	666	0	0	0
Lanes		0	0	0

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs

North Leg

	In	Out
AM	321	0
NOON	0	0
PM	372	1

West Leg

	AM	NOON	PM
Out	1365	0	1309
In	291	0	1104

East Leg

	AM	NOON	PM
In	1850	0	1536
Out	465	0	1036

South Leg

	Out	In
AM	632	0
NOON	0	0
PM	666	0

Total Volume Per Leg

Leg	AM	NOON	PM
North Leg	321	0	373
West Leg	1656	0	2413
East Leg	2315	0	2572
South Leg	632	0	666

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5499-003

City: Santa Clarita

Day: Thursday

Date: 7/28/2016

AM

NS/EW Streets:	The Old Rd			The Old Rd			Magic Mountain Pkwy			Magic Mountain Pkwy			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	2	3	1	2	3	1	2	4	1	2	4	1	
7:00 AM	5	54	13	36	20	0	6	6	1	24	20	255	440
7:15 AM	12	62	16	33	28	0	4	16	0	36	20	293	520
7:30 AM	5	71	18	38	28	0	9	16	1	32	22	263	503
7:45 AM	5	81	25	43	29	1	7	13	1	35	18	316	574
8:00 AM	2	69	19	33	48	0	7	24	0	25	18	291	536
8:15 AM	3	66	20	37	54	0	4	9	4	26	10	260	513
8:30 AM	4	73	14	42	40	0	4	21	1	25	22	218	464
8:45 AM	11	88	23	40	30	1	5	15	2	30	18	246	517
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	47	584	148	302	285	2	46	120	10	233	148	2142	4067
APPROACH %'s :	6.03%	74.97%	19.00%	51.27%	48.39%	0.34%	26.14%	68.18%	5.68%	9.24%	5.87%	84.90%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	24	283	78	147	133	1	27	69	2	128	78	1163	2133
PEAK HR FACTOR :		0.867			0.867			0.790			0.928		0.929

CONTROL : Signalized

UTURNS			
NB	SB	EB	WB
4		0	2
5		2	0
4		1	2
5		0	3
2		0	3
2		0	2
2		1	2
8		0	2
NB	SB	EB	WB
32	0	4	16

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5499-003

City: Santa Clarita

Day: Thursday

Date: 7/28/2016

PM

NS/EW Streets:	The Old Rd			The Old Rd			Magic Mountain Pkwy			Magic Mountain Pkwy			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	2	3	1	2	3	1	2	4	1	2	4	1	
4:00 PM	20	103	57	110	185	6	9	92	20	70	35	202	909
4:15 PM	12	80	48	102	190	5	14	99	24	97	29	206	906
4:30 PM	15	88	61	131	251	8	17	92	18	65	28	212	981
4:45 PM	11	96	63	118	310	7	20	94	31	84	33	251	1116
5:00 PM	5	91	61	134	298	7	13	85	32	71	33	233	1063
5:15 PM	16	78	71	129	374	11	18	94	33	74	27	205	1130
5:30 PM	12	97	65	101	344	8	28	108	33	71	38	223	1128
5:45 PM	14	103	58	110	271	4	9	86	21	63	31	253	1023

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	105	736	484	933	2223	56	123	750	212	595	254	1785	8256
APPROACH %'s :	7.92%	55.55%	36.53%	29.05%	69.21%	1.74%	11.34%	69.12%	19.54%	22.59%	9.64%	67.77%	

PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL. :	44	362	260	480	1326	37	79	381	129	300	131	912	4437
PEAK HR FACTOR :		0.952			0.894			0.871			0.912		0.982

CONTROL : Signalized

UTURNS

NB	SB	EB	WB
10	0	0	5
3	0	0	8
5	0	2	4
4	0	0	6
8	1	0	6
7	1	0	8
3	1	0	7
6	0	1	7

NB	SB	EB	WB
46	3	3	51

ITM Peak Hour Summary

Prepared by:

NDS

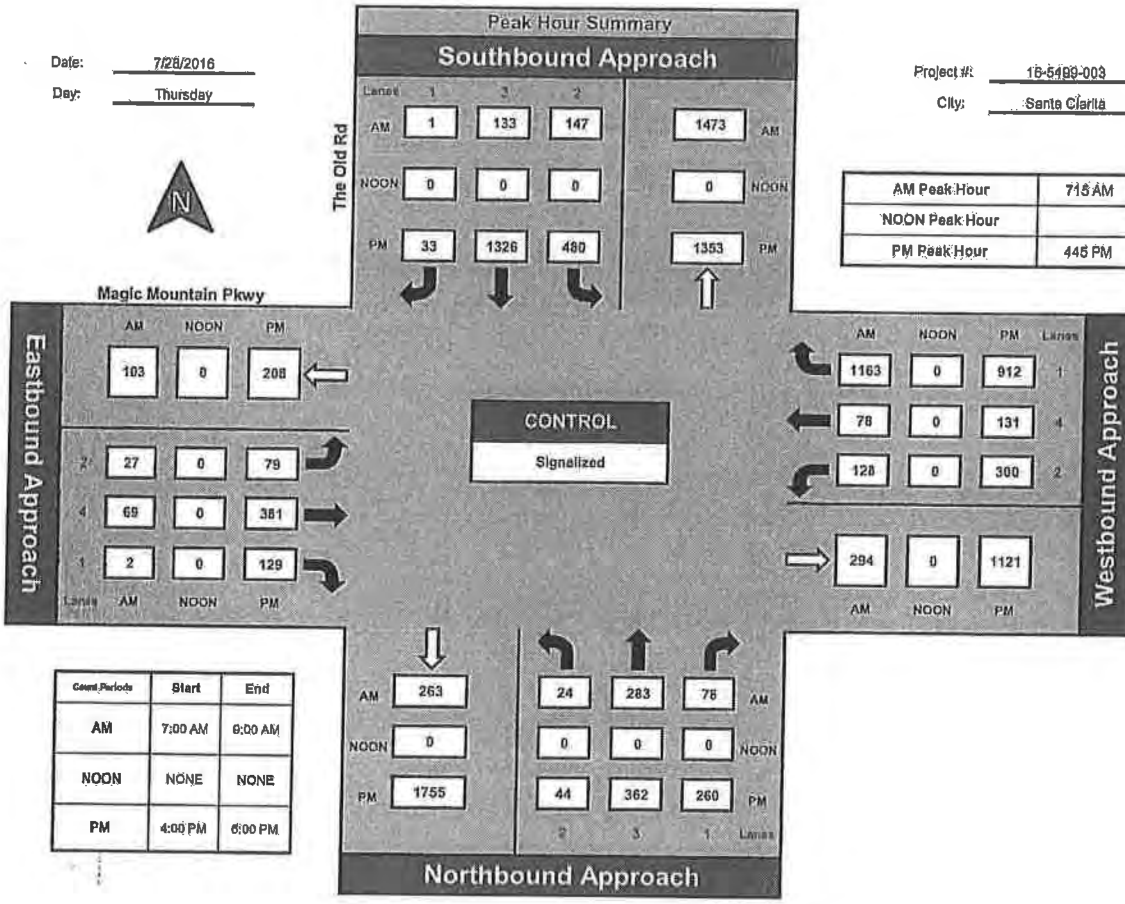
National Data & Surveying Services

The Old Rd and Magic Mountain Pkwy , Santa Clarita

Date: 7/28/2016
Day: Thursday

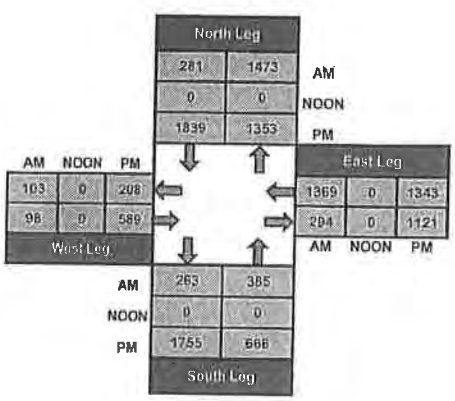
Project #: 16-5499-003
City: Santa Clarita

AM Peak Hour	715 AM
NOON Peak Hour	
PM Peak Hour	445 PM

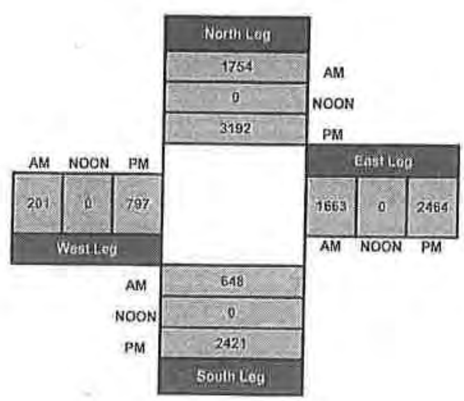


Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5499-004

City: Santa Clarita

Day: Thursday

Date: 7/28/2016

AM

NS/EW Streets:	Tourney Rd			Tourney Rd			Magic Mountain Pkwy			Magic Mountain Pkwy					UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND								
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL		NB	SB	EB	WB
LANES:	2	0	1	0	0	0	0	3	1	1	3	0						
7:00 AM	25	0	9	0	0	0	0	124	31	28	159	0	376					2
7:15 AM	27	0	10	0	0	0	0	127	38	63	226	0	491					6
7:30 AM	30	0	10	0	0	0	0	176	61	68	213	0	558					3
7:45 AM	32	0	6	0	0	0	0	217	66	91	252	0	664					5
8:00 AM	30	0	10	0	0	0	0	207	74	88	221	0	630					6
8:15 AM	33	0	15	0	0	0	0	178	62	117	225	0	630					5
8:30 AM	33	0	15	0	0	0	0	178	58	85	198	0	567					1
8:45 AM	32	0	15	0	0	0	0	163	63	82	220	0	575					3

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL		NB	SB	EB	WB
TOTAL VOLUMES :	242	0	90	0	0	0	0	1370	453	622	1714	0	4491		0	0	0	31
APPROACH %'s :	72.89%	0.00%	27.11%	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	75.15%	24.85%	26.63%	73.37%	0.00%						

PEAK HR START TIME :	7:45 AM												TOTAL
PEAK HR VOL :	128	0	46	0	0	0	0	780	260	381	896	0	2491
PEAK HR FACTOR :		0.906			0.000			0.919			0.931		0.938

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5499-004

City: Santa Clarita

Day: Thursday

Date: 7/28/2016

PM

NS/EW Streets:	Tourney Rd			Tourney Rd			Magic Mountain Pkwy			Magic Mountain Pkwy			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	2	0	1	0	0	0	0	3	1	1	3	0	
4:00 PM	54	0	48	0	0	0	0	311	56	28	202	0	699
4:15 PM	53	0	53	0	0	0	0	310	43	37	212	0	717
4:30 PM	54	0	79	0	0	0	0	355	34	27	205	0	754
4:45 PM	68	0	74	0	0	0	0	347	32	42	214	0	777
5:00 PM	71	0	103	0	0	0	0	363	45	24	215	0	821
5:15 PM	46	0	59	0	0	0	0	385	42	27	214	0	773
5:30 PM	47	0	68	0	0	0	0	345	33	22	180	0	695
5:45 PM	45	0	54	0	0	0	0	374	28	16	203	0	720
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	438	0	538	0	0	0	0	2799	313	223	1645	0	5956
APPROACH %'s :	44.88%	0.00%	55.12%	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	89.94%	10.06%	11.94%	88.06%	0.00%	
PEAK HR START TIME :	[illegible]												TOTAL
PEAK HR VOL :	239	0	315	0	0	0	0	1450	153	120	848	0	3125
PEAK HR FACTOR :		0.796			0.000			0.939			0.945		0.952

CONTROL : Signalized

UTURNS			
NB	SB	EB	WB
			0
			2
			1
			1
			2
			1
			0
			0
NB	SB	EB	WB
0	0	0	7

ITM Peak Hour Summary

Prepared by:

NDS

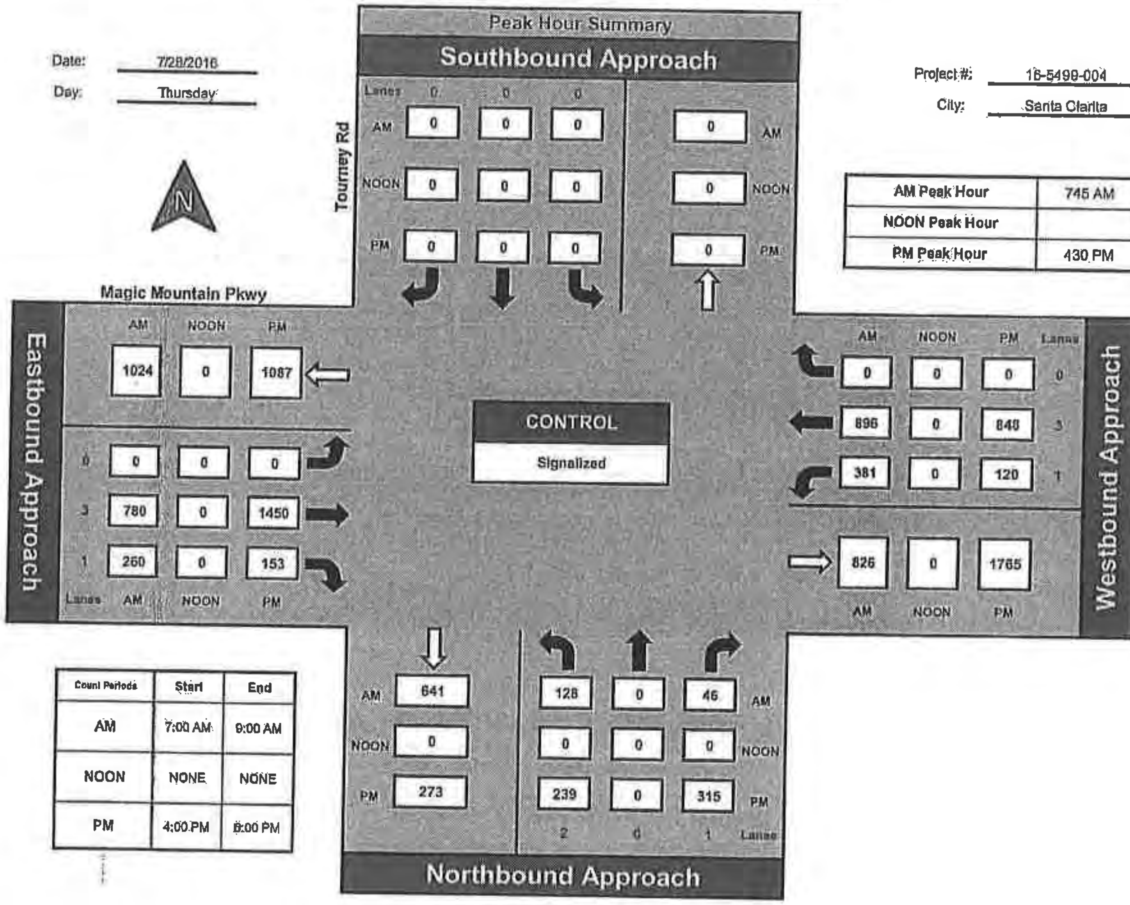
National Data & Surveying Services

Tourney Rd and Magic Mountain Pkwy , Santa Clarita

Date:	7/28/2016
Day:	Thursday

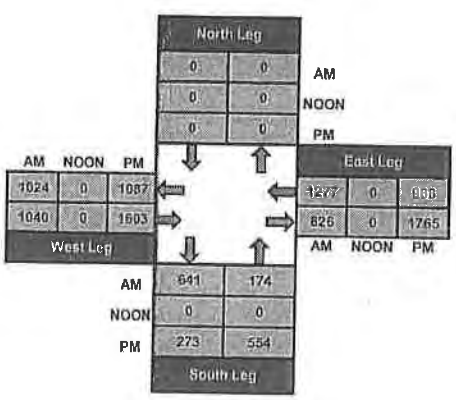
Project #:	16-5499-004
City:	Santa Clarita

AM Peak Hour	745 AM
NOON Peak Hour	
PM Peak Hour	430 PM

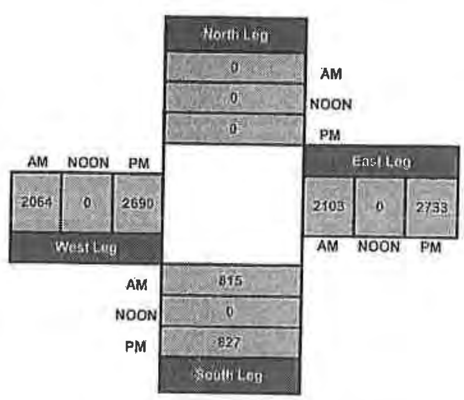


Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5499-005

City: Santa Clarita

Day: Thursday

Date: 7/28/2016

AM

NS/EW Streets:	Tourney Rd			Tourney Rd			Wayne Mills Pl			Wayne Mills Pl			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	1	1	1	1	0.5	0.5	1	0	1	0	
7:00 AM	0	7	6	23	26	11	12	1	0	5	2	19	112
7:15 AM	0	8	10	30	57	9	6	2	0	7	0	22	151
7:30 AM	2	8	11	35	78	7	12	2	1	13	1	16	186
7:45 AM	6	15	7	37	105	12	13	0	4	14	3	11	227
8:00 AM	2	14	8	34	113	7	11	2	3	13	0	21	228
8:15 AM	0	20	4	45	118	10	8	0	1	16	0	22	244
8:30 AM	1	14	7	31	100	10	6	0	2	12	1	18	202
8:45 AM	1	33	16	41	92	6	5	0	5	10	0	13	223
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	12	119	69	276	689	72	73	7	17	90	7	142	1573
APPROACH %'s :	6.00%	59.50%	34.50%	26.62%	66.44%	6.94%	75.26%	7.22%	17.53%	37.66%	2.93%	59.41%	
PEAK HR START TIME :	745 AM												TOTAL
PEAK HR VOL :	9	63	26	147	436	39	38	2	10	55	4	72	901
PEAK HR FACTOR :		0.875			0.899			0.735			0.862		0.923

CONTROL : 2-Way Stop (EB/WB)

UTURNS

	NB	SB	EB	WB
7:00 AM		0		
7:15 AM		0		
7:30 AM		0		
7:45 AM		0		
8:00 AM		0		
8:15 AM		1		
8:30 AM		1		
8:45 AM		0		

NB	SB	EB	WB
0	2	0	0

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5499-005

City: Santa Clarita

Day: Thursday

Date: 7/28/2016

PM

NS/EW Streets:	Tourney Rd			Tourney Rd			Wayne Mills Pl			Wayne Mills Pl			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	1	1	1	1	0.5	0.5	1	0	1	0	
4:00 PM	1	69	14	28	43	14	6	0	4	11	1	27	218
4:15 PM	1	80	13	26	40	11	9	1	0	8	2	12	203
4:30 PM	0	109	9	21	28	12	12	0	2	11	1	15	220
4:45 PM	2	113	8	25	34	14	13	1	3	17	1	19	250
5:00 PM	0	136	8	18	37	11	9	1	3	12	0	32	267
5:15 PM	1	79	7	24	35	10	2	1	1	4	0	18	182
5:30 PM	0	96	7	19	27	9	9	0	0	12	1	19	199
5:45 PM	3	70	5	18	20	7	12	0	3	9	2	16	165

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	8	752	71	179	264	88	72	4	16	84	8	158	1704
APPROACH %'s :	0.96%	90.49%	8.54%	33.71%	49.72%	16.57%	78.26%	4.35%	17.39%	33.60%	3.20%	63.20%	

PEAK HR START TIME :	415 PM												TOTAL
PEAK HR VOL :	3	438	38	90	139	48	43	3	8	48	4	78	940
PEAK HR FACTOR :		0.832			0.899			0.794			0.739		0.880

CONTROL : 2-Way Stop (EB/WB)

UTURNS			
NB	SB	EB	WB
0	0		
0	1		
0	0		
1	0		
0	0		
0	1		
0	1		
0	1		

NB	SB	EB	WB
1	4	0	0

ITM Peak Hour Summary

Prepared by:

NDS

National Data & Surveying Services

Tourney Rd and Wayne Mills Pl , Santa Clarita

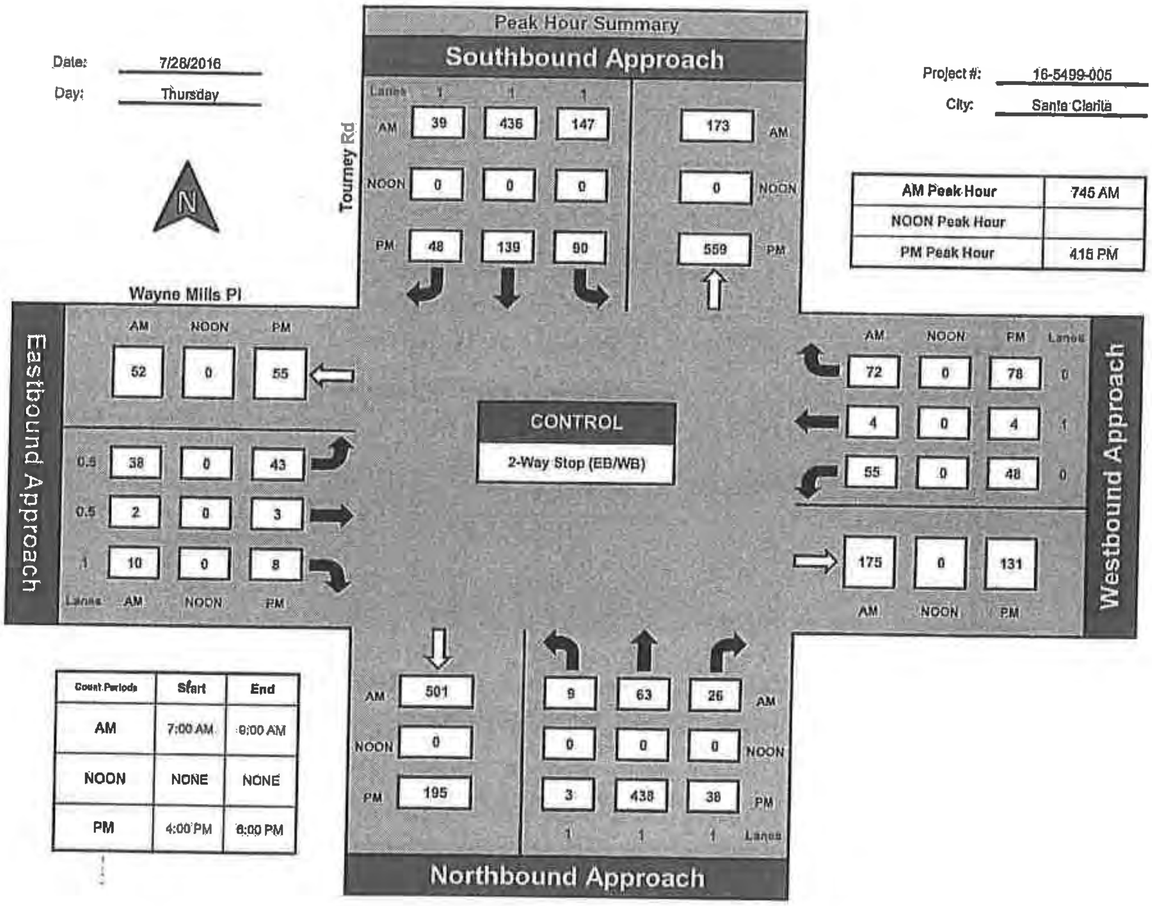
Date: 7/28/2016

Day: Thursday

Project #: 16-5499-005

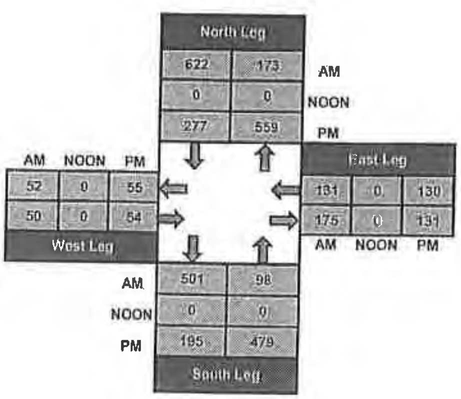
City: Santa Clarita

AM Peak Hour	745 AM
NOON Peak Hour	
PM Peak Hour	415 PM

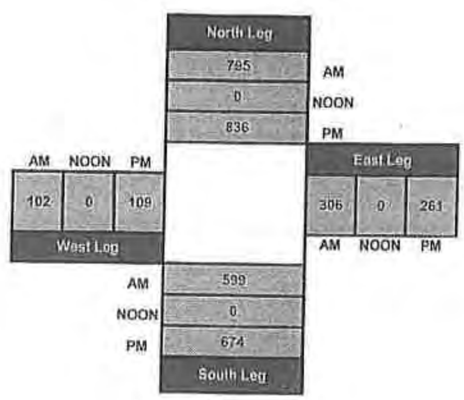


Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



APPENDIX B

- Existing Conditions Analysis Worksheets

EX

1. The Old Rd & Magic Mountain Pkwy						
			AM PEAK HOUR		PM PEAK HOUR	
	LANES	CAPACITY	VOL	V/C	VOL	V/C
NBL	2	3400	24	0.007	44	0.013 *
NBT	3	5100	283	0.055 *	362	0.071
NBR	1	1700	78	0.046	260	0.153
SBL	2	3400	147	0.043 *	480	0.141
SBT	3	5100	133	0.026	1326	0.260 *
SBR	1	1700	1	0.001	33	0.019
EBL	2	3400	27	0.008	79	0.023
EBT	4	6800	69	0.010 *	381	0.056 *
EBR	1	1700	2	0.001	129	0.076
WBL	2	3400	128	0.038 *	300	0.088 *
WBT	4	6800	78	0.011	131	0.019
WBR	f	0	1163	0.000	912	0.000
RIGHT TURN ADJUSTMENT					WBR	0.003 *
CLEARANCE INTERVAL				0.050 *		0.050 *
TOTAL ICU				0.196		0.470

*d = defacto right turn lane, f = free right turn lane

2. I-5 SB Ramps & Magic Mountain Pkwy						
			AM PEAK HOUR		PM PEAK HOUR	
	LANES	CAPACITY	VOL	V/C	VOL	V/C
NBL	0	0	0	0.000	0	0.000
NBT	0	0	0	0.000	0	0.000
NBR	0	0	0	0.000	0	0.000
SBL	1.5	2550	283	0.111 *	261	0.102 *
SBT	0.5	850	1	0.001	0	0.000
SBR	2	3400	37	0.011	111	0.033
EBL	0	0	0	0.000	0	0.000
EBT	3	5100	182	0.036	775	0.152 *
EBR	2	3400	109	0.032	328	0.096
WBL	2	3400	527	0.155	338	0.099 *
WBT	4	6800	1328	0.195 *	1198	0.176
WBR	0	0	0	0.000	0	0.000
RIGHT TURN ADJUSTMENT						
CLEARANCE INTERVAL				0.050 *		0.050 *
TOTAL ICU				0.356		0.403

EX

3. I-5 NB Ramps & Magic Mountain Pkwy

	LANES	CAPACITY	AM PEAK HOUR VOL	AM PEAK HOUR V/C	PM PEAK HOUR VOL	PM PEAK HOUR V/C
NBL	2	3400	1003	0.295 *	847	0.249 *
NBT	0.5	850	0	0.000	2	0.002
NBR	1.5	2550	558	0.219	699	0.274
SBL	0	0	0	0.000	0	0.000
SBT	0	0	0	0.000	0	0.000
SBR	0	0	0	0.000	0	0.000
EBL	2	3400	33	0.010 *	121	0.036
EBT	3	5100	476	0.093	903	0.177 *
EBR	0	0	0	0.000	0	0.000
WBL	0	0	0	0.000	0	0.000
WBT	3.5	5950	821	0.138 *	702	0.118
WBR	1.5	2550	216	0.085	387	0.152
RIGHT TURN ADJUSTMENT					NBR	0.034 *
CLEARANCE INTERVAL				0.050 *		0.050 *
TOTAL ICU				0.493		0.510

4. Tourney Rd & Magic Mountain Pkwy

	LANES	CAPACITY	AM PEAK HOUR VOL	AM PEAK HOUR V/C	PM PEAK HOUR VOL	PM PEAK HOUR V/C
NBL	2	3400	128	0.038 *	239	0.070 *
NBT	0	0	0	0.000	0	0.000
NBR	1	1700	315	0.185	315	0.185
SBL	0	0	0	0.000	0	0.000
SBT	0	0	0	0.000	0	0.000
SBR	0	0	0	0.000	0	0.000
EBL	0	0	0	0.000	0	0.000
EBT	3	5100	780	0.153 *	1450	0.284 *
EBR	1	1700	260	0.153	153	0.090
WBL	1	1700	381	0.224 *	120	0.071 *
WBT	3	5100	896	0.176	848	0.166
WBR	0	0	0	0.000	0	0.000
RIGHT TURN ADJUSTMENT					NBR	0.055 *
CLEARANCE INTERVAL				0.050 *		0.050 *
TOTAL ICU				0.465		0.530

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑	↱		↰↑↱		↰	↑	↱	↰	↑	↱
Volume (veh/h)	38	2	10	55	4	72	9	63	26	147	436	39
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	41	2	11	60	4	78	10	68	28	160	474	42
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			6									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	962	910	474	888	924	68	516			97		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	962	910	474	888	924	68	516			97		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	79	99	98	75	98	92	99			89		
cM capacity (veh/h)	195	243	590	235	238	995	1049			1497		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	54	142	10	68	28	160	474	42
Volume Left	41	60	10	0	0	160	0	0
Volume Right	11	78	0	0	28	0	0	42
cSH	247	405	1049	1700	1700	1497	1700	1700
Volume to Capacity	0.22	0.35	0.01	0.04	0.02	0.11	0.28	0.02
Queue Length 95th (ft)	20	39	1	0	0	9	0	0
Control Delay (s)	24.9	18.6	8.5	0.0	0.0	7.7	0.0	0.0
Lane LOS	C	C	A			A		
Approach Delay (s)	24.9	18.6	0.8			1.8		
Approach LOS	C	C						

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	43	3	8	48	4	78	3	438	38	90	139	48
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	47	3	9	52	4	85	3	476	41	98	151	52
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			6									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	916	871	151	835	882	476	203			517		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	916	871	151	835	882	476	203			517		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	76	99	99	80	98	86	100			91		
cM capacity (veh/h)	198	262	895	261	258	589	1368			1048		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	59	141	3	476	41	98	151	52
Volume Left	47	52	3	0	0	98	0	0
Volume Right	9	85	0	0	41	0	0	52
cSH	237	392	1368	1700	1700	1048	1700	1700
Volume to Capacity	0.25	0.36	0.00	0.28	0.02	0.09	0.09	0.03
Queue Length 95th (ft)	24	40	0	0	0	8	0	0
Control Delay (s)	25.7	19.3	7.6	0.0	0.0	8.8	0.0	0.0
Lane LOS	D	C	A			A		
Approach Delay (s)	25.7	19.3	0.0			2.9		
Approach LOS	D	C						

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX C

- Existing + Project Conditions Analysis Worksheets

EXWP

1. The Old Rd & Magic Mountain Pkwy						
			AM PEAK HOUR		PM PEAK HOUR	
	LANES	CAPACITY	VOL	V/C	VOL	V/C
NBL	2	3400	24	0.007	44	0.013 *
NBT	3	5100	283	0.055 *	362	0.071
NBR	1	1700	78	0.046	260	0.153
SBL	2	3400	147	0.043 *	480	0.141
SBT	3	5100	133	0.026	1326	0.260 *
SBR	1	1700	1	0.001	33	0.019
EBL	2	3400	27	0.008	79	0.023
EBT	4	6800	81	0.012 *	394	0.058 *
EBR	1	1700	2	0.001	129	0.076
WBL	2	3400	128	0.038 *	300	0.088 *
WBT	4	6800	86	0.013	139	0.020
WBR	f	0	1163	0.000	912	0.000
RIGHT TURN ADJUSTMENT					EBR	0.006 *
CLEARANCE INTERVAL				0.050 *		0.050 *
TOTAL ICU				0.198		0.475

*d = defacto right turn lane, f = free right turn lane

2. I-5 SB Ramps & Magic Mountain Pkwy						
			AM PEAK HOUR		PM PEAK HOUR	
	LANES	CAPACITY	VOL	V/C	VOL	V/C
NBL	0	0	0	0.000	0	0.000
NBT	0	0	0	0.000	0	0.000
NBR	0	0	0	0.000	0	0.000
SBL	1.5	2550	295	0.116 *	274	0.107 *
SBT	0.5	850	1	0.001	0	0.000
SBR	2	3400	37	0.011	111	0.033
EBL	0	0	0	0.000	0	0.000
EBT	3	5100	194	0.038	788	0.155 *
EBR	2	3400	109	0.032	328	0.096
WBL	2	3400	534	0.157	350	0.103 *
WBT	4	6800	1336	0.196 *	1206	0.177
WBR	0	0	0	0.000	0	0.000
RIGHT TURN ADJUSTMENT						
CLEARANCE INTERVAL				0.050 *		0.050 *
TOTAL ICU				0.362		0.415

3. I-5 NB Ramps & Magic Mountain Pkwy			AM PEAK HOUR		PM PEAK HOUR	
	LANES	CAPACITY	VOL	V/C	VOL	V/C
NBL	2	3400	1003	0.295 *	847	0.249 *
NBT	0.5	850	0	0.000	2	0.002
NBR	1.5	2550	576	0.226	718	0.282
SBL	0	0	0	0.000	0	0.000
SBT	0	0	0	0.000	0	0.000
SBR	0	0	0	0.000	0	0.000
EBL	2	3400	33	0.010 *	121	0.036
EBT	3	5100	500	0.098	929	0.182 *
EBR	0	0	0	0.000	0	0.000
WBL	0	0	0	0.000	0	0.000
WBT	3.5	5950	841	0.141 *	723	0.122
WBR	1.5	2550	224	0.088	395	0.155
RIGHT TURN ADJUSTMENT					NBR	0.042 *
CLEARANCE INTERVAL				0.050 *		0.050 *
TOTAL ICU				0.496		0.523

4. Tourney Rd & Magic Mountain Pkwy			AM PEAK HOUR		PM PEAK HOUR	
	LANES	CAPACITY	VOL	V/C	VOL	V/C
NBL	2	3400	156	0.046 *	268	0.079 *
NBT	0	0	0	0.000	0	0.000
NBR	1	1700	46	0.027	315	0.185
SBL	0	0	0	0.000	0	0.000
SBT	0	0	0	0.000	0	0.000
SBR	0	0	0	0.000	0	0.000
EBL	0	0	0	0.000	0	0.000
EBT	3	5100	780	0.153 *	1450	0.284 *
EBR	1	1700	301	0.177	198	0.116
WBL	1	1700	393	0.231 *	133	0.078 *
WBT	3	5100	896	0.176	848	0.166
WBR	0	0	0	0.000	0	0.000
RIGHT TURN ADJUSTMENT					NBR	0.045 *
CLEARANCE INTERVAL				0.050 *		0.050 *
TOTAL ICU				0.480		0.536

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	66	10	14	55	4	72	15	63	26	147	436	92
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	72	11	15	60	4	78	16	68	28	160	474	100
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			6									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	975	923	474	908	995	68	574			97		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	975	923	474	908	995	68	574			97		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	62	95	97	73	98	92	98			89		
cM capacity (veh/h)	190	237	590	219	215	995	999			1497		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	98	142	16	68	28	160	474	100
Volume Left	72	60	16	0	0	160	0	0
Volume Right	15	78	0	0	28	0	0	100
cSH	232	383	999	1700	1700	1497	1700	1700
Volume to Capacity	0.42	0.37	0.02	0.04	0.02	0.11	0.28	0.06
Queue Length 95th (ft)	49	42	1	0	0	9	0	0
Control Delay (s)	32.2	19.9	8.7	0.0	0.0	7.7	0.0	0.0
Lane LOS	D	C	A			A		
Approach Delay (s)	32.2	19.9	1.2			1.7		
Approach LOS	D	C						

Intersection Summary			
Average Delay	6.8		
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		✥		↰	↑	↱	↰	↑	↱
Volume (veh/h)	72	11	12	48	4	78	9	438	38	90	139	106
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	78	12	13	52	4	85	10	476	41	98	151	115
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			6									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	929	884	151	855	958	476	266			517		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	929	884	151	855	958	476	266			517		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	59	95	99	79	98	86	99			91		
cM capacity (veh/h)	193	256	895	244	232	589	1298			1048		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	103	141	10	476	41	98	151	115
Volume Left	78	52	10	0	0	98	0	0
Volume Right	13	85	0	0	41	0	0	115
cSH	231	376	1298	1700	1700	1048	1700	1700
Volume to Capacity	0.45	0.38	0.01	0.28	0.02	0.09	0.09	0.07
Queue Length 95th (ft)	54	43	1	0	0	8	0	0
Control Delay (s)	33.1	20.3	7.8	0.0	0.0	8.8	0.0	0.0
Lane LOS	D	C	A			A		
Approach Delay (s)	33.1	20.3	0.1			2.4		
Approach LOS	D	C						

Intersection Summary			
Average Delay	6.4		
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	50	0	101	52	0	68
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	0	110	57	0	74
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			54		330	54
vC1, stage 1 conf vol					54	
vC2, stage 2 conf vol					276	
vCu, unblocked vol			54		330	54
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			93		100	93
cM capacity (veh/h)			1551		693	1013

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	54	110	57	74
Volume Left	0	110	0	0
Volume Right	0	0	0	74
cSH	1700	1551	1700	1013
Volume to Capacity	0.03	0.07	0.03	0.07
Queue Length 95th (ft)	0	6	0	6
Control Delay (s)	0.0	7.5	0.0	8.8
Lane LOS		A		A
Approach Delay (s)	0.0	4.9		8.8
Approach LOS				A

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	54	0	109	55	0	71
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	59	0	118	60	0	77
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			59		355	59
vC1, stage 1 conf vol					59	
vC2, stage 2 conf vol					297	
vCu, unblocked vol			59		355	59
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			92		100	92
cM capacity (veh/h)			1545		674	1007

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	59	118	60	77
Volume Left	0	118	0	0
Volume Right	0	0	0	77
cSH	1700	1545	1700	1007
Volume to Capacity	0.03	0.08	0.04	0.08
Queue Length 95th (ft)	0	6	0	6
Control Delay (s)	0.0	7.5	0.0	8.9
Lane LOS		A		A
Approach Delay (s)	0.0	5.0		8.9
Approach LOS				A

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	23.8%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX D

- 2017 Opening Day Conditions Analysis Worksheets

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	52	0	101	54	0	68
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	57	0	110	59	0	74
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			57		335	57
vC1, stage 1 conf vol					57	
vC2, stage 2 conf vol					278	
vCu, unblocked vol			57		335	57
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			93		100	93
cM capacity (veh/h)			1548		691	1010

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	57	110	59	74
Volume Left	0	110	0	0
Volume Right	0	0	0	74
cSH	1700	1548	1700	1010
Volume to Capacity	0.03	0.07	0.03	0.07
Queue Length 95th (ft)	0	6	0	6
Control Delay (s)	0.0	7.5	0.0	8.8
Lane LOS		A		A
Approach Delay (s)	0.0	4.9		8.8
Approach LOS				A

Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	56	0	109	57	0	71
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	61	0	118	62	0	77
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			61		360	61
vC1, stage 1 conf vol					61	
vC2, stage 2 conf vol					299	
vCu, unblocked vol			61		360	61
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			92		100	92
cM capacity (veh/h)			1542		672	1004

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	61	118	62	77
Volume Left	0	118	0	0
Volume Right	0	0	0	77
cSH	1700	1542	1700	1004
Volume to Capacity	0.04	0.08	0.04	0.08
Queue Length 95th (ft)	0	6	0	6
Control Delay (s)	0.0	7.5	0.0	8.9
Lane LOS		A		A
Approach Delay (s)	0.0	4.9		8.9
Approach LOS				A

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	23.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	67	10	14	57	4	74	15	65	27	151	449	93
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	73	11	15	62	4	80	16	71	29	164	488	101
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			6									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1002	949	488	933	1021	71	589			100		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1002	949	488	933	1021	71	589			100		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	60	95	97	70	98	92	98			89		
cM capacity (veh/h)	181	228	580	209	207	992	986			1493		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	99	147	16	71	29	164	488	101
Volume Left	73	62	16	0	0	164	0	0
Volume Right	15	80	0	0	29	0	0	101
cSH	221	369	986	1700	1700	1493	1700	1700
Volume to Capacity	0.45	0.40	0.02	0.04	0.02	0.11	0.29	0.06
Queue Length 95th (ft)	53	46	1	0	0	9	0	0
Control Delay (s)	34.7	21.1	8.7	0.0	0.0	7.7	0.0	0.0
Lane LOS	D	C	A			A		
Approach Delay (s)	34.7	21.1	1.2			1.7		
Approach LOS	D	C						

Intersection Summary			
Average Delay	7.1		
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	73	11	12	49	4	80	9	451	39	93	143	107
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	79	12	13	53	4	87	10	490	42	101	155	116
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			6									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	957	910	155	880	984	490	272			533		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	957	910	155	880	984	490	272			533		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	57	95	99	77	98	85	99			90		
cM capacity (veh/h)	183	246	890	234	223	578	1292			1035		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	104	145	10	490	42	101	155	116
Volume Left	79	53	10	0	0	101	0	0
Volume Right	13	87	0	0	42	0	0	116
cSH	218	363	1292	1700	1700	1035	1700	1700
Volume to Capacity	0.48	0.40	0.01	0.29	0.02	0.10	0.09	0.07
Queue Length 95th (ft)	59	46	1	0	0	8	0	0
Control Delay (s)	36.1	21.3	7.8	0.0	0.0	8.9	0.0	0.0
Lane LOS	E	C	A			A		
Approach Delay (s)	36.1	21.3	0.1			2.4		
Approach LOS	E	C						

Intersection Summary			
Average Delay	6.7		
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

1. The Old Rd & Magic Mountain Pkwy

	LANES	CAPACITY	AM PEAK HOUR VOL	AM PEAK HOUR V/C	PM PEAK HOUR VOL	PM PEAK HOUR V/C
NBL	2	3400	25	0.007	45	0.013 *
NBT	3	5100	291	0.057 *	373	0.073
NBR	1	1700	80	0.047	268	0.158
SBL	2	3400	151	0.044 *	494	0.145
SBT	3	5100	137	0.027	1366	0.268 *
SBR	1	1700	1	0.001	34	0.020
EBL	2	3400	28	0.008	81	0.024
EBT	4	6800	83	0.012 *	405	0.060 *
EBR	1	1700	2	0.001	133	0.078
WBL	2	3400	132	0.039 *	309	0.091 *
WBT	4	6800	88	0.013	143	0.021
WBR	f	0	1198	0.000	939	0.000
RIGHT TURN ADJUSTMENT					EBR	0.008 *
CLEARANCE INTERVAL				0.050 *		0.050 *
TOTAL ICU				0.202		0.490

*d = defacto right turn lane, f = free right turn lane

2. I-5 SB Ramps & Magic Mountain Pkwy

	LANES	CAPACITY	AM PEAK HOUR VOL	AM PEAK HOUR V/C	PM PEAK HOUR VOL	PM PEAK HOUR V/C
NBL	0	0	0	0.000	0	0.000
NBT	0	0	0	0.000	0	0.000
NBR	0	0	0	0.000	0	0.000
SBL	1.5	2550	303	0.119 *	282	0.111 *
SBT	0.5	850	1	0.001	0	0.000
SBR	2	3400	38	0.011	114	0.034
EBL	0	0	0	0.000	0	0.000
EBT	3	5100	199	0.039	811	0.159 *
EBR	2	3400	112	0.033	338	0.099
WBL	2	3400	550	0.162	360	0.106 *
WBT	4	6800	1376	0.202 *	1242	0.183
WBR	0	0	0	0.000	0	0.000
RIGHT TURN ADJUSTMENT						
CLEARANCE INTERVAL				0.050 *		0.050 *
TOTAL ICU				0.371		0.426

3. I-5 NB Ramps & Magic Mountain Pkwy

	LANES	CAPACITY	AM PEAK HOUR VOL	AM PEAK HOUR V/C	PM PEAK HOUR VOL	PM PEAK HOUR V/C
NBL	2	3400	1033	0.304 *	872	0.256 *
NBT	0.5	850	0	0.000	2	0.002
NBR	1.5	2550	593	0.233	739	0.290
SBL	0	0	0	0.000	0	0.000
SBT	0	0	0	0.000	0	0.000
SBR	0	0	0	0.000	0	0.000
EBL	2	3400	34	0.010 *	125	0.037
EBT	3	5100	514	0.101	956	0.187 *
EBR	0	0	0	0.000	0	0.000
WBL	0	0	0	0.000	0	0.000
WBT	3.5	5950	866	0.146 *	744	0.125
WBR	1.5	2550	230	0.090	407	0.160
RIGHT TURN ADJUSTMENT					NBR	0.050 *
CLEARANCE INTERVAL				0.050 *		0.050 *
TOTAL ICU				0.510		0.543

4. Tourney Rd & Magic Mountain Pkwy

	LANES	CAPACITY	AM PEAK HOUR VOL	AM PEAK HOUR V/C	PM PEAK HOUR VOL	PM PEAK HOUR V/C
NBL	2	3400	160	0.047 *	275	0.081 *
NBT	0	0	0	0.000	0	0.000
NBR	1	1700	47	0.028	324	0.191
SBL	0	0	0	0.000	0	0.000
SBT	0	0	0	0.000	0	0.000
SBR	0	0	0	0.000	0	0.000
EBL	0	0	0	0.000	0	0.000
EBT	3	5100	803	0.157 *	1494	0.293 *
EBR	1	1700	309	0.182	203	0.119
WBL	1	1700	404	0.238 *	137	0.081 *
WBT	3	5100	923	0.181	873	0.171
WBR	0	0	0	0.000	0	0.000
RIGHT TURN ADJUSTMENT					NBR	0.041 *
CLEARANCE INTERVAL				0.050 *		0.050 *
TOTAL ICU				0.492		0.546

CHRISTOPHER JEAN & ASSOCIATES, INC.
ACOUSTICAL CONSULTING SERVICES

August 17, 2016

ACOUSTICAL ANALYSIS

VALENCIA SPRINGHILL & RESIDENCE INN

WAYNE MILLS PLACE

CITY OF SANTA CLARITA

Prepared by:

Christopher Jean, INCE

Prepared for:

MR. NEIL PATEL
EXCEL HOTEL GROUP
10660 Scripps Ranch Blvd., Suite 100
San Diego, California 92131

P. O. BOX 2325 • FULLERTON, CALIFORNIA • 92837
PHONE: 714-805-0115

CHRISTOPHER JEAN & ASSOCIATES, INC.
ACOUSTICAL CONSULTING SERVICES

SUMMARY

This analysis has been completed to determine the exterior and interior noise exposure and the necessary mitigation measures for the proposed Valencia Springhill & Residence Inn off of Wayne Mills Place in the City of Santa Clarita. A list of requirements and recommendations is given in the following summary. Details are discussed in the body of the report.

A. EXTERIOR NOISE CONTROL

Sound walls at least six feet (6') high must be erected between the Residence Inn entry portico and the adjacent pool area. Sound walls at least ten feet (10') high must be erected around the west end of the Holiday Inn pool area.

B. NOISE CONTROL BARRIER CONSTRUCTION MATERIALS

The required noise control barriers may be constructed using any of the following materials:

(1) Masonry block

(2) Stucco on wood frame

(3) 3/4" plywood

(4) 1/4" tempered glass or 1/2" Lexan

(5) Earthen berm

(6) Any combination of the above materials or any material with a surface weight of at least 3.5 pounds per square foot.

Each completed noise control barrier must present a solid face from top-to-bottom and end-to-end. Cutouts are not permitted except for drain holes.

P. O. BOX 2325 • FULLERTON, CALIFORNIA • 92837
PHONE: 714-805-0115

C. INTERIOR NOISE CONTROL

The buildings shall be constructed, as a minimum, in accordance with the outline of Table 7 found in the body of the report. This will be adequate for all units with the following upgrades:

(1) Add STC 40 glazing to all rooms along the west face of both buildings.

(2) Add STC 36 glazing to all rooms along the north and south building faces of both buildings.

(3) Add STC 28 glazing to all remaining rooms of both buildings including all rooms facing the central courtyard of the Residence Inn building.

(4) Add resilient channels and two layers 5/8" drywall to the exterior wall assemblies of all rooms along the west, north and south building faces of both buildings.

(5) Add resilient channels and two layers 5/8" drywall to the ceilings of all top floor rooms along the west, north and south building faces of both buildings.

D. VENTILATION

This analysis assumed that all windows and doors are kept closed. If the allowable interior noise levels are met by requiring that windows and doors be kept closed, then the design of the structure must also specify a ventilation or air conditioning system to provide a habitable interior environment. The ventilation system must not compromise the dwelling or guest room noise reduction.

E. UNIT-TO-UNIT NOISE CONTROL

Common floor/ceiling assemblies between units are subject to Title 24 Sound Transmission Class (STC) and Impact Insulation Class (IIC) requirements. The plan set provided for this analysis did not include common floor/ceiling assembly details. It is highly recommended that one of the following widely used common floor/ceiling assemblies, all of which rate at least STC 50, be incorporated into the building plans:

(1) 8" concrete slab (Riverbank Acoustical Labs, TL 76-77, 1977, 16f, for Pre-stressed Concrete Institute, STC 58 – IIC 71 with carpet, IIC 34 for bare floor)

(2) 1 1/2" lightweight concrete, plywood sub-floor, 3 1/2" thick fiberglass insulation, resilient channels, drywall ceiling (Geiger and Hamme CCA-14MT, CCA-15MT, 1972, 16f, for Cellular Concrete Association, STC 60 – IIC 73 with carpet, IIC 47 with vinyl tile)

(3) 1 3/8" Gyp-Crete, plywood sub-floor, 2" by 10" wood joists, 3 1/2" thick fiberglass insulation, resilient channels, 1/2" drywall ceiling (Riverbank Acoustical Labs TL 81-16,

for Gyp-Crete Corporation, 1981, STC 60 – Riverbank Acoustical Labs IN 81-14, for Gyp-Crete Corporation, 1981, IIC 51 with sheet vinyl)

As can be seen by the above list, some of the recommended assemblies cannot meet the IIC 50 minimum requirement without carpet. Uncarpeted areas above other living units will require some form of proprietary isolation product included in the assembly to achieve the required rating. Such products include Enkasonic, Acousti-Mat, Regupol and others. Such products are designed to be installed atop the bare sub-floor and topped with either lightweight concrete/Gyp-Crete pour or additional layers of plywood. Each product has its own specific installation requirements. These products can produce both design and field IIC compliance with sheet vinyl or wood flooring. While various lab tests have shown these same products to produce design IIC compliance when used with ceramic tile, field testing experience has proven that actual ceramic tile installations are marginal. The use of ceramic tile or marble is not recommended, regardless of the installation method.

The plan set provided for this analysis did not include common wall assembly details. It is highly recommended that one of the following widely used common wall assemblies, all of which rate at least STC 50, be incorporated into the building plans:

(1) Two layers of 1/2" direct nailed drywall, 2" by 6" plate, 2" by 4" staggered studs, 3 1/2" thick fiberglass insulation, two layers 1/2" direct nailed drywall (Owens/Corning Fiberglas, OCF W-55-69, 1969, 16f, for Owens/Corning Fiberglas, STC 54)

(2) Two layers of 5/8" direct nailed drywall, 2" by 6" plate, 2" by 4" staggered studs, 3 1/2' thick fiberglass insulation, two layers 5/8" direct nailed drywall (National Gypsum Company NGC 2376, 1970, 16f, STC 53)

(3) 5/8" direct nailed drywall, 2" by 4" plate with 2" by 4" studs, 3 1/2" thick fiberglass insulation, 1" clear air space at plate, 2" by 4" plate with 2" by 4" studs, 5/8" direct nailed drywall (Owens/Corning Fiberglas OCF 448, 1967, 16f, STC 56)

(4) Same as #3 but with two layers of 3 1/2" thick fiberglass insulation (Riverbank Acoustical Labs TL 75-83, 1975, 16f, for U. S. Department of Agriculture, STC 57)

(5) Two layers 5/8" direct nailed drywall, 2" by 4" plate with 2" by 4" studs, 3 1/2" thick fiberglass insulation, 1" clear air space at plate, 2" by 4" plate with 2" by 4" studs, two layers 5/8" direct nailed drywall (National Gypsum Company, NGC 3056, 1970, 16f, for Gypsum Association, STC 58)

(6) Same as #5 but with two layers of 3 1/2" thick fiberglass insulation (Riverbank Acoustical Labs TL 75-82, 1975, 16f, for U. S. Department of Agriculture, STC 63)

All wall assemblies between any common space and a living unit must be an STC 50 minimum rated assembly. All plumbing, mechanical and electrical installations shall be installed per the instructions and details contained in Appendix 7. Add all appropriate details to the project plans.

F. PROJECT DISCLOSURE

The acoustical code requirements represent minimal acceptable standards. Compliance with the Building Department acoustical criteria does not require, guarantee or even imply that local sound sources will be mitigated to inaudibility. Compliance with an exterior noise limit of 65 dBA CNEL means that exterior noise will remain clearly audible within the mitigated exterior space. Compliance with an interior noise limit of 45 dBA CNEL means that exterior noise sources will remain audible on the interior of a building.

Due to quality control and other field related problems, the code minimum laboratory ratings of STC/IIC 50 for common assemblies does not guarantee that all common assemblies will pass a field test. In fact, there is a 50 percent chance that half of all common assemblies rated at the STC/IIC minimum could fail field tests. An STC 50 rated assembly will produce around 45 dBA of voice reduction in the field. This means that normal conversation in adjoining units will be audible a certain percentage of the time.

Do not misrepresent the degree of exterior to interior or unit-to-unit acoustical isolation as anything more than meeting code during any phase of this project. Never, ever, use any form of the term "Soundproof" to describe any portion of this project.

G. PROJECT NOISE MITIGATION

Project generated noise levels should not exceed the existing ambient conditions as longs as no truck deliveries occur prior to 7:00 a.m. or after 10:00 p.m., all rooftop mechanical equipment has a specified noise rating of no more than 8.5 bels, rooftop parapet or freestanding acoustic screen walls at least as tall as the tallest piece of rooftop mechanical equipment are erected, and all guest room HVAC units have a specified noise rating of no more than 6.5 bels.

H. CONSTRUCTION NOISE

Construction noise is normally exempt from compliance with the City noise limits. However, even unrestricted construction activities are not likely to exceed the ambient noise conditions produce by the adjacent freeway.

CHRISTOPHER JEAN & ASSOCIATES, INC.
ACOUSTICAL CONSULTING SERVICES

1.0 INTRODUCTION

This report presents the results of a noise impact and design study of the proposed Valencia Springhill & Residence Inn project located off of Wayne Mills Place in the City of Santa Clarita. This report includes a discussion of the expected exterior community noise environment and the recommendations for control of noise in the exterior and interior living spaces.

A vicinity map showing the general location of the project site is presented in Exhibit 1 – Site Location Map. An aerial photograph of the existing project site and its surroundings is shown on Exhibit 2. The project site plan is shown on Exhibit 3. The project consists of two hotel buildings.

2.0 APPLICABLE NOISE CRITERIA

The City of Santa Clarita requires all hotel projects to conform to the requirements of Table 1.

TABLE 1

APPLICABLE NOISE CRITERIA (1)

Exterior	65 dBA CNEL
Interior	45 dBA CNEL
Unit-to-Unit	STC 50/IIC 50

(1) Please see Noise Rating Methods (Appendix 1) for an explanation of the commonly applicable acoustical terminology.

The City of Santa Clarita also has a noise ordinance designed to control noise across common property lines. The allowed noise limits for both residential (other hotels in this case) and commercial properties are listed in Table 2 on the following page.

P. O. BOX 2325 • FULLERTON, CALIFORNIA • 92837
PHONE: 714-805-0115

TABLE 2

MUNICIPAL CODE NOISE LIMITS

DURATION	SYMBOL	RESIDENTIAL DAY	RESIDENTIAL NIGHT	COMMERCIAL DAY	COMMERCIAL NIGHT
More than 15 minutes in hour	L25	65	55	80	70
More than 5, less than 15 minutes	L8	70	60	85	75
More than 1, less than 5 minutes	L2	75	65	90	80
Less than 1 minute	Lmax	85	75	100	90

As can be seen from the Table 2 criteria, the noise limits will be most stringent when applied to continuous noise sources such as rooftop mechanical equipment and guest room air conditioning units. Intermittent noise caused by daytime truck deliveries and typical parking lot activities should be able to comply with the various noise limits without much effort, especially due to the high ambient noise levels in the project area (Interstate 5).

In addition, the City noise ordinance exempts construction noise produced within 300 feet of a residential property as long as it occurs only between the hours of 7:00 a.m. to 7:00 p.m. Monday through Friday, and 8:00 a.m. to 6:00 p.m. on Saturday.

3.0 EXISTING NOISE LEVELS

3.1 ROADWAYS

A measurement was performed on the site. The measurement was conducted using a Larson-Davis Model 700 Integrating Sound Level Meter. The average noise level reported from the measurement taken at a point approximately 150 feet from the centerline of Interstate 5 was 79 dBA Leq.

Ten minute traffic counts were taken during the measurement period. The results of the counts are listed in Table 3 on the following page.

TABLE 3

OBSERVED INTERSTATE 5 TRAFFIC COUNTS

	AUTOS	MEDIUM TRUCKS	HEAVY TRUCKS	TOTAL
TEN MINUTES	1,365	44	133	1,542
HOURLY EQUIVALENT	8,190	264	798	9,252
PERCENTAGE	88.5	2.9	8.6	100.0

The primary function of the measurements is to calibrate the Noise Model (FHWA RD-77-108) used to compute the CNEL data. The model relies on the acoustical metric of the average noise level (Leq). By taking the traffic count during the measurement, calculating the Leq value for that traffic sample, and comparing it the measured Leq value, it is possible to calibrate the CNEL model for any factors that are present and not adequately identified in the prediction equations.

The Leq value computer calculation printout is contained in Appendix 2. The calculated and measured Leq values are compared in Table 4.

TABLE 4

COMPARISON OF CALCULATED AND MEASURED AVERAGE NOISE LEVELS

Calculated	82
Measured	79
DIFFERENCE	- 3

The results of Table 4 show that area conditions produce slightly noise than would normally be predicted by the standard computer calculation model. The resulting correction factor will be applied to the design noise level (CNEL) calculations.

3.2 RAILROAD

There are no railroad operations in the vicinity of the project site. Railroad noise does not impact the site.

3.3 AIRCRAFT

There are no concentrated aircraft operations in the vicinity of the project site. Aircraft noise does not impact the site.

4.0 DESIGN NOISE LEVELS

4.1 ROADWAY

The expected future roadway noise impact was projected using the Federal Highway Administration's Highway Noise Prediction Model (FHWA RD-77-108) together with several roadway and site parameters that determine the projected impact of vehicular traffic noise. These include the roadway cross-section (e.g. number of lanes), the roadway active width, the average daily traffic (ADT), the vehicle travel speed, the percentage of auto and truck traffic, the roadway grade, the angle of view, the site conditions ("hard" or "soft" site), and the percentage of average daily traffic that flows each hour throughout a 24 hour period.

The forecast traffic volume was obtained from Caltrans data. CALTRANS data was also used for the percentage of truck traffic and to project the distribution by time of day. The input data is listed in Table 5.

TABLE 5

TRAFFIC INPUT DATA – I-5 FREEWAY

	% DAY	% EVENING	% NIGHT	% VOLUME
Autos	73.00	8.60	18.40	87.4
Medium Trucks	73.00	8.60	18.40	2.8
Heavy Trucks	69.10	6.70	24.20	9.8

Volume = 188,000 ADT on

Speed = 65 MPH

The calculations are contained in Appendix 3. The calculations, with the Table 4 correction factor applied, yield a design noise level of 83 dBA CNEL at 150 feet from the centerline of the I-5 Freeway.

4.2 RAILROAD

Railroad noise is not expected to increase. Thus, railroad noise will not impact the project site.

4.3 AIRCRAFT

Aircraft noise is not expected to increase. Thus, aircraft noise will not impact the project site.

5.0 MITIGATION MEASURES

5.1 EXTERIOR

The project proposes two exterior use areas. The Residence Inn hotel proposes a central courtyard including a pool area. The proposed building will partially shield this courtyard from freeway noise although the entrance opening in the west side of the building will allow freeway noise to encroach upon this space. The Holiday Inn also proposes an exterior pool area between the two hotel buildings. While the two buildings will partially shield this pool area from freeway noise, the west side of this pool area is open to the freeway. As exterior noise levels are expected to be as high as 83 dBA CNEL outside the west building faces, mitigation of exterior noise would require a sound barrier along the west sides of both pool areas. For purposes of analysis, the barrier height calculations assume that the barrier is located at the top of any slope between the roadway and building pads, and is only intended to reduce exterior noise to 65 dBA CNEL at the first floor level. The assumptions for the barrier height calculations are listed in Table 6 on the following page.

TABLE 6

BARRIER ANALYSIS GENERAL ASSUMPTIONS
FOR RECEIVER AND SOURCE GEOMETRY

RECEIVER ASSUMPTIONS	
HORIZONTAL GEOMETRY	**VERTICAL GEOMETRY**
Distance behind top-of-roadways barrier: 5' to 10'	Height above pad for ground level receivers: 5'
Distance behind individual patio and balcony barriers: 1' to 3'	Height above pad for second level receivers: 14'

SOURCE ASSUMPTIONS		
HORIZONTAL GEOMETRY *	**VERTICAL GEOMETRY**	
For roadways with grades no greater than 2%, all vehicles were located at the single lane equivalent acoustic center of the full roadway. For roadways with over 2% grade, vehicle count was divided in half and located at the single lane equivalent acoustic center for each side of the roadway.	Automobiles:	0' above center of road grade
	Medium Trucks:	2.3' above center of road grade
	Heavy Trucks:	8' above center of road grade

* = Single Lane Equivalent (SLE) location.

The barrier calculations are contained in Appendix 4. These calculations show that barriers at least six feet (6') high must be erected between the Residence Inn entry portico and the adjacent pool area. The barrier calculations also show that a sound barrier at least ten feet (10') high must be erected around the west end of the Holiday Inn pool area.

The required noise control barriers may be constructed using any of the following materials:

(1) Masonry block

(2) Stucco on wood frame

(3) 3/4" plywood

(4) 1/4" tempered glass or 1/2" Lexan

(5) Earthen berm

(6) Any combination of the above materials or any material with a surface weight of at least 3.5 pounds per square foot.

Each completed noise control barrier must present a solid face from top-to-bottom. Cutouts and/or openings are not permitted except for drain holes.

5.2 INTERIOR

The City's exposure criteria for new hotel construction require that the interior noise environment, attributable to outside noise sources, be limited to 45 dBA CNEL. Analysis and recommendations for control of outdoor-to-indoor noise intrusion are presented in this section.

The exterior-to-interior noise reduction expected for the planned construction was based on a detailed analysis of sample rooms and units planned for the development. Calculations of the expected typical noise reduction performance were performed for sample rooms. The analysis was based on the typical spectra expected for the primary sources of community noise impact, the typical octave-band transmission loss for each element in the planned building shell, the relative square footage of each element of the planned building shell, the expected typical interior surface treatment, and the acoustical absorption coefficient for each interior surface treatment. Corrections for the "A" Weighted room absorption factors are also included.

Each component of the building shell (e.g. exterior wall, windows, doors, etc.) provides a different amount of transmission loss for each "A" Weighted octave- band of community noise. With the knowledge of the building shell components and their individual octave band transmission loss values for the noise sources, calculations of the composite building shell transmission loss can be made for each room.

The characteristics of the basic building shell are listed in Table 7 on the following page.

TABLE 7

BASIC BUILDING SHELL CHARACTERISTICS

PANEL	CONSTRUCTION
Exterior Wall	Siding or stucco, 2" X 4" studs, R-13 fiberglass insulation, 5/8" drywall
Windows	Double pane
Sliding Glass Door	Double pane
Roof	Built-up over 1/2" plywood, R-30 fiberglass insulation, 5/8" drywall
Floor	Carpeted except baths

Table 7 construction minimums will provide around 20 dBA of interior noise reduction.

For convenience of assessment, the specific noise levels at the building faces are given in Table 8.

TABLE 8

NOISE LEVELS AT THE BUILDING FACES

	FACE			
	NORTH	EAST	SOUTH	WEST
Residence Inn	79	70	80	82
Holiday Inn	80	70	80	83

The results of Table 8 show that interior noise reduction levels as high as 38 dBA will be required for rooms facing Interstate 5. Since Table 7 construction will yield only around 20 dBA, specific room calculations were carried out to determine whether additional mitigation is needed.

The calculations are contained in Appendix 5, and the results are given in Table 9 on the following page.

TABLE 9

ROOM NOISE REDUCTION VALUES

BLDG	ROOM	NOISE REDUCTION VS. GLAZING STC 24	26	28	30	32	34	36	38	40
Res Inn	Studio/1 Bedroom	23	24	26	27	28	29	29	30	30
	Double Queen	26	27	28	28	29	29	29	29	29
	King	26	28	29	30	31	31	32	32	32
Hol Inn	King	25	27	28	28	29	29	29	29	30
	Double Queen	24	25	27	28	29	30	30	31	31

The results of Table 9 show that Table 7 construction cannot provide the required 38 dBA of interior noise reduction even with significant glazing upgrades. It will be necessary to upgrade the exterior walls and roof/ceiling assemblies. Such upgrades will consist of adding resilient channels to the interior side of the wall studs plus two layers of 5/8" drywall. Similarly, the roof/ceiling assembly (top floor only) can be upgraded by adding resilient channels to the ceiling joists plus two layers of 5/8" drywall.

Additional interior noise reduction calculations were performed to determine the effect of the exterior wall and roof/ceiling upgrades. The calculations are contained in Appendix 6 and the results are given in Table 10.

TABLE 10

ROOM NOISE REDUCTION VALUES
WITH EXTERIOR WALL AND ROOF/CEILING UPGRADES

BLDG	ROOM	NOISE REDUCTION VS. GLAZING STC 24	26	28	30	32	34	36	38	40
Res Inn	Studio/1 Bedroom	23	25	27	29	31	33	34	36	37
	Double Queen	28	30	32	33	35	36	37	38	38
	King	28	29	31	33	35	36	38	39	40
Hol Inn	King	27	29	31	33	34	35	37	38	38
	Double Queen	25	27	28	30	32	34	35	37	38

(1) Add STC 40 glazing to all rooms along the west face of both buildings.

(2) Add STC 36 glazing to all rooms along the north and south building faces of both buildings.

(3) Add STC 28 glazing to all remaining rooms of both buildings including all rooms facing the central courtyard of the Residence Inn building.

(4) Add resilient channels and two layers 5/8" drywall to the exterior wall assemblies of all rooms along the west, north and south building faces of both buildings.

(5) Add resilient channels and two layers 5/8" drywall to the ceilings of all top floor rooms along the west, north and south building faces of both buildings.

5.3 VENTILATION

If interior allowable noise levels are met by requiring that windows be unopenable or remain closed, then the design of the structure must also specify a ventilation or air conditioning system to provide a habitable interior environment. The ventilation system must not compromise the dwelling unit or guest room noise reduction.

5.4 UNIT-TO-UNIT NOISE CONTROL

Common floor/ceiling assemblies between units are subject to Title 24 Sound Transmission Class(STC) and Impact Insulation Class (IIC) requirements. The plan set provided for this analysis did not include common floor/ceiling assembly details. It is highly recommended that one of the following widely used common floor/ceiling assemblies, all of which rate at least STC 50, be incorporated into the building plans:

(1) 8" concrete slab (Riverbank Acoustical Labs, TL 76-77, 1977, 16f, Pre-stressed Concrete Institute, STC 58 -- IIC 71 with carpet, IIC 34 for bare floor)

(2) 1 1/2" lightweight concrete, sub-floor, R-11 insulation, resilient channel, drywall ceiling (Geiger and Hamme CCA-14MT, CCA-15MT, 1972, 16f, Cellular Concrete Associates, STC 60 --IIC 73 with carpet, IIC 47 with vinyl tile)

(3) 1 3/8" Gyp-Crete, sub-floor, 2" by 10" joists, R-11 insulation, resilient channel, 1/2" drywall ceiling (Riverbank Acoustical Labs TL 81-16, Gyp-Crete Corp., 1981, STC 60 -- Riverbank Acoustical Labs IN 81-14, Gyp-Crete Corp., 1981, IIC 51 with sheet vinyl)

As can be seen by the above list, some of the recommended assemblies cannot meet the IIC 50 minimum requirement without carpet. Uncarpeted areas above other living units will require some form of proprietary isolation product under the floor to achieve the required rating. Such products include Enkasonic, Acousti-Mat, Monsanto SC50, and others. Such products are designed to be installed atop the bare sub-floor and topped with either a LWC/Gyp-Crete pour or additional layers of plywood. Each product has its own specific installation requirements. These products can produce both design and field IIC compliance with sheet vinyl or wood flooring. While various lab tests have shown these same products to produce design IIC compliance when used with ceramic tile, field testing experience has proven that actual ceramic tile installations are marginal. The use of ceramic tile or marble flooring is not recommended, regardless of the installation method.

The plan set provided for this analysis did not include common wall assembly details. It is highly recommended that one of the following widely used common wall assemblies, all of which rate at least STC 50, be incorporated into the building plans:

(1) Two layers 1/2" direct nailed drywall, 2" by 6" plate, 2" by 4" staggered studs, fiberglass insulation, two layers 1/2" direct nailed drywall (Owens/Corning Fiberglas, OCF W-55-69, 1969, 16f, Owens/Corning Fiberglas, STC 54)

(2) Two layers 5/8" direct nailed drywall, 2" by 6" plate, 2" by 4" staggered studs, R-11 insulation, two layers 5/8" direct nailed drywall (National Gypsum Co. NGC 2376, 1970, 16f, STC 53)

(3) 5/8" direct nailed drywall, 2" by 4" plate with 2" by 4" studs, R-11 insulation, 1" airspace at plate, 2" by 4" plate with 2" by 4" studs, 5/8" direct nailed drywall (Owens/Corning Fiberglas OCF 448, 1967, 16f, STC 56)

(4) Same as #3 with two layers of R-11 insulation (Riverbank Acoustical Labs TL75-83, 1975, 16f, U.S. Department of Agriculture, STC 57)

(5) Two layers 5/8" drywall direct nailed, 2" by 4" plate with 2" x 4" studs, 1" air space, 2" by 4" plate with 2" by 4" studs, R-11 insulation, two layers 5/8" drywall (National Gypsum Co. NGC 3056, 1970, 16f, Gypsum Association, STC 58)

(6) Same as #5 with two layers of R-11 insulation (Riverbank Acoustical Labs TL 75-82, 1975, 16f, U.S. Department of Agriculture, STC 63)

All wall assemblies between any common space and a living unit must be an STC 50 minimum rated assembly. All Plumbing and electrical installations shall be installed per the instructions contained in Appendix 7. Put all details onto Plans.

5.5 PROJECT DISCLOSURE

The acoustical code requirements are minimal acceptable standards. Compliance with Building Department acoustical criteria does not require, guarantee or even imply that local sound sources will be mitigated to inaudibility. Compliance with an exterior noise limit of 65 dBA CNEL means that exterior noise will remain clearly audible within the mitigated exterior space. Compliance with an interior noise limit of 45 dBA CNEL means that exterior noise sources will remain audible on the interior of a structure.

Due to quality control and other field related problems, the code minimum laboratory rating of STC/IIC 50 for common assemblies does not guarantee that all common assemblies will pass a field test. In fact, there is a 50% chance that half of all laboratory rated STC/IIC 50 common assemblies could fail field tests. An STC 50 rated assembly will produce around 45 dBA of voice reduction in the field. This means that normal conversation in adjoining units will be audible a certain percentage of the time.

Do not misrepresent the degree of exterior to interior or unit to unit acoustical isolation as anything more than meeting code during any phase of this project. Never, ever, use any form of the term "Soundproof" to describe any portion of this project.

6.0 PROJECT GENERATED NOISE

Once completed, the operations of the two hotel buildings will generate noise from various sources. Such sources include, motor vehicles moving on and off the project site, truck deliveries, rooftop mechanical units and individual guest room HVAC units, and even people's voices. These various noise sources will combine at the project boundaries and must comply with the City noise limits. This section will examine the various noise sources and compare the combined source noise levels at the project boundaries to the City noise limits.

6.1 PARKING LOT ACTIVITY

Patron and employee vehicles will enter and exit the project site as well as maneuver around the project parking areas once on site. Field measurement experience has shown that a cycle of people entering a parked vehicle, slamming the doors, starting the engine, maneuvering out of the parking space and driving away, immediately followed by another vehicle pulling up, maneuvering into the parking space, shutting off the engine, people exiting the vehicle and slamming the doors produces an average noise level of 68 dBA Leq at a distance of 10 feet. Maximum noise levels are typically 10 dBA higher or 78 dBA max at 10 feet. The analysis has shown that future traffic noise levels from Interstate 5 will be as high as 70 dBA CNEL on the east side of the project site. This means that typical parking lot activities will produce less noise than the adjacent freeway.

6.2 TRUCK DELIVERIES

Deliveries of various products such as linens, toiletries, food and such will be made periodically. Most such deliveries will be made by smaller trucks such as those used by UPS or FedEx. However, larger deliveries could also be made by tractor-trailer rigs. Typical noise sources and levels are given in Table 11.

TABLE 11

TRUCK DELIVERY NOISE LEVELS

SOURCE	DBA @ 10'	DURATION
Truck engine idle	68	15 minutes
Moving Truck (under 10 mph)	76	1 minute
Air brakes	94	8 seconds
Unloading noise	72	15 minutes

The Exhibit 3 site plan shows truck unloading areas on the east side of the Residence in building as well as on the south side of the Holiday Inn Express Building. The unloading area on the east side of the Residence Inn building is about 100 feet from the common property line of the existing hotel (residential) use to the north and about 45 feet from the common property line of the commercial use to the east. These distances would reduce the Table 11 source noise levels by 20 dBA to the north and 13 dBA to the east. This results in 15 minute noise levels of 53 dBA to the north and 60 dBA to the east. Both are well under the allowed L25 noise limits of Table 2. Moving trucks must pass the hotel use to the north creating noise levels similar to the allowed daytime noise limit. Only air brakes have the potential to violate the allowed noise limits. However, air brake noise from trucks delivering to the project hotels will be indistinguishable from air brake noise from trucks delivering to the existing hotel.

6.3 ROOFTOP MECHANICAL/GUEST ROOM HVAC UNITS

Both project buildings will employ rooftop mechanical units as well as individual HVAC units for each guest room. Since noise from such equipment is typically continuous, the combined noise levels from such units must comply with the base noise limits of Table 2 at the adjacent properties. Rooftop mechanical plans were not available for this analysis. For purposes of analysis, each building will be assumed to have 10 rooftop mechanical units, all rated at 9.0 bels (70 dBA at 10 feet). If all ten of these units were located in a cluster approximately 30 feet from the common property line to the north, a combined continuous level of 70 dBA would occur. Rooftop parapet walls at least as tall as the tallest piece of equipment would reduce this level at least 5 dBA. Specifying a maximum manufacturer noise rating of 8.5 bels (65 dBA at 10 feet) would reduce the rooftop mechanical noise by another 5 dBA. Assuming that rooftop parapet walls are used and no rooftop equipment produces more than 65 dBA at 10 feet, the worst-case rooftop noise level at the existing hotel property to the north will be 60 dBA. Even this mitigated level exceeds the nighttime residential use noise limit of Table 2.

Noise from guest room HVAC units will be defined by the nearest 12 units to a single receiver point. If each guest room HVAC unit produces 7.5 bels (55 dBA at 10 feet), then the nearest 12 units to any point on the common property line of the existing hotel use to the north will produce a combined level of 82 dBA. Specifying units with a sound rating of only 6.5 bels would produce a combined level of 72 dBA. Even this mitigated level exceeds the nighttime residential noise limit of Table 2.

The analysis has shown that even mitigated noise from the building mechanical systems will likely exceed the City noise limits. However, freeway noise levels as high as 80 dBA CNEL will occur along the north side of the Residence Inn building. Thus, a building mechanical noise level of 72 dBA will be below the ambient noise levels produced by the freeway. To ensure that this situation remains the case, the project should specify a rooftop mechanical unit maximum allowable noise rating of 8.5 bels and the use of rooftop parapet or freestanding acoustical screen walls at least as tall as the tallest piece of rooftop equipment. Likewise, a maximum allowable noise rating of 6.5 bels should be specified for all guest room HVAC units.

7.0 CONSTRUCTION NOISE

Construction noise is expressly exempted from compliance with the City noise limits as long as all construction activity is restricted to between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday, and between 8:00 a.m. and 6:00 p.m. on Saturday. Construction noise should not occur on Sundays and/or holidays. It should be noted that, due to the extremely loud ambient noise levels produced by the adjacent freeway, construction noise is not likely to exceed the ambient noise conditions on a frequent basis.

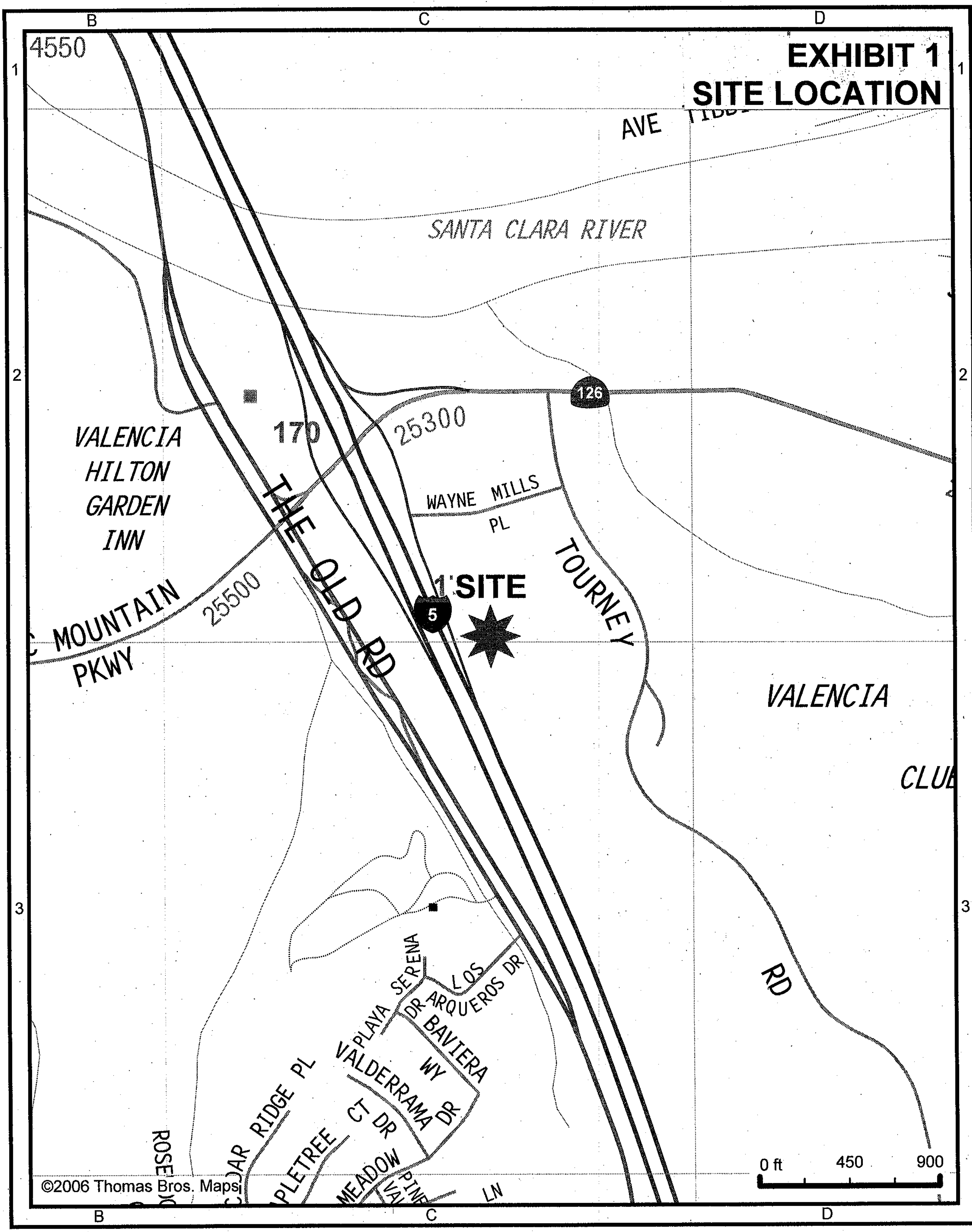


EXHIBIT 1
SITE LOCATION
4550
B
C
D
1
2
3
AVE
SANTA CLARA RIVER
126
25300
170
VALENCIA
HILTON
GARDEN
INN
WAYNE MILLS
PL
THE OLD RD
SITE
5
TOURNEY
RD
MOUNTAIN
PKWY
25500
VALENCIA
SERENA
LOS
ARQUEROS DR
PLAYA
DR
BAVIERA
WY
VALDERRAMA
DR
RIDGE PL
CT DR
MEADOW
LN
0 ft
450
900
©2006 Thomas Bros. Maps

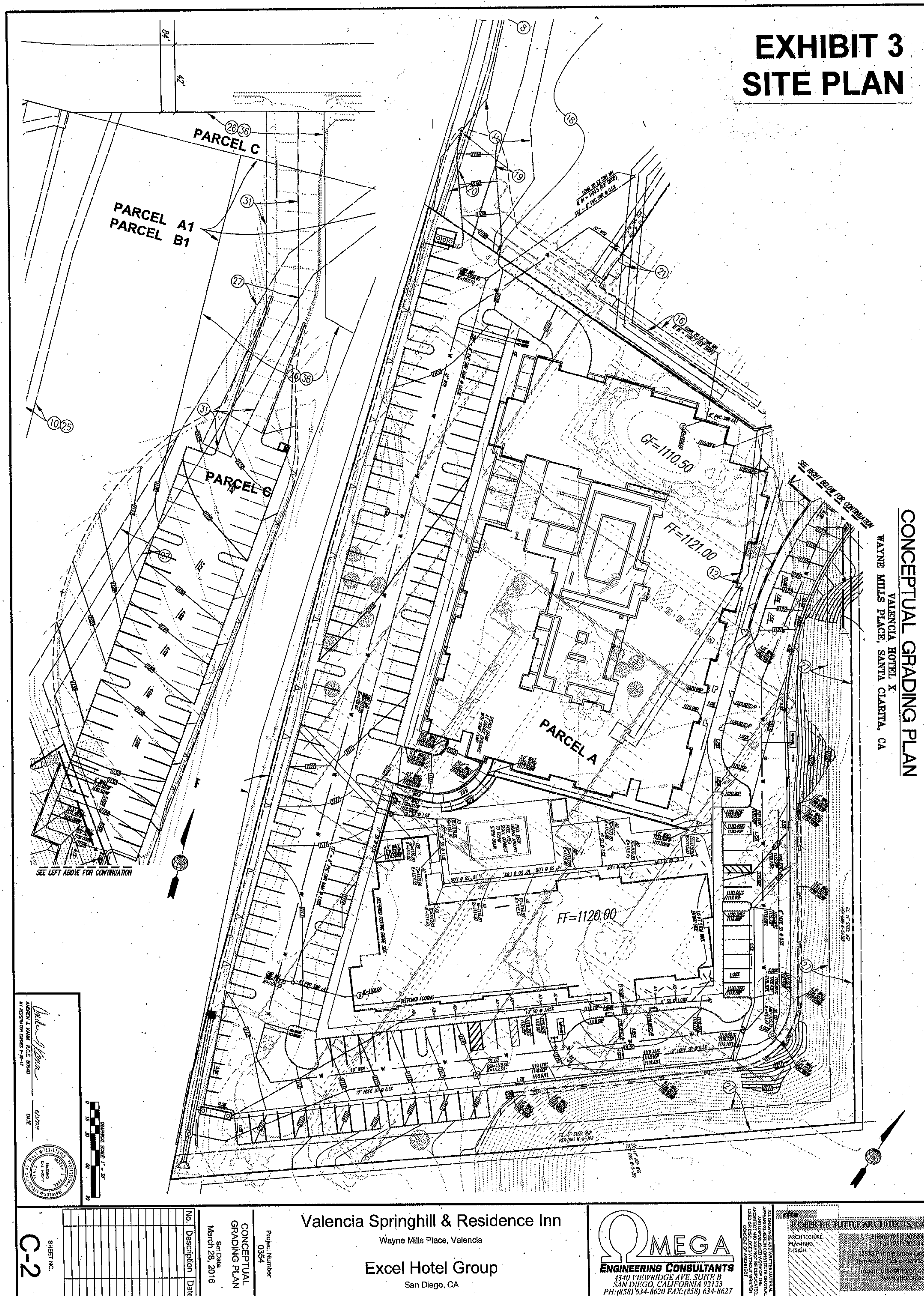
SITE: 4550 - C2

Google Maps Valencia Springhill & Residence Inn

EXHIBIT 2
AERIAL PHOTO

Imagery ©2016 DigitalGlobe, U.S. Geological Survey, USDA Farm Service Agency, Map data ©2016 Google 100 ft

EXHIBIT 3
SITE PLAN



CHRISTOPHER JEAN & ASSOCIATES, INC.
ACOUSTICAL CONSULTING SERVICES

APPENDIX 1

NOISE RATING METHODOLOGY

P. O. BOX 2325 • FULLERTON, CALIFORNIA • 92837
PHONE: 714-805-0115

CHRISTOPHER JEAN & ASSOCIATES, INC.
ACOUSTICAL CONSULTING SERVICES

NOISE RATING METHODOLOGY

The A-weighted decibel (dBA) or "A" scale on a sound level meter is typically used for environmental noise measurements because the weighting characteristics of the "A" scale approximate the subjective response of the human ear to a broad frequency band noise source by discriminating against the very low and very high frequencies of the audible sound spectrum.

Since community noise is seldom constant, varying from moment to moment and throughout the day, the "A" weighted noise level needs to be further described to provide meaningful data. The Environmental Protection Agency, the Federal Department of Transportation, several foreign countries and many private consultants are now using three time-exceeded percentile figures to describe noise, which are:

(1) L_{90} is the noise level that is exceeded 90 percent of any sample measurement period (such as 24 hours) and is often used to describe the background or ambient noise level.

(2) L_{50} is the noise level that is exceeded 50 percent of any sample measurement period. It is generally considered to represent the median noise level.

(3) L_{10} is the noise level that is exceeded 10 percent of any sample measurement period. It is a good descriptor of fluctuating noise sources such as vehicular traffic. It indicates the near-maximum noise levels that occur for groups of single noise events. Being related to the subjective annoyance to community noise, the L_{10} is a good design tool in the planning of acoustical barriers.

More recent noise assessment methods are based on the equivalent energy concept where Leq(x) represents the average energy content of a fluctuating noise source over a sample measurement period. The subscript (x) represents the period over which the energy is computed and/or measured. Current practice references the time quantity to either one (1) hour, eight (8) hours, or twenty-four (24) hours. When referenced to one (1) hour, Leq is also called the HNL (Hourly Noise Level).

P. O. BOX 2325 • FULLERTON, CALIFORNIA • 92837
PHONE: 714-805-0115

Since Leq is the summation of the functional products of noise level and duration, many different combinations of noise levels, duration times and time histories can produce similar Leq values. Thus a value of Leq(24) equals 50 means only that the average noise level is 50 dB. During that 24-hour period, there can be times when the noise level is higher than 50 dB and times when it is lower than 50 dB.

If the period of the measurement is only a single event, the energy content is not averaged. The energy expression for a single event is simply the sum of the functional product of the noise level and duration time of the event. This term is called the Le or SENEL (Single Event Noise Exposure Level). The summation of Le values averaged over one hour is Leq(1), over eight hours is Leq(8), over 24 hours is Leq(24), etc.

Leq is further refined into Ldn (Level Day-Night) and CNEL (Community Noise Equivalent Level), where noise that occurs during certain hours of the day are weighted (or penalized) in an attempt to compensate for the general perception that such noise is more annoying during these time periods (typically evening and nighttime hours).

(1) Ldn is the sound level in dBA that corresponds to the average energy content of the noise being measured over a 24-hour period but includes a ten (10) dBA weighting penalty for noise that occurs during the nighttime hours between 10:00 PM and 7:00 AM. The Ldn is a noise rating method recommended by the Environmental Protection Agency because it takes into account those subjectively more annoying noise events that occur during normal sleeping hours.

(2) CNEL is the sound level in dBA that corresponds to the average energy content of the noise being measured over a 24-hour period but includes a five (5) dBA penalty for noise that occurs during the evening hours between 7:00 PM and 10:00 PM, and a ten (10) dBA penalty for noise that occurs during the nighttime hours between 10:00 PM and 7:00 AM. For typical highway vehicular traffic situations, computer analysis has shown that the Ldn and CNEL values correlate within 0.5 dBA.

The percentile figures L_{10}, L_{50} and L_{90} can be directly scaled from a graphical recording of the measured noise sample over a particular time period. These figures can also be measured directly using modern automatic noise measuring equipment. Measurement of the parameters Le, Leq, Ldn and CNEL requires even more sophisticated and correspondingly expensive noise measuring equipment. As a result, engineers have devised ways of estimating Leq (and hence, Ldn) using standard instrumentation and methods.

CHRISTOPHER JEAN & ASSOCIATES, INC.
ACOUSTICAL CONSULTING SERVICES

APPENDIX 2

EXISTING TRAFFIC NOISE CALCULATIONS

P. O. BOX 2325 • FULLERTON, CALIFORNIA • 92837
PHONE: 714-805-0115

HOURLY NOISE LEVEL

PROJECT : SPRINGHILL & RESIDENCE INN
STREET NAME : CONT
SITE TYPE : HARD

INPUT DATA

	AUTO	METK	HVTK
SPEED:	65	65	65
% VOLUME:	88.5	2.9	8.600001

VOLUME = 9252
HVY TRK GRADIENT = 0 DBA

NOISE LEVEL

AUTO	81.3
MED.TRK.	76.0
HVY.TRK.	83.9
TOTAL	86.2

NOISE LEVEL AT 150 FT

AUTO	MEDIUM TRK	HEAVY TRK	TOTAL
76.5	71.2	79.1	81.5

LEQ AT SPECIFIED DISTANCES

DISTANCE	LEQ
50	86.2
75	84.5
100	83.2
125	82.3
150	81.5
175	80.8
200	80.2
250	79.3
300	78.5
350	77.8
400	77.2
450	76.7
500	76.2
550	75.8
600	75.5
650	75.1
700	74.8
750	74.5
800	74.2
1000	73.2

CHRISTOPHER JEAN & ASSOCIATES, INC.
ACOUSTICAL CONSULTING SERVICES

APPENDIX 3

FUTURE TRAFFIC NOISE CALCULATIONS

P. O. BOX 2325 • FULLERTON, CALIFORNIA • 92837
PHONE: 714-805-0115

FHWA RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT NAME	:SPRINGHILL & RESIDENCE INN
SITE LOCATION	:SANTA CLARITA
DESCRIPTION	:INTERSTATE 5
SITE TYPE	:HARD

INPUT DATA	AUTO	MEDIUM TRUCK	HEAVY TRUCK
SPEED	65	65	65
% DAY	73	73	69.1
% EVENING	8.60	8.60	6.70
% NIGHT	18.4	18.4	24.2
% VOLUME	87.4	2.8	9.8
VOLUME	188000		

----AVERAGE HOURLY NOISE LEVELS AT 50 FEET----

	DAY	EVENING	NIGHT	24 HOUR	CNEL
AUTO	82.17	78.91	77.44	80.53	85.05
MEDIUM TRK.	76.79	73.52	72.05	75.14	79.66
HEAVY TRK.	85.16	81.05	81.86	83.76	88.96
TOTAL	87.33	83.57	83.52	85.84	90.79

NOISE LEVEL AT SPECIFIED DISTANCES

DISTANCE	CNEL
50	90.79
75	89.03
100	87.78
125	86.81
150	86.02
175	85.35
200	84.77
225	84.26
250	83.80
275	83.38
300	83.01
325	82.66
350	82.34
375	82.04
400	81.76
450	81.25
500	80.79
550	80.37
600	80.00
650	79.65
700	79.33
750	79.03
800	78.75

CHRISTOPHER JEAN & ASSOCIATES, INC.
ACOUSTICAL CONSULTING SERVICES

APPENDIX 4

SOUND BARRIER HEIGHT CALCULATIONS

P. O. BOX 2325 • FULLERTON, CALIFORNIA • 92837
PHONE: 714-805-0115

BARRIER NOISE REDUCTION ANALYSIS,WALL HEIGHT VARIABLE

REFERENCE VEHICLE LEVELS AT 50 FEET

AUTO.........= 82.05
M.TRUCK......= 76.66001
H.TRUCK......= 85.96

PROJECT......RESIDENCE INN
DESCRIPTION..POOL AREA NOISE BARRIER
SOURCE ELEVATION....... 0
RECEIVER ELEVATION..... 8
BARRIER ELEVATION...... 8
RECEIVER HEIGHT........ 5
DISTANCE TO SOURCE..... 175
DISTANCE TO RECEIVER... 20
AUTO NOISE LEVEL...... 76.13936
M.TRK NOISE LEVEL...... 70.74936
H.TRK NOISE LEVEL...... 80.04936
SOURCE NOISE LEVEL..... 71.09

ANGULAR CORRECTION(DB) - 10.79181

WALL HEIGHT	ANL	MTNL	HTNL	TNL	TIL
0.00	65.35	59.96	69.26	71.09	0.00
FN	0.0000	0.0000	0.0000		
1.00	65.35	59.96	69.26	71.09	0.00
FN	0.0000	0.0000	0.0000		
2.00	65.35	59.96	69.26	71.09	0.00
FN	0.0000	0.0000	0.0000		
3.00	65.35	59.96	69.26	71.09	0.00
FN	0.0000	0.0000	0.0000		
4.00	60.31	54.95	69.26	69.92	1.17
FN	0.0028	0.0004	0.0000		
5.00	59.80	54.56	64.17	65.86	5.23
FN	0.0483	0.0351	0.0072		
6.00	59.05	53.77	63.55	65.20	5.89
FN	0.1494	0.1254	0.0634		
7.00	58.24	53.03	62.84	64.46	6.63
FN	0.3059	0.2712	0.1750		
8.00	57.22	52.03	61.97	63.54	7.55
FN	0.5174	0.4719	0.3416		

BARRIER NOISE REDUCTION ANALYSIS,WALL HEIGHT VARIABLE

REFERENCE VEHICLE LEVELS AT 50 FEET

AUTO.........= 82.05
M.TRUCK......= 76.66001
H.TRUCK......= 85.96

PROJECT......HOLIDAY INN
DESCRIPTION..POOL AREA SOUND BARRIER
SOURCE ELEVATION....... 0
RECEIVER ELEVATION..... 2
BARRIER ELEVATION...... 2
RECEIVER HEIGHT........ 5
DISTANCE TO SOURCE..... 175
DISTANCE TO RECEIVER... 20
AUTO NOISE LEVEL...... 76.13936
M.TRK NOISE LEVEL...... 70.74936
H.TRK NOISE LEVEL...... 80.04936
SOURCE NOISE LEVEL..... 74.10

ANGULAR CORRECTION(DB) - 7.781512

WALL HEIGHT	ANL	MTNL	HTNL	TNL	TIL
0.00	68.36	62.97	72.27	74.10	0.00
FN	0.0000	0.0000	0.0000		
1.00	68.36	62.97	72.27	74.10	0.00
FN	0.0000	0.0000	0.0000		
2.00	68.36	62.97	72.27	74.10	0.00
FN	0.0000	0.0000	0.0000		
3.00	68.36	62.97	72.27	74.10	0.00
FN	0.0000	0.0000	0.0000		
4.00	68.36	62.97	72.27	74.10	0.00
FN	0.0000	0.0000	0.0000		
5.00	63.20	57.88	72.27	72.91	1.18
FN	0.0138	0.0072	0.0000		
6.00	62.47	57.26	67.01	68.65	5.45
FN	0.0808	0.0634	0.0222		
7.00	61.79	56.55	66.19	67.87	6.23
FN	0.2033	0.1750	0.0996		
8.00	60.87	55.68	65.55	67.14	6.95
FN	0.3807	0.3416	0.2319		
9.00	59.82	54.64	64.60	66.16	7.94
FN	0.6121	0.5622	0.4183		
10.00	58.77	53.58	63.55	65.11	8.99
FN	0.8963	0.8357	0.6576		

CHRISTOPHER JEAN & ASSOCIATES, INC.
ACOUSTICAL CONSULTING SERVICES

APPENDIX 5

INTERIOR NOISE REDUCTION CALCULATIONS

P. O. BOX 2325 • FULLERTON, CALIFORNIA • 92837
PHONE: 714-805-0115

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN STUDIO/1 BR + STC = 24

FLOOR AREA 261

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		171	0.01710
EXT.WALL 2	43		45	0.00226
EXT.WALL 3	50		0	0.00000
INT.WALL			450	
WINDOW 1	22	.05	35	0.22084
WINDOW 2	25	.05	0	0.00000
WINDOW 3	32	.05	0	0.00000
SGD	22	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	261	0.02610
FLOOR		.6	261	
ET*S				0.26629
-10LOG(ET*S)				5.7
10LOGA				22.9
NOISE REDUCTION				22.6

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN STUDIO/1 BR + STC = 26

FLOOR AREA 261

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		171	0.01710
EXT.WALL 2	43		45	0.00226
EXT.WALL 3	50		0	0.00000
INT.WALL			450	
WINDOW 1	24	.05	35	0.13934
WINDOW 2	27	.05	0	0.00000
WINDOW 3	34	.05	0	0.00000
SGD	24	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	261	0.02610
FLOOR		.6	261	
ET*S				0.18479
-10LOG(ET*S)				7.3
10LOGA				22.9
NOISE REDUCTION				24.2

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN STUDIO/1 BR + STC = 28

FLOOR AREA 261

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		171	0.01710
EXT.WALL 2	43		45	0.00226
EXT.WALL 3	50		0	0.00000
INT.WALL			450	
WINDOW 1	26	.05	35	0.08792
WINDOW 2	29	.05	0	0.00000
WINDOW 3	36	.05	0	0.00000
SGD	26	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	261	0.02610
FLOOR		.6	261	
ET*S				0.13337
-10LOG(ET*S)				8.7
10LOGA				22.9
NOISE REDUCTION				25.6

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN STUDIO/1 BR + STC = 30

FLOOR AREA 261

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		171	0.01710
EXT.WALL 2	43		45	0.00226
EXT.WALL 3	50		0	0.00000
INT.WALL			450	
WINDOW 1	28	.05	35	0.05547
WINDOW 2	31	.05	0	0.00000
WINDOW 3	38	.05	0	0.00000
SGD	28	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	261	0.02610
FLOOR		.6	261	
ET*S				0.10093
-10LOG(ET*S)				10.0
10LOGA				22.9
NOISE REDUCTION				26.9

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN STUDIO/1 BR + STC = 32

FLOOR AREA 261

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		171	0.01710
EXT.WALL 2	43		45	0.00226
EXT.WALL 3	50		0	0.00000
INT.WALL			450	
WINDOW 1	30	.05	35	0.03500
WINDOW 2	33	.05	0	0.00000
WINDOW 3	40	.05	0	0.00000
SGD	30	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	261	0.02610
FLOOR		.6	261	
ET*S				0.08046
-10LOG(ET*S)				10.9
10LOGA				22.9
NOISE REDUCTION				27.8

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN STUDIO/1 BR + STC = 34

FLOOR AREA 261

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		171	0.01710
EXT.WALL 2	43		45	0.00226
EXT.WALL 3	50		0	0.00000
INT.WALL			450	
WINDOW 1	32	.05	35	0.02208
WINDOW 2	35	.05	0	0.00000
WINDOW 3	42	.05	0	0.00000
SGD	32	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	261	0.02610
FLOOR		.6	261	
ET*S				0.06754
-10LOG(ET*S)				11.7
10LOGA				22.9
NOISE REDUCTION				28.6

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN STUDIO/1 BR + STC = 36

FLOOR AREA 261

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		171	0.01710
EXT.WALL 2	43		45	0.00226
EXT.WALL 3	50		0	0.00000
INT.WALL			450	
WINDOW 1	34	.05	35	0.01393
WINDOW 2	37	.05	0	0.00000
WINDOW 3	44	.05	0	0.00000
SGD	34	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	261	0.02610
FLOOR		.6	261	
ET*S				0.05939
-10LOG(ET*S)				12.3
10LOGA				22.9
NOISE REDUCTION				29.2

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN STUDIO/1 BR + STC = 38

FLOOR AREA 261

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		171	0.01710
EXT.WALL 2	43		45	0.00226
EXT.WALL 3	50		0	0.00000
INT.WALL			450	
WINDOW 1	36	.05	35	0.00879
WINDOW 2	39	.05	0	0.00000
WINDOW 3	46	.05	0	0.00000
SGD	36	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	261	0.02610
FLOOR		.6	261	
ET*S				0.05425
-10LOG(ET*S)				12.7
10LOGA				22.9
NOISE REDUCTION				29.5

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME   RES INN STUDIO/1 BR + STC = 40

FLOOR AREA   261

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		171	0.01710
EXT.WALL 2	43		45	0.00226
EXT.WALL 3	50		0	0.00000
INT.WALL			450	
WINDOW 1	38	.05	35	0.00555
WINDOW 2	41	.05	0	0.00000
WINDOW 3	48	.05	0	0.00000
SGD	38	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	261	0.02610
FLOOR		.6	261	
ET*S				0.05100
-10LOG(ET*S)				12.9
10LOGA				22.9
NOISE REDUCTION				29.8

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN DBL QUEEN + STC = 24

FLOOR AREA 297

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		268	0.02680
EXT.WALL 2	43		73	0.00366
EXT.WALL 3	50		0	0.00000
INT.WALL			351	
WINDOW 1	22	.05	0	0.00000
WINDOW 2	25	.05	25	0.07906
WINDOW 3	32	.05	0	0.00000
SGD	22	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	297	0.02970
FLOOR		.6	297	
ET*S				0.13922
-10LOG(ET*S)				8.6
10LOGA				23.3
NOISE REDUCTION				25.9

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN DBL QUEEN + STC = 26

FLOOR AREA 297

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		268	0.02680
EXT.WALL 2	43		73	0.00366
EXT.WALL 3	50		0	0.00000
INT.WALL			351	
WINDOW 1	24	.05	0	0.00000
WINDOW 2	27	.05	25	0.04988
WINDOW 3	34	.05	0	0.00000
SGD	24	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	297	0.02970
FLOOR		.6	297	
ET*S				0.11004
-10LOG(ET*S)				9.6
10LOGA				23.3
NOISE REDUCTION				26.9

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN DBL QUEEN + STC = 28

FLOOR AREA 297

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		268	0.02680
EXT.WALL 2	43		73	0.00366
EXT.WALL 3	50		0	0.00000
INT.WALL			351	
WINDOW 1	26	.05	0	0.00000
WINDOW 2	29	.05	25	0.03147
WINDOW 3	36	.05	0	0.00000
SGD	26	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	297	0.02970
FLOOR		.6	297	
ET*S				0.09163
-10LOG(ET*S)				10.4
10LOGA				23.3
NOISE REDUCTION				27.7

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN DBL QUEEN + STC = 30

FLOOR AREA 297

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		268	0.02680
EXT.WALL 2	43		73	0.00366
EXT.WALL 3	50		0	0.00000
INT.WALL			351	
WINDOW 1	28	.05	0	0.00000
WINDOW 2	31	.05	25	0.01986
WINDOW 3	38	.05	0	0.00000
SGD	28	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	297	0.02970
FLOOR		.6	297	
ET*S				0.08002
-10LOG(ET*S)				11.0
10LOGA				23.3
NOISE REDUCTION				28.3

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN DBL QUEEN + STC = 32

FLOOR AREA 297

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		268	0.02680
EXT.WALL 2	43		73	0.00366
EXT.WALL 3	50		0	0.00000
INT.WALL			351	
WINDOW 1	30	.05	0	0.00000
WINDOW 2	33	.05	25	0.01253
WINDOW 3	40	.05	0	0.00000
SGD	30	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	297	0.02970
FLOOR		.6	297	
ET*S				0.07269
-10LOG(ET*S)				11.4
10LOGA				23.3
NOISE REDUCTION				28.7

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN DBL QUEEN + STC = 34

FLOOR AREA 297

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		268	0.02680
EXT.WALL 2	43		73	0.00366
EXT.WALL 3	50		0	0.00000
INT.WALL			351	
WINDOW 1	32	.05	0	0.00000
WINDOW 2	35	.05	25	0.00791
WINDOW 3	42	.05	0	0.00000
SGD	32	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	297	0.02970
FLOOR		.6	297	
ET*S				0.06806
-10LOG(ET*S)				11.7
10LOGA				23.3
NOISE REDUCTION				29.0

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN DBL QUEEN + STC = 36

FLOOR AREA 297

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		268	0.02680
EXT.WALL 2	43		73	0.00366
EXT.WALL 3	50		0	0.00000
INT.WALL			351	
WINDOW 1	34	.05	0	0.00000
WINDOW 2	37	.05	25	0.00499
WINDOW 3	44	.05	0	0.00000
SGD	34	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	297	0.02970
FLOOR		.6	297	
ET*S				0.06515
-10LOG(ET*S)				11.9
10LOGA				23.3
NOISE REDUCTION				29.2

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN DBL QUEEN + STC = 38

FLOOR AREA 297

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		268	0.02680
EXT.WALL 2	43		73	0.00366
EXT.WALL 3	50		0	0.00000
INT.WALL			351	
WINDOW 1	36	.05	0	0.00000
WINDOW 2	39	.05	25	0.00315
WINDOW 3	46	.05	0	0.00000
SGD	36	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	297	0.02970
FLOOR		.6	297	
ET*S				0.06331
-10LOG(ET*S)				12.0
10LOGA				23.3
NOISE REDUCTION				29.3

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN DBL QUEEN + STC = 40

FLOOR AREA 297

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		268	0.02680
EXT.WALL 2	43		73	0.00366
EXT.WALL 3	50		0	0.00000
INT.WALL			351	
WINDOW 1	38	.05	0	0.00000
WINDOW 2	41	.05	25	0.00199
WINDOW 3	48	.05	0	0.00000
SGD	38	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	297	0.02970
FLOOR		.6	297	
ET*S				0.06214
-10LOG(ET*S)				12.1
10LOGA				23.3
NOISE REDUCTION				29.4

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN KING + STC = 24

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		0	0.00000
EXT.WALL 2	43		38	0.00190
EXT.WALL 3	50		0	0.00000
INT.WALL			549	
WINDOW 1	22	.05	0	0.00000
WINDOW 2	25	.05	25	0.07906
WINDOW 3	32	.05	0	0.00000
SGD	22	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	249	0.02490
FLOOR		.6	249	
ET*S				0.10586
-10LOG(ET*S)				9.8
10LOGA				22.6
NOISE REDUCTION				26.4

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN KING + STC = 26

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		0	0.00000
EXT.WALL 2	43		38	0.00190
EXT.WALL 3	50		0	0.00000
INT.WALL			549	
WINDOW 1	24	.05	0	0.00000
WINDOW 2	27	.05	25	0.04988
WINDOW 3	34	.05	0	0.00000
SGD	24	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	249	0.02490
FLOOR		.6	249	
ET*S				0.07669
-10LOG(ET*S)				11.2
10LOGA				22.6
NOISE REDUCTION				27.8

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN KING + STC = 28

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		0	0.00000
EXT.WALL 2	43		38	0.00190
EXT.WALL 3	50		0	0.00000
INT.WALL			549	
WINDOW 1	26	.05	0	0.00000
WINDOW 2	29	.05	25	0.03147
WINDOW 3	36	.05	0	0.00000
SGD	26	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	249	0.02490
FLOOR		.6	249	
ET*S				0.05828
-10LOG(ET*S)				12.3
10LOGA				22.6
NOISE REDUCTION				29.0

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN KING + STC = 30

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		0	0.00000
EXT.WALL 2	43		38	0.00190
EXT.WALL 3	50		0	0.00000
INT.WALL			549	
WINDOW 1	28	.05	0	0.00000
WINDOW 2	31	.05	25	0.01986
WINDOW 3	38	.05	0	0.00000
SGD	28	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	249	0.02490
FLOOR		.6	249	
ET*S				0.04666
-10LOG(ET*S)				13.3
10LOGA				22.6
NOISE REDUCTION				29.9

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN KING + STC = 32

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		0	0.00000
EXT.WALL 2	43		38	0.00190
EXT.WALL 3	50		0	0.00000
INT.WALL			549	
WINDOW 1	30	.05	0	0.00000
WINDOW 2	33	.05	25	0.01253
WINDOW 3	40	.05	0	0.00000
SGD	30	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	249	0.02490
FLOOR		.6	249	
ET*S				0.03933
-10LOG(ET*S)				14.1
10LOGA				22.6
NOISE REDUCTION				30.7

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN KING + STC = 34

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		0	0.00000
EXT.WALL 2	43		38	0.00190
EXT.WALL 3	50		0	0.00000
INT,WALL			549	
WINDOW 1	32	.05	0	0.00000
WINDOW 2	35	.05	25	0.00791
WINDOW 3	42	.05	0	0.00000
SGD	32	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	249	0.02490
FLOOR		.6	249	
ET*S				0.03471
-10LOG(ET*S)				14.6
10LOGA				22.6
NOISE REDUCTION				31.2

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME   RES INN KING + STC = 36

FLOOR AREA   249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		0	0.00000
EXT.WALL 2	43		38	0.00190
EXT.WALL 3	50		0	0.00000
INT.WALL			549	
WINDOW 1	34	.05	0	0.00000
WINDOW 2	37	.05	25	0.00499
WINDOW 3	44	.05	0	0.00000
SGD	34	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	249	0.02490
FLOOR		.6	249	
ET*S				0.03179
-10LOG(ET*S)				15.0
10LOGA				22.6
NOISE REDUCTION				31.6

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME   RES INN KING + STC = 38

FLOOR AREA   249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		0	0.00000
EXT.WALL 2	43		38	0.00190
EXT.WALL 3	50		0	0.00000
INT.WALL			549	
WINDOW 1	36	.05	0	0.00000
WINDOW 2	39	.05	25	0.00315
WINDOW 3	46	.05	0	0.00000
SGD	36	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	249	0.02490
FLOOR		.6	249	
ET*S				0.02995
-10LOG(ET*S)				15.2
10LOGA				22.6
NOISE REDUCTION				31.8

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN KING + STC = 40

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		0	0.00000
EXT.WALL 2	43		38	0.00190
EXT.WALL 3	50		0	0.00000
INT.WALL			549	
WINDOW 1	38	.05	0	0.00000
WINDOW 2	41	.05	25	0.00199
WINDOW 3	48	.05	0	0.00000
SGD	38	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	249	0.02490
FLOOR		.6	249	
ET*S				0.02879
-10LOG(ET*S)				15.4
10LOGA				22.6
NOISE REDUCTION				32.0

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HLOIDAY KING + STC = 24

FLOOR AREA 239

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		171	0.01710
EXT.WALL 2	43		99	0.00496
EXT.WALL 3	50		0	0.00000
INT.WALL			282	
WINDOW 1	22	.05	0	0.00000
WINDOW 2	25	.05	25	0.07906
WINDOW 3	32	.05	0	0.00000
SGD	22	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	239	0.02390
FLOOR		.6	239	
ET*S				0.12502
-10LOG(ET*S)				9.0
10LOGA				22.4
NOISE REDUCTION				25.4

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HLOTDAY KING + STC = 26

FLOOR AREA 239

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		171	0.01710
EXT.WALL 2	43		99	0.00496
EXT.WALL 3	50		0	0.00000
INT.WALL			282	
WINDOW 1	24	.05	0	0.00000
WINDOW 2	27	.05	25	0.04988
WINDOW 3	34	.05	0	0.00000
SGD	24	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	239	0.02390
FLOOR		.6	239	
ET*S				0.09584
-10LOG(ET*S)				10.2
10LOGA				22.4
NOISE REDUCTION				26.5

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HLOIDAY KING + STC = 28

FLOOR AREA 239

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		171	0.01710
EXT.WALL 2	43		99	0.00496
EXT.WALL 3	50		0	0.00000
INT.WALL			282	
WINDOW 1	26	.05	0	0.00000
WINDOW 2	29	.05	25	0.03147
WINDOW 3	36	.05	0	0.00000
SGD	26	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	239	0.02390
FLOOR		.6	239	
ET*S				0.07743
-10LOG(ET*S)				11.1
10LOGA				22.4
NOISE REDUCTION				27.5

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HLOIDAY KING + STC = 30

FLOOR AREA 239

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		171	0.01710
EXT.WALL 2	43		99	0.00496
EXT.WALL 3	50		0	0.00000
INT.WALL			282	
WINDOW 1	28	.05	0	0.00000
WINDOW 2	31	.05	25	0.01986
WINDOW 3	38	.05	0	0.00000
SGD	28	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	239	0.02390
FLOOR		.6	239	
ET*S				0.06582
-10LOG(ET*S)				11.8
10LOGA				22.4
NOISE REDUCTION				28.2

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HLOIDAY KING + STC = 32

FLOOR AREA 239

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		171	0.01710
EXT.WALL 2	43		99	0.00496
EXT.WALL 3	50		0	0.00000
INT.WALL			282	
WINDOW 1	30	.05	0	0.00000
WINDOW 2	33	.05	25	0.01253
WINDOW 3	40	.05	0	0.00000
SGD	30	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	239	0.02390
FLOOR		.6	239	
ET*S				0.05849
-10LOG(ET*S)				12.3
10LOGA				22.4
NOISE REDUCTION				28.7

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HLOIDAY KING + STC = 34

FLOOR AREA 239

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		171	0.01710
EXT.WALL 2	43		99	0.00496
EXT.WALL 3	50		0	0.00000
INT.WALL			282	
WINDOW 1	32	.05	0	0.00000
WINDOW 2	35	.05	25	0.00791
WINDOW 3	42	.05	0	0.00000
SGD	32	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	239	0.02390
FLOOR		.6	239	
ET*S				0.05387
-10LOG(ET*S)				12.7
10LOGA				22.4
NOISE REDUCTION				29.0

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HLOIDAY KING + STC = 36

FLOOR AREA 239

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		171	0.01710
EXT.WALL 2	43		99	0.00496
EXT.WALL 3	50		0	0.00000
INT.WALL			282	
WINDOW 1	34	.05	0	0.00000
WINDOW 2	37	.05	25	0.00499
WINDOW 3	44	.05	0	0.00000
SGD	34	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	239	0.02390
FLOOR		.6	239	
ET*S				0.05095
-10LOG(ET*S)				12.9
10LOGA				22.4
NOISE REDUCTION				29.3

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HLOIDAY KING + STC = 38

FLOOR AREA 239

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		171	0.01710
EXT.WALL 2	43		99	0.00496
EXT.WALL 3	50		0	0.00000
INT.WALL			282	
WINDOW 1	36	.05	0	0.00000
WINDOW 2	39	.05	25	0.00315
WINDOW 3	46	.05	0	0.00000
SGD	36	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	239	0.02390
FLOOR		.6	239	
ET*S				0.04911
-10LOG(ET*S)				13.1
10LOGA				22.4
NOISE REDUCTION				29.4

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME : HOLIDAY KING + STC = 40

FLOOR AREA : 239

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		171	0.01710
EXT.WALL 2	43		99	0.00496
EXT.WALL 3	50		0	0.00000
INT.WALL			282	
WINDOW 1	38	.05	0	0.00000
WINDOW 2	41	.05	25	0.00199
WINDOW 3	48	.05	0	0.00000
SGD	38	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	239	0.02390
FLOOR		.6	239	
ET*S				0.04795
-10LOG(ET*S)				13.2
10LOGA				22.4
NOISE REDUCTION				29.5

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY DBL QUEEN + STC = 24

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		99	0.00990
EXT.WALL 2	43		0	0.00000
EXT.WALL 3	50		0	0.00000
INT.WALL			456	
WINDOW 1	22	.05	25	0.15774
WINDOW 2	25	.05	0	0.00000
WINDOW 3	32	.05	0	0.00000
SGD	22	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	249	0.02490
FLOOR		.6	249	
ET*S				0.19254
-10LOG(ET*S)				7.2
10LOGA				22.6
NOISE REDUCTION				23.8

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY DBL QUEEN + STC = 26

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		99	0.00990
EXT.WALL 2	43		0	0.00000
EXT.WALL 3	50		0	0.00000
INT.WALL			456	
WINDOW 1	24	.05	25	0.09953
WINDOW 2	27	.05	0	0.00000
WINDOW 3	34	.05	0	0.00000
SGD	24	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	249	0.02490
FLOOR		.6	249	
ET*S				0.13433
-10LOG(ET*S)				8.7
10LOGA				22.6
NOISE REDUCTION				25.4

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY DBL QUEEN + STC = 28

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		99	0.00990
EXT.WALL 2	43		0	0.00000
EXT.WALL 3	50		0	0.00000
INT.WALL			456	
WINDOW 1	26	.05	25	0.06280
WINDOW 2	29	.05	0	0.00000
WINDOW 3	36	.05	0	0.00000
SGD	26	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	249	0.02490
FLOOR		.6	249	
ET*S				0.09760
-10LOG(ET*S)				10.1
10LOGA				22.6
NOISE REDUCTION				26.7

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY DBL QUEEN + STC = 30

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		99	0.00990
EXT.WALL 2	43		0	0.00000
EXT.WALL 3	50		0	0.00000
INT.WALL			456	
WINDOW 1	28	.05	25	0.03962
WINDOW 2	31	.05	0	0.00000
WINDOW 3	38	.05	0	0.00000
SGD	28	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	249	0.02490
FLOOR		.6	249	
ET*S				0.07442
-10LOG(ET*S)				11.3
10LOGA				22.6
NOISE REDUCTION				27.9

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY DBL QUEEN + STC = 32

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		99	0.00990
EXT.WALL 2	43		0	0.00000
EXT.WALL 3	50		0	0.00000
INT.WALL			456	
WINDOW 1	30	.05	25	0.02500
WINDOW 2	33	.05	0	0.00000
WINDOW 3	40	.05	0	0.00000
SGD	30	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	249	0.02490
FLOOR		.6	249	
ET*S				0.05980
-10LOG(ET*S)				12.2
10LOGA				22.6
NOISE REDUCTION				28.9

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY DBL QUEEN + STC = 34

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		99	0.00990
EXT.WALL 2	43		0	0.00000
EXT.WALL 3	50		0	0.00000
INT.WALL			456	
WINDOW 1	32	.05	25	0.01577
WINDOW 2	35	.05	0	0.00000
WINDOW 3	42	.05	0	0.00000
SGD	32	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	249	0.02490
FLOOR		.6	249	
ET*S				0.05057
-10LOG(ET*S)				13.0
10LOGA				22.6
NOISE REDUCTION				29.6

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY DBL QUEEN + STC = 36

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		99	0.00990
EXT.WALL 2	43		0	0.00000
EXT.WALL 3	50		0	0.00000
INT.WALL			456	
WINDOW 1	34	.05	25	0.00995
WINDOW 2	37	.05	0	0.00000
WINDOW 3	44	.05	0	0.00000
SGD	34	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	249	0.02490
FLOOR		.6	249	
ET*S				0.04475
-10LOG(ET*S)				13.5
10LOGA				22.6
NOISE REDUCTION				30.1

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY DBL QUEEN + STC = 38

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		99	0.00990
EXT.WALL 2	43		0	0.00000
EXT.WALL 3	50		0	0.00000
INT.WALL			456	
WINDOW 1	36	.05	25	0.00628
WINDOW 2	39	.05	0	0.00000
WINDOW 3	46	.05	0	0.00000
SGD	36	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	249	0.02490
FLOOR		.6	249	
ET*S				0.04108
-10LOG(ET*S)				13.9
10LOGA				22.6
NOISE REDUCTION				30.5

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY DBL QUEEN + STC = 40

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		99	0.00990
EXT.WALL 2	43		0	0.00000
EXT.WALL 3	50		0	0.00000
INT.WALL			456	
WINDOW 1	38	.05	25	0.00396
WINDOW 2	41	.05	0	0.00000
WINDOW 3	48	.05	0	0.00000
SGD	38	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	249	0.02490
FLOOR		.6	249	
ET*S				0.03876
-10LOG(ET*S)				14.1
10LOGA				22.6
NOISE REDUCTION				30.8

CHRISTOPHER JEAN & ASSOCIATES, INC.
ACOUSTICAL CONSULTING SERVICES

APPENDIX 6

INTERIOR NOISE REDUCTION CALCULATIONS WITH EXTERIOR WALL AND ROOF/CEILING UPGRADES

P. O. BOX 2325 • FULLERTON, CALIFORNIA • 92837
PHONE: 714-805-0115

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN STUDIO/1 BR + UPGRADES + STC = 24

FLOOR AREA 261

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		171	0.00171
EXT.WALL 2	53		45	0.00023
EXT.WALL 3	60		0	0.00000
INT.WALL			450	
WINDOW 1	22	.05	35	0.22084
WINDOW 2	25	.05	0	0.00000
WINDOW 3	32	.05	0	0.00000
SGD	22	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	261	0.00261
FLOOR		.6	261	
ET*S				0.22538
-10LOG(ET*S)				6.5
10LOGA				22.9
NOISE REDUCTION				23.4

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN STUDIO/1 BR + UPGRADES + STC = 26

FLOOR AREA 261

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		171	0.00171
EXT.WALL 2	53		45	0.00023
EXT.WALL 3	60		0	0.00000
INT.WALL			450	
WINDOW 1	24	.05	35	0.13934
WINDOW 2	27	.05	0	0.00000
WINDOW 3	34	.05	0	0.00000
SGD	24	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	261	0.00261
FLOOR		.6	261	
ET*S				0.14388
-10LOG(ET*S)				8.4
10LOGA				22.9
NOISE REDUCTION				25.3

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN STUDIO/1 BR + UPGRADES + STC = 28

FLOOR AREA 261

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		171	0.00171
EXT.WALL 2	53		45	0.00023
EXT.WALL 3	60		0	0.00000
INT.WALL			450	
WINDOW 1	26	.05	35	0.08792
WINDOW 2	29	.05	0	0.00000
WINDOW 3	36	.05	0	0.00000
SGD	26	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	261	0.00261
FLOOR		.6	261	
ET*S				0.09246
-10LOG(ET*S)				10.3
10LOGA				22.9
NOISE REDUCTION				27.2

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN STUDIO/1 BR + UPGRADES + STC = 30

FLOOR AREA 261

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		171	0.00171
EXT.WALL 2	53		45	0.00023
EXT.WALL 3	60		0	0.00000
INT.WALL			450	
WINDOW 1	28	.05	35	0.05547
WINDOW 2	31	.05	0	0.00000
WINDOW 3	38	.05	0	0.00000
SGD	28	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	261	0.00261
FLOOR		.6	261	
ET*S				0.06002
-10LOG(ET*S)				12.2
10LOGA				22.9
NOISE REDUCTION				29.1

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN STUDIO/1 BR + UPGRADES + STC = 32

FLOOR AREA 261

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		171	0.00171
EXT.WALL 2	53		45	0.00023
EXT.WALL 3	60		0	0.00000
INT.WALL			450	
WINDOW 1	30	.05	35	0.03500
WINDOW 2	33	.05	0	0.00000
WINDOW 3	40	.05	0	0.00000
SGD	30	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	261	0.00261
FLOOR		.6	261	
ET*S				0.03955
-10LOG(ET*S)				14.0
10LOGA				22.9
NOISE REDUCTION				30.9

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN STUDIO/1 BR + UPGRADES + STC = 34

FLOOR AREA 261

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		171	0.00171
EXT.WALL 2	53		45	0.00023
EXT.WALL 3	60		0	0.00000
INT.WALL			450	
WINDOW 1	32	.05	35	0.02208
WINDOW 2	35	.05	0	0.00000
WINDOW 3	42	.05	0	0.00000
SGD	32	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	261	0.00261
FLOOR		.6	261	
ET*S				0.02663
-10LOG(ET*S)				15.7
10LOGA				22.9
NOISE REDUCTION				32.6

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN STUDIO/1 BR + UPGRADES + STC = 36

FLOOR AREA 261

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		171	0.00171
EXT.WALL 2	53		45	0.00023
EXT.WALL 3	60		0	0.00000
INT.WALL			450	
WINDOW 1	34	.05	35	0.01393
WINDOW 2	37	.05	0	0.00000
WINDOW 3	44	.05	0	0.00000
SGD	34	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	261	0.00261
FLOOR		.6	261	
ET*S				0.01848
-10LOG(ET*S)				17.3
10LOGA				22.9
NOISE REDUCTION				34.2

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN STUDIO/1 BR + UPGRADES + STC = 38

FLOOR AREA 261

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		171	0.00171
EXT.WALL 2	53		45	0.00023
EXT.WALL 3	60		0	0.00000
INT.WALL			450	
WINDOW 1	36	.05	35	0.00879
WINDOW 2	39	.05	0	0.00000
WINDOW 3	46	.05	0	0.00000
SGD	36	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	261	0.00261
FLOOR		.6	261	
ET*S				0.01334
-10LOG(ET*S)				18.7
10LOGA				22.9
NOISE REDUCTION				35.6

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME : RES INN STUDIO/1 BR + UPGRADES + STC = 40

FLOOR AREA 261

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		171	0.00171
EXT.WALL 2	53		45	0.00023
EXT.WALL 3	60		0	0.00000
INT.WALL			450	
WINDOW 1	38	.05	35	0.00555
WINDOW 2	41	.05	0	0.00000
WINDOW 3	48	.05	0	0.00000
SGD	38	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	261	0.00261
FLOOR		.6	261	
ET*S				0.01009
-10LOG(ET*S)				20.0
10LOGA				22.9
NOISE REDUCTION				36.9

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN DBL QUEEN + UPGRADES + STC = 24

FLOOR AREA 297

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		268	0.00268
EXT.WALL 2	53		73	0.00037
EXT.WALL 3	60		0	0.00000
INT.WALL			351	
WINDOW 1	22	.05	0	0.00000
WINDOW 2	25	.05	25	0.07906
WINDOW 3	32	.05	0	0.00000
SGD	22	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	297	0.00297
FLOOR		.6	297	
ET*S				0.08507
-10LOG(ET*S)				10.7
10LOGA				23.3
NOISE REDUCTION				28.0

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN DBL QUEEN + UPGRADES + STC = 26

FLOOR AREA 297

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		268	0.00268
EXT.WALL 2	53		73	0.00037
EXT.WALL 3	60		0	0.00000
INT.WALL			351	
WINDOW 1	24	.05	0	0.00000
WINDOW 2	27	.05	25	0.04988
WINDOW 3	34	.05	0	0.00000
SGD	24	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	297	0.00297
FLOOR		.6	297	
ET*S				0.05590
-10LOG(ET*S)				12.5
10LOGA				23.3
NOISE REDUCTION				29.9

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN DBL QUEEN + UPGRADES + STC = 28

FLOOR AREA 297

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		268	0.00268
EXT.WALL 2	53		73	0.00037
EXT.WALL 3	60		0	0.00000
INT.WALL			351	
WINDOW 1	26	.05	0	0.00000
WINDOW 2	29	.05	25	0.03147
WINDOW 3	36	.05	0	0.00000
SGD	26	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	297	0.00297
FLOOR		.6	297	
ET*S				0.03749
-10LOG(ET*S)				14.3
10LOGA				23.3
NOISE REDUCTION				31.6

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN DBL QUEEN + UPGRADES + STC = 30

FLOOR AREA 297

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		268	0.00268
EXT.WALL 2	53		73	0.00037
EXT.WALL 3	60		0	0.00000
INT.WALL			351	
WINDOW 1	28	.05	0	0.00000
WINDOW 2	31	.05	25	0.01986
WINDOW 3	38	.05	0	0.00000
SGD	28	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	297	0.00297
FLOOR		.6	297	
ET*S				0.02587
-10LOG(ET*S)				15.9
10LOGA				23.3
NOISE REDUCTION				33.2

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN DBL QUEEN + UPGRADES + STC = 32

FLOOR AREA 297

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		268	0.00268
EXT.WALL 2	53		73	0.00037
EXT.WALL 3	60		0	0.00000
INT.WALL			351	
WINDOW 1	30	.05	0	0.00000
WINDOW 2	33	.05	25	0.01253
WINDOW 3	40	.05	0	0.00000
SGD	30	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	297	0.00297
FLOOR		.6	297	
ET*S				0.01855
-10LOG(ET*S)				17.3
10LOGA				23.3
NOISE REDUCTION				34.7

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN DBL QUEEN + UPGRADES + STC = 34

FLOOR AREA 297

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		268	0.00268
EXT.WALL 2	53		73	0.00037
EXT.WALL 3	60		0	0.00000
INT.WALL			351	
WINDOW 1	32	.05	0	0.00000
WINDOW 2	35	.05	25	0.00791
WINDOW 3	42	.05	0	0.00000
SGD	32	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	297	0.00297
FLOOR		.6	297	
ET*S				0.01392
-10LOG(ET*S)				18.6
10LOGA				23.3
NOISE REDUCTION				35.9

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN DBL QUEEN + UPGRADES + STC = 36

FLOOR AREA 297

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		268	0.00268
EXT.WALL 2	53		73	0.00037
EXT.WALL 3	60		0	0.00000
INT.WALL			351	
WINDOW 1	34	.05	0	0.00000
WINDOW 2	37	.05	25	0.00499
WINDOW 3	44	.05	0	0.00000
SGD	34	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	297	0.00297
FLOOR		.6	297	
ET*S				0.01100
-10LOG(ET*S)				19.6
10LOGA				23.3
NOISE REDUCTION				36.9

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN DBL QUEEN + UPGRADES + STC = 38

FLOOR AREA 297

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		268	0.00268
EXT.WALL 2	53		73	0.00037
EXT.WALL 3	60		0	0.00000
INT.WALL			351	
WINDOW 1	36	.05	0	0.00000
WINDOW 2	39	.05	25	0.00315
WINDOW 3	46	.05	0	0.00000
SGD	36	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	297	0.00297
FLOOR		.6	297	
ET*S				0.00916
-10LOG(ET*S)				20.4
10LOGA				23.3
NOISE REDUCTION				37.7

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN DBL QUEEN + UPGRADES + STC = 40

FLOOR AREA 297

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		268	0.00268
EXT.WALL 2	53		73	0.00037
EXT.WALL 3	60		0	0.00000
INT.WALL			351	
WINDOW 1	38	.05	0	0.00000
WINDOW 2	41	.05	25	0.00199
WINDOW 3	48	.05	0	0.00000
SGD	38	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	297	0.00297
FLOOR		.6	297	
ET*S				0.00800
-10LOG(ET*S)				21.0
10LOGA				23.3
NOISE REDUCTION				38.3

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN KING + UPGRADES + STC = 24

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		0	0.00000
EXT.WALL 2	53		38	0.00019
EXT.WALL 3	60		0	0.00000
INT.WALL			549	
WINDOW 1	22	.05	0	0.00000
WINDOW 2	25	.05	25	0.07906
WINDOW 3	32	.05	0	0.00000
SGD	22	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	249	0.00249
FLOOR		.6	249	
ET*S				0.08174
-10LOG(ET*S)				10.9
10LOGA				22.6
NOISE REDUCTION				27.5

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN KING + UPGRADES + STC = 26

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		0	0.00000
EXT.WALL 2	53		38	0.00019
EXT.WALL 3	60		0	0.00000
INT.WALL			549	
WINDOW 1	24	.05	0	0.00000
WINDOW 2	27	.05	25	0.04988
WINDOW 3	34	.05	0	0.00000
SGD	24	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	249	0.00249
FLOOR		.6	249	
ET*S				0.05256
-10LOG(ET*S)				12.8
10LOGA				22.6
NOISE REDUCTION				29.4

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN KING + UPGRADES + STC = 28

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		0	0.00000
EXT.WALL 2	53		38	0.00019
EXT.WALL 3	60		0	0.00000
INT.WALL			549	
WINDOW 1	26	.05	0	0.00000
WINDOW 2	29	.05	25	0.03147
WINDOW 3	36	.05	0	0.00000
SGD	26	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	249	0.00249
FLOOR		.6	249	
ET*S				0.03415
-10LOG(ET*S)				14.7
10LOGA				22.6
NOISE REDUCTION				31.3

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN KING + UPGRADES + STC = 30

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		0	0.00000
EXT.WALL 2	53		38	0.00019
EXT.WALL 3	60		0	0.00000
INT.WALL			549	
WINDOW 1	28	.05	0	0.00000
WINDOW 2	31	.05	25	0.01986
WINDOW 3	38	.05	0	0.00000
SGD	28	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	249	0.00249
FLOOR		.6	249	
ET*S				0.02254
-10LOG(ET*S)				16.5
10LOGA				22.6
NOISE REDUCTION				33.1

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN KING + UPGRADES + STC = 32

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		0	0.00000
EXT.WALL 2	53		38	0.00019
EXT.WALL 3	60		0	0.00000
INT.WALL			549	
WINDOW 1	30	.05	0	0.00000
WINDOW 2	33	.05	25	0.01253
WINDOW 3	40	.05	0	0.00000
SGD	30	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	249	0.00249
FLOOR		.6	249	
ET*S				0.01521
-10LOG(ET*S)				18.2
10LOGA				22.6
NOISE REDUCTION				34.8

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN KING + UPGRADES + STC = 34

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		0	0.00000
EXT.WALL 2	53		38	0.00019
EXT.WALL 3	60		0	0.00000
INT.WALL			549	
WINDOW 1	32	.05	0	0.00000
WINDOW 2	35	.05	25	0.00791
WINDOW 3	42	.05	0	0.00000
SGD	32	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	249	0.00249
FLOOR		.6	249	
ET*S				0.01059
-10LOG(ET*S)				19.8
10LOGA				22.6
NOISE REDUCTION				36.4

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN KING + UPGRADES + STC = 36

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		0	0.00000
EXT.WALL 2	53		38	0.00019
EXT.WALL 3	60		0	0.00000
INT.WALL			549	
WINDOW 1	34	.05	0	0.00000
WINDOW 2	37	.05	25	0.00499
WINDOW 3	44	.05	0	0.00000
SGD	34	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	249	0.00249
FLOOR		.6	249	
ET*S				0.00767
-10LOG(ET*S)				21.2
10LOGA				22.6
NOISE REDUCTION				37.8

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME RES INN KING + UPGRADES + STC = 38

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		0	0.00000
EXT.WALL 2	53		38	0.00019
EXT.WALL 3	60		0	0.00000
INT.WALL			549	
WINDOW 1	36	.05	0	0.00000
WINDOW 2	39	.05	25	0.00315
WINDOW 3	46	.05	0	0.00000
SGD	36	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	249	0.00249
FLOOR		.6	249	
ET*S				0.00583
-10LOG(ET*S)				22.3
10LOGA				22.6
NOISE REDUCTION				39.0

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME : RES INN KING + UPGRADES + STC = 40

FLOOR AREA : 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		0	0.00000
EXT.WALL 2	53		38	0.00019
EXT.WALL 3	60		0	0.00000
INT.WALL			549	
WINDOW 1	38	.05	0	0.00000
WINDOW 2	41	.05	25	0.00199
WINDOW 3	48	.05	0	0.00000
SGD	38	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	249	0.00249
FLOOR		.6	249	
ET*S				0.00467
-10LOG(ET*S)				23.3
10LOGA				22.6
NOISE REDUCTION				39.9

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY KING + UPGRADES + STC = 24

FLOOR AREA 239

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		171	0.00171
EXT.WALL 2	53		99	0.00050
EXT.WALL 3	60		0	0.00000
INT.WALL			282	
WINDOW 1	22	.05	0	0.00000
WINDOW 2	25	.05	25	0.07906
WINDOW 3	32	.05	0	0.00000
SGD	22	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	239	0.00239
FLOOR		.6	239	
ET*S				0.08365
-10LOG(ET*S)				10.8
10LOGA				22.4
NOISE REDUCTION				27.1

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY KING + UPGRADES + STC = 26

FLOOR AREA 239

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		171	0.00171
EXT.WALL 2	53		99	0.00050
EXT.WALL 3	60		0	0.00000
INT.WALL			282	
WINDOW 1	24	.05	0	0.00000
WINDOW 2	27	.05	25	0.04988
WINDOW 3	34	.05	0	0.00000
SGD	24	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	239	0.00239
FLOOR		.6	239	
ET*S				0.05448
-10LOG(ET*S)				12.6
10LOGA				22.4
NOISE REDUCTION				29.0

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY KING + UPGRADES + STC = 28

FLOOR AREA 239

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		171	0.00171
EXT.WALL 2	53		99	0.00050
EXT.WALL 3	60		0	0.00000
INT.WALL			282	
WINDOW 1	26	.05	0	0.00000
WINDOW 2	29	.05	25	0.03147
WINDOW 3	36	.05	0	0.00000
SGD	26	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	239	0.00239
FLOOR		.6	239	
ET*S				0.03607
-10LOG(ET*S)				14.4
10LOGA				22.4
NOISE REDUCTION				30.8

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY KING + UPGRADES + STC = 30

FLOOR AREA 239

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		171	0.00171
EXT.WALL 2	53		99	0.00050
EXT.WALL 3	60		0	0.00000
INT.WALL			282	
WINDOW 1	28	.05	0	0.00000
WINDOW 2	31	.05	25	0.01986
WINDOW 3	38	.05	0	0.00000
SGD	28	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	239	0.00239
FLOOR		.6	239	
ET*S				0.02445
-10LOG(ET*S)				16.1
10LOGA				22.4
NOISE REDUCTION				32.5

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY KING + UPGRADES + STC = 32

FLOOR AREA 239

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		171	0.00171
EXT.WALL 2	53		99	0.00050
EXT.WALL 3	60		0	0.00000
INT.WALL			282	
WINDOW 1	30	.05	0	0.00000
WINDOW 2	33	.05	25	0.01253
WINDOW 3	40	.05	0	0.00000
SGD	30	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	239	0.00239
FLOOR		.6	239	
ET*S				0.01713
-10LOG(ET*S)				17.7
10LOGA				22.4
NOISE REDUCTION				34.0

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY KING + UPGRADES + STC = 34

FLOOR AREA 239

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		171	0.00171
EXT.WALL 2	53		99	0.00050
EXT.WALL 3	60		0	0.00000
INT.WALL			282	
WINDOW 1	32	.05	0	0.00000
WINDOW 2	35	.05	25	0.00791
WINDOW 3	42	.05	0	0.00000
SGD	32	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	239	0.00239
FLOOR		.6	239	
ET*S				0.01250
-10LOG(ET*S)				19.0
10LOGA				22.4
NOISE REDUCTION				35.4

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY KING + UPGRADES + STC = 36

FLOOR AREA 239

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		171	0.00171
EXT.WALL 2	53		99	0.00050
EXT.WALL 3	60		0	0.00000
INT.WALL			282	
WINDOW 1	34	.05	0	0.00000
WINDOW 2	37	.05	25	0.00499
WINDOW 3	44	.05	0	0.00000
SGD	34	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	239	0.00239
FLOOR		.6	239	
ET*S				0.00958
-10LOG(ET*S)				20.2
10LOGA				22.4
NOISE REDUCTION				36.5

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY KING + UPGRADES + STC = 38

FLOOR AREA 239

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		171	0.00171
EXT.WALL 2	53		99	0.00050
EXT.WALL 3	60		0	0.00000
INT.WALL			282	
WINDOW 1	36	.05	0	0.00000
WINDOW 2	39	.05	25	0.00315
WINDOW 3	46	.05	0	0.00000
SGD	36	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	239	0.00239
FLOOR		.6	239	
ET*S				0.00774
-10LOG(ET*S)				21.1
10LOGA				22.4
NOISE REDUCTION				37.5

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY KING + UPGRADES + STC = 40

FLOOR AREA 239

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		171	0.00171
EXT.WALL 2	53		99	0.00050
EXT.WALL 3	60		0	0.00000
INT.WALL			282	
WINDOW 1	38	.05	0	0.00000
WINDOW 2	41	.05	25	0.00199
WINDOW 3	48	.05	0	0.00000
SGD	38	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	239	0.00239
FLOOR		.6	239	
ET*S				0.00658
-10LOG(ET*S)				21.8
10LOGA				22.4
NOISE REDUCTION				38.2

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY DBL QUEEN + UPGRADES + STC = 24

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		99	0.00099
EXT.WALL 2	53		0	0.00000
EXT.WALL 3	60		0	0.00000
INT.WALL			456	
WINDOW 1	22	.05	25	0.15774
WINDOW 2	25	.05	0	0.00000
WINDOW 3	32	.05	0	0.00000
SGD	22	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	249	0.00249
FLOOR		.6	249	
ET*S				0.16122
-10LOG(ET*S)				7.9
10LOGA				22.6
NOISE REDUCTION				24.6

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY DBL QUEEN + UPGRADES + STC = 26

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		99	0.00099
EXT.WALL 2	53		0	0.00000
EXT.WALL 3	60		0	0.00000
INT.WALL			456	
WINDOW 1	24	.05	25	0.09953
WINDOW 2	27	.05	0	0.00000
WINDOW 3	34	.05	0	0.00000
SGD	24	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	249	0.00249
FLOOR		.6	249	
ET*S				0.10301
-10LOG(ET*S)				9.9
10LOGA				22.6
NOISE REDUCTION				26.5

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY DBL QUEEN + UPGRADES + STC = 28

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		99	0.00099
EXT.WALL 2	53		0	0.00000
EXT.WALL 3	60		0	0.00000
INT.WALL			456	
WINDOW 1	26	.05	25	0.06280
WINDOW 2	29	.05	0	0.00000
WINDOW 3	36	.05	0	0.00000
SGD	26	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	249	0.00249
FLOOR		.6	249	
ET*S				0.06628
-10LOG(ET*S)				11.8
10LOGA				22.6
NOISE REDUCTION				28.4

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY DBL QUEEN + UPGRADES + STC = 30

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		99	0.00099
EXT.WALL 2	53		0	0.00000
EXT.WALL 3	60		0	0.00000
INT.WALL			456	
WINDOW 1	28	.05	25	0.03962
WINDOW 2	31	.05	0	0.00000
WINDOW 3	38	.05	0	0.00000
SGD	28	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	249	0.00249
FLOOR		.6	249	
ET*S				0.04310
-10LOG(ET*S)				13.7
10LOGA				22.6
NOISE REDUCTION				30.3

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY DBL QUEEN + UPGRADES + STC = 32

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		99	0.00099
EXT.WALL 2	53		0	0.00000
EXT.WALL 3	60		0	0.00000
INT.WALL			456	
WINDOW 1	30	.05	25	0.02500
WINDOW 2	33	.05	0	0.00000
WINDOW 3	40	.05	0	0.00000
SGD	30	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	249	0.00249
FLOOR		.6	249	
ET*S				0.02848
-10LOG(ET*S)				15.5
10LOGA				22.6
NOISE REDUCTION				32.1

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY DBL QUEEN + UPGRADES + STC = 34

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		99	0.00099
EXT.WALL 2	53		0	0.00000
EXT.WALL 3	60		0	0.00000
INT.WALL			456	
WINDOW 1	32	.05	25	0.01577
WINDOW 2	35	.05	0	0.00000
WINDOW 3	42	.05	0	0.00000
SGD	32	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	249	0.00249
FLOOR		.6	249	
ET*S				0.01925
-10LOG(ET*S)				17.2
10LOGA				22.6
NOISE REDUCTION				33.8

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY DBL QUEEN + UPGRADES + STC = 36

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		99	0.00099
EXT.WALL 2	53		0	0.00000
EXT.WALL 3	60		0	0.00000
INT.WALL			456	
WINDOW 1	34	.05	25	0.00995
WINDOW 2	37	.05	0	0.00000
WINDOW 3	44	.05	0	0.00000
SGD	34	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	249	0.00249
FLOOR		.6	249	
ET*S				0.01343
-10LOG(ET*S)				18.7
10LOGA				22.6
NOISE REDUCTION				35.4

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY DBL QUEEN + UPGRADES + STC = 38

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		99	0.00099
EXT.WALL 2	53		0	0.00000
EXT.WALL 3	60		0	0.00000
INT.WALL			456	
WINDOW 1	36	.05	25	0.00628
WINDOW 2	39	.05	0	0.00000
WINDOW 3	46	.05	0	0.00000
SGD	36	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	249	0.00249
FLOOR		.6	249	
ET*S				0.00976
-10LOG(ET*S)				20.1
10LOGA				22.6
NOISE REDUCTION				36.7

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY DBL QUEEN + UPGRADES + STC = 40

FLOOR AREA 249

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		99	0.00099
EXT.WALL 2	53		0	0.00000
EXT.WALL 3	60		0	0.00000
INT.WALL			456	
WINDOW 1	38	.05	25	0.00396
WINDOW 2	41	.05	0	0.00000
WINDOW 3	48	.05	0	0.00000
SGD	38	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	249	0.00249
FLOOR		.6	249	
ET*S				0.00744
-10LOG(ET*S)				21.3
10LOGA				22.6
NOISE REDUCTION				37.9

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY NW KING (101-401) + UPGRADES + STC = 24

FLOOR AREA 383

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		132	0.00132
EXT.WALL 2	53		137	0.00069
EXT.WALL 3	60		0	0.00000
INT.WALL			357	
WINDOW 1	22	.05	25	0.15774
WINDOW 2	25	.05	25	0.07906
WINDOW 3	32	.05	0	0.00000
SGD	22	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	383	0.00383
FLOOR		.6	383	
ET*S				0.24263
-10LOG(ET*S)				6.2
10LOGA				24.3
NOISE REDUCTION				24.4

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY NW KING (101-401) + UPGRADES + STC = 26

FLOOR AREA 383

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		132	0.00132
EXT.WALL 2	53		137	0.00069
EXT.WALL 3	60		0	0.00000
INT.WALL			357	
WINDOW 1	24	.05	25	0.09953
WINDOW 2	27	.05	25	0.04988
WINDOW 3	34	.05	0	0.00000
SGD	24	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	383	0.00383
FLOOR		.6	383	
ET*S				0.15524
-10LOG(ET*S)				8.1
10LOGA				24.3
NOISE REDUCTION				26.4

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY NW KING (101-401) + UPGRADES + STC = 28

FLOOR AREA 383

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		132	0.00132
EXT.WALL 2	53		137	0.00069
EXT.WALL 3	60		0	0.00000
INT.WALL			357	
WINDOW 1	26	.05	25	0.06280
WINDOW 2	29	.05	25	0.03147
WINDOW 3	36	.05	0	0.00000
SGD	26	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	383	0.00383
FLOOR		.6	383	
ET*S				0.10011
-10LOG(ET*S)				10.0
10LOGA				24.3
NOISE REDUCTION				28.3

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY NW KING (101-401) + UPGRADES + STC = 30

FLOOR AREA 383

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		132	0.00132
EXT.WALL 2	53		137	0.00069
EXT.WALL 3	60		0	0.00000
INT.WALL			357	
WINDOW 1	28	.05	25	0.03962
WINDOW 2	31	.05	25	0.01986
WINDOW 3	38	.05	0	0.00000
SGD	28	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	383	0.00383
FLOOR		.6	383	
ET*S				0.06532
-10LOG(ET*S)				11.8
10LOGA				24.3
NOISE REDUCTION				30.1

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY NW KING (101-401) + UPGRADES + STC = 32

FLOOR AREA 383

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		132	0.00132
EXT.WALL 2	53		137	0.00069
EXT.WALL 3	60		0	0.00000
INT.WALL			357	
WINDOW 1	30	.05	25	0.02500
WINDOW 2	33	.05	25	0.01253
WINDOW 3	40	.05	0	0.00000
SGD	30	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	383	0.00383
FLOOR		.6	383	
ET*S				0.04337
-10LOG(ET*S)				13.6
10LOGA				24.3
NOISE REDUCTION				31.9

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY NW KING (101-401) + UPGRADES + STC = 34

FLOOR AREA 383

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		132	0.00132
EXT.WALL 2	53		137	0.00069
EXT.WALL 3	60		0	0.00000
INT.WALL			357	
WINDOW 1	32	.05	25	0.01577
WINDOW 2	35	.05	25	0.00791
WINDOW 3	42	.05	0	0.00000
SGD	32	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	383	0.00383
FLOOR		.6	383	
ET*S				0.02952
-10LOG(ET*S)				15.3
10LOGA				24.3
NOISE REDUCTION				33.6

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY NW KING (101-401) + UPGRADES + STC = 36

FLOOR AREA 383

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		132	0.00132
EXT.WALL 2	53		137	0.00069
EXT.WALL 3	60		0	0.00000
INT.WALL			357	
WINDOW 1	34	.05	25	0.00995
WINDOW 2	37	.05	25	0.00499
WINDOW 3	44	.05	0	0.00000
SGD	34	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	383	0.00383
FLOOR		.6	383	
ET*S				0.02078
-10LOG(ET*S)				16.8
10LOGA				24.3
NOISE REDUCTION				35.1

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY NW KING (101-401) + UPGRADES + STC = 38

FLOOR AREA 383

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		132	0.00132
EXT.WALL 2	53		137	0.00069
EXT.WALL 3	60		0	0.00000
INT.WALL			357	
WINDOW 1	36	.05	25	0.00628
WINDOW 2	39	.05	25	0.00315
WINDOW 3	46	.05	0	0.00000
SGD	36	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	383	0.00383
FLOOR		.6	383	
ET*S				0.01526
-10LOG(ET*S)				18.2
10LOGA				24.3
NOISE REDUCTION				36.4

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME HOLIDAY NW KING (101-401) + UPGRADES + STC = 40

FLOOR AREA 383

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		132	0.00132
EXT.WALL 2	53		137	0.00069
EXT.WALL 3	60		0	0.00000
INT.WALL			357	
WINDOW 1	38	.05	25	0.00396
WINDOW 2	41	.05	25	0.00199
WINDOW 3	48	.05	0	0.00000
SGD	38	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	383	0.00383
FLOOR		.6	383	
ET*S				0.01178
-10LOG(ET*S)				19.3
10LOGA				24.3
NOISE REDUCTION				37.6

CHRISTOPHER JEAN & ASSOCIATES, INC.
ACOUSTICAL CONSULTING SERVICES

APPENDIX 7

PLUMBING AND ELECTRICAL INSTALLATIONS

P. O. BOX 2325 • FULLERTON, CALIFORNIA • 92837
PHONE: 714-805-0115

PLUMBING NOISE REDUCTION REQUIREMENTS FOR

COMPLIANCE WITH THE CALIFORNIA CODE OF REGULATIONS

TITLE 24, PART 2, APPENDIX CHAPTER 35

REQUIRED PLUMBING DESIGN FEATURE IN COMON WALL AND FLOOR/CEILING ASSEMBLIES

The plumbing system, by its nature, can degrade the acoustical integrity of a common wall or floor/ceiling assembly. This is primarily due to the fact that the plumbing system, a sound carrier and a sound source, is generally attached to the studs, plates, joists and drywall of a building's walls and floors. In order to alleviate the problem of plumbing system noise, one hundred percent of the plumbing system must be isolated from the building structure (not just at the common assemblies). Special installation requirements are necessary in order to:

(1) reduce the level of noise from the plumbing system, and

(2) isolate the total plumbing system from the building structure.

These special isolation procedures may be accomplished by using an approved commercial isolation system. Hard plastic "isolators" are **NOT** acceptable. Examples of approved commercial isolation systems in order of preference are:

(1) "Acousto-Plumb" ™ system by Specialty Products, Inc. (www.ispproducts.com),

(2) Holdrite Silencer System by Holdrite, Inc. (www.holdrite.com), and

(3) the felt lined series of isolators, clamps and hangers from Tolco, Inc.

Only when appropriate commercial isolation products are not available for unusual applications or extra large pipe sizes, will it be acceptable to use high density, 1/4" thick, 2" wide, adhesive backed felt wrap and/or 1/2" thick pre-formed, self-adhesive foam rubber pipe insulation such as Armaflex or Rubatex. If the felt wrap or pre-formed pipe insulation is used, great care must be taken not to compress the insulation material when strapping or anchoring the attachment points. Use of expanding foam products as plumbing isolation is **strictly prohibited**.

SUPPLY LINES

- All hot and cold water pipes, fittings and valves shall NEVER come in direct contact with either the building structure framing or drywall. Supply lines are to be isolated using Acousto-Plumb, Holdrite Silencer System, Tolco I.S.P. felt lined isolator products, 1/4" high density felt wrap or 1/2" pre-formed pipe insulation. Acousto-Plumb products and installation details can be found at www.lspproducts.com. Holdrite Silencer System products and installation details can be found at www.holdrite.com. Tolco I.S.P. products can be found at www. cooperindustries.com. Installation details for use of felt wrap or pre-formed pipe insulation are available upon request and approval. If felt wrap or pre-formed pipe insulation are used (and only with prior written approval by the acoustical consultant when appropriate commercial isolation products cannot be located), these installation details must be followed to the letter. No deviations from these details will be allowed.

- All sink and shower faucets, spouts and risers shall be isolated with resilient gaskets that are positioned between the faucet, spout or riser and its mounting surface.

- Water supply stub-outs shall be temporarily isolated from the drywall using the Acousto-Sleeve ™ during drywall installation, and then permanently isolated using the Acousto-Scutcheon ™ or resilient caulking and a standard plumbing escutcheon.

- Water pressure shall not exceed 65 psi.

- Shower head flow restrictors shall be used to limit water flow to less than three (3) gallons per minute.

- The pipe stubs commonly installed to combat water hammer are not effective. A commercially produced water hammer device consisting of a bellows, similar to that made by Plumbing Products, Inc., is recommended.

- Sections of the plumbing supply system employing PEX (cross linked polyethylene tubing) do not require acoustical isolation except where it transitions to or from conventional copper lines.

WASTE LINES

- The cavity under plastic or fiberglass tubs and showers shall be packed with fiberglass or spray-on insulation materials and/or lightweight concrete pours. The bottoms of such tubs shall be blocked or supported by lightweight concrete to reduce drumming.

- All waste lines above the slab and at the penetrations of any floor/ceiling assemblies and any walls (including non-common walls) shall be cast iron. The use of ABS waste lines is not recommended. If ABS is used, the entire framing cavity surrounding the ABS pipe shall be completely packed with fiberglass, mineral wool or spray–on adhesive cellulose insulation materials. All elbows below toilet and tub waste outlets shall be isolated from all positioning blocks using carpet padding or high-density 1/4" felt material. The entire framing cavity surrounding these elbows shall be completely packed with fiberglass, mineral wool or spray-on adhesive cellulose insulation materials.

- Waste lines of a diameter greater than two and a half inches (2.5") shall never be installed in a wall framed with less than 2" by 6" studs. Walls framed with 2" by 4" studs simply don't allow sufficient clearance to properly insulate and isolate waste lines and/or avoid pipe contact with the drywall.

Failure to COMPLETELY isolate the plumbing system from the building structure will result in a significant transfer of plumbing noise into the building. Therefore, it is important that all of the above measures and techniques are employed. Collectively, these measures and techniques act as parts of a complete system, each designed to perform a particular function of the total effort. Any circumvention of the function of any one component, whether intentional or not, will ultimately lessen the effectiveness of the entire system. **QUALITY CONTROL IS CRITICAL TO PROPER PLUMBING SYSTEM ISOLATION.**

ELECTRICAL SYSTEM INSTALLATION NOTES

The following items shall be incorporated into the building plans:

COMMON WALLS

- Electrical outlets, switches, phone jacks, television antennae boxes and computer outlet boxes installed in opposite sides of a common wall shall be offset a minimum of 24" to comply with the fire code. This offset is not needed for acoustical reasons if insulation is used in the framing cavities and Lowry's #10 putty pads or 3M fire pads are applied around the backs and sides of all outlets, switches, phone jacks, etc.

- All electrical outlets, switches, phone jacks, television antennae boxes and computer outlet boxes installed in common walls shall be backed by and Lowry's #10 putty pads, 3M fire pads or equivalent. Pads shall be stapled to the studs to insure that they remain in place indefinitely (the adhesive backing of the pads deteriorates over time).

- Wiring shall avoid crossing over the air gap of common walls. Where unavoidable, wiring crossovers between common wall studs shall include a loop where the depth is equal to its width.

- Electrical panel boxes, fixture boxes or outlet boxes greater than 25 square inches shall be set in raised boxes that do not touch the opposite side of the common wall.

COMMON FLOOR/CEILINGS

- Recessed lighting shall be set in recessed and airtight boxes made of plywood or drywall.

- All other precautions applicable to common wall installations shall also apply to common floor/ceiling installations.

TRAFFIC IMPACT STUDY

For

Valencia Springhill Suites
Plus Residence Inn

Santa Clarita, California

Submitted To:

Excel Hotel Group
10660 Scripps Ranch Boulevard, Suite 100,
San Diego, California 92131

Submitted By:

Darnell & Associates, Inc.
4411 Mercury Street, Suite 207A
San Diego California, 92111

Revised: December 5, 2016
Revised: November 15, 2016
Revised: November 1, 2016
Original: September 14, 2016

Darnell & Associates, Inc.
TRANSPORTATION PLANNING & TRAFFIC ENGINEERING

December 5, 2016

Neil Patel
Excel Hotel Group
10660 Scripps Ranch Boulevard, Suite 100,
San Diego, California 92123

D&A Ref. No.: 160605

Subject: Traffic Impact Study for the Proposed Valencia Springhill Suites Plus the Residence Inn located in Santa Clarita, California

Dear Mr. Neil Patel:

In accordance with your authorization, Darnell & Associates, Inc. (D&A) has prepared this Traffic Impact Study assessing the impacts associated with the proposed project located on the southside of Wayne Mills Place in the City of Santa Clarita.

The Traffic Impact Study analyzes the traffic impacts related to the project on the surrounding roadways and intersections under the following conditions: Existing and Existing Plus Project Conditions. The report has been revised to respond to City Traffic Engineers comments dated October 18, 2016.

If you have any questions, please feel free to contact the office.

Sincerely,

DARNELL & ASSOCIATES, INC.

REGISTERED PROFESSIONAL ENGINEER
BILL E. DARNELL
No. 22338
CIVIL
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
BILL E. DARNELL
No. 539
TRAFFIC
STATE OF CALIFORNIA

Bill E Darnell

Bill E. Darnell, P.E.
Firm Principal
RCE 22338

Date Signed: 12/5/2016

Date Signed: 12/5/2016

BED/jam
160605 - Springhill Suites Residential Inn-Valencia Traffic Study_ Dec 5 2016

TRAFFIC IMPACT STUDY

FOR

VALENCIA SPRINGHILL SUITES PLUS RESIDENCE INN

SANTA CLARITA, CALIFORNIA

Submitted To:

Excel Hotel Group
10660 Scripps Ranch Boulevard, Suite 100,
San Diego, California 92131

Submitted By:

Darnell & Associates, Inc.
4411 Mercury Street, Suite 207A
San Diego California, 92111
(619) 233-9373

December 5, 2016
160605 - Springhill Suites Residential Inn-Valencia Traffic Study_ Dec 5 2016

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICIES

APPENDIX A

- 24-Hour Segment Counts
- AM/PM Peak Hour Turn Counts

APPENDIX B

- Existing Conditions Analysis Worksheets

APPENDIX C

- Existing + Project Conditions Analysis Worksheets

APPENDIX D

- 2018 Opening Day Conditions Analysis Worksheets

APPENDIX E

- 2018 Opening Day Plus Project Conditions Analysis Worksheets

SECTION I – INTRODUCTION

This traffic study evaluates the traffic conditions associated with the proposed Valencia Springhill plus Residence Inn project (herein referred to as "the project") located at 27413 Wayne Mills Place in the City of Santa Clarita, CA. Figure 1 illustrates the location of the project site in the region.

PROJECT DESCRIPTION

The project site is generally located on the south side of Wayne Mills Place, east of I-5, and west of Tourney Road. The existing site currently is occupied by a 120-Room Best Western Hotel. The project will construct a 182-Room Springhill Suites/Residence Inn and a 108-room Holiday Inn Express on the existing Best Western Site. Access to the project will be through an existing driveway located on Wayne Mills Place. Figure 2 illustrates the project site plan.

SCENARIOS STUDIED

The following list contains the scenarios analyzed for the project:

Existing Conditions: This scenario refers to the conditions at the time peak hour turning movement volume counts were obtained in October 2016 and account for the existing lane configurations at the study intersections and roadway segments.

Existing Plus Project Conditions: This scenario includes the project traffic, which is added to the existing traffic volumes.

2018 Opening Day Conditions: This scenario includes the project traffic, with 3% per year (6 % total) ambient growth added to the existing traffic volumes.

LEVEL OF SERVICE

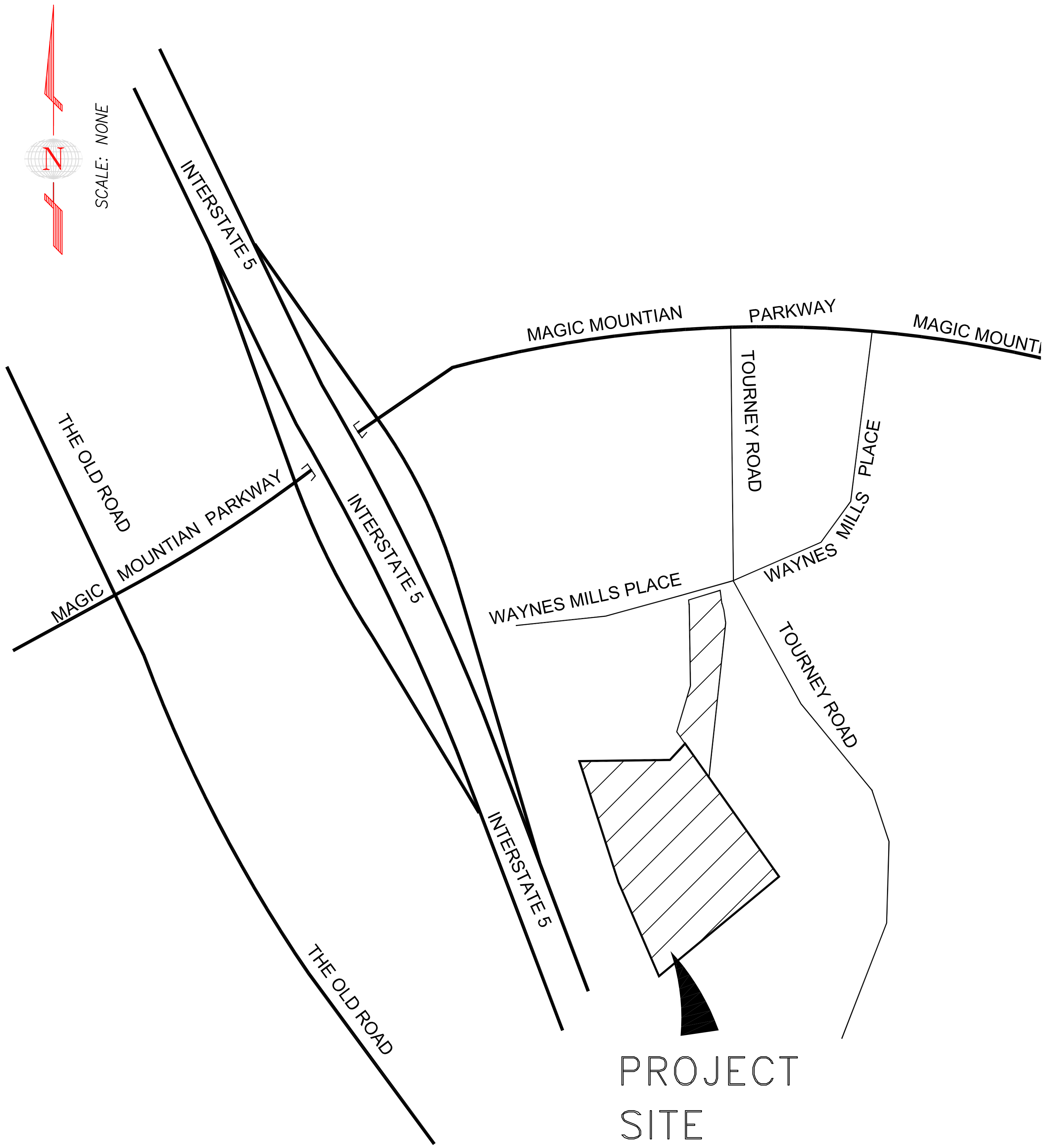
Level of Service (LOS) is a professional industry standard by which the operating conditions of a given roadway segment or intersection are measured. Level of Service is defined on a scale of A to F; where LOS "A" represents the best operating conditions and LOS "F" represents the worst operating conditions. LOS "A" facilities are characterized as having free flowing traffic conditions with no restrictions on maneuvering or operating speeds; traffic volumes are low and travel speeds are high. LOS "F" facilities are characterized as having forced flow with many stoppages and low operating speeds.

For all signalized study area intersections, the Highway Capacity Manual (HCM) methodology is utilized to estimate the LOS. The HCM method estimates the LOS based on intersection delay.

For all unsignalized area intersections, the Highway Capacity Manual (HCM) methodology is utilized to estimate the LOS. The HCM method estimates the LOS based on intersection delay.

LOS along the roadway segments in the study area is determined utilizing the City's volume to capacity at urban arterial highways.

Table 1 shows the criteria used for intersections. Table 2 summarizes the criteria used along arterial roadways. In the City of Santa Clarita, LOS "D" is considered the acceptable threshold for intersections and roadway segments.

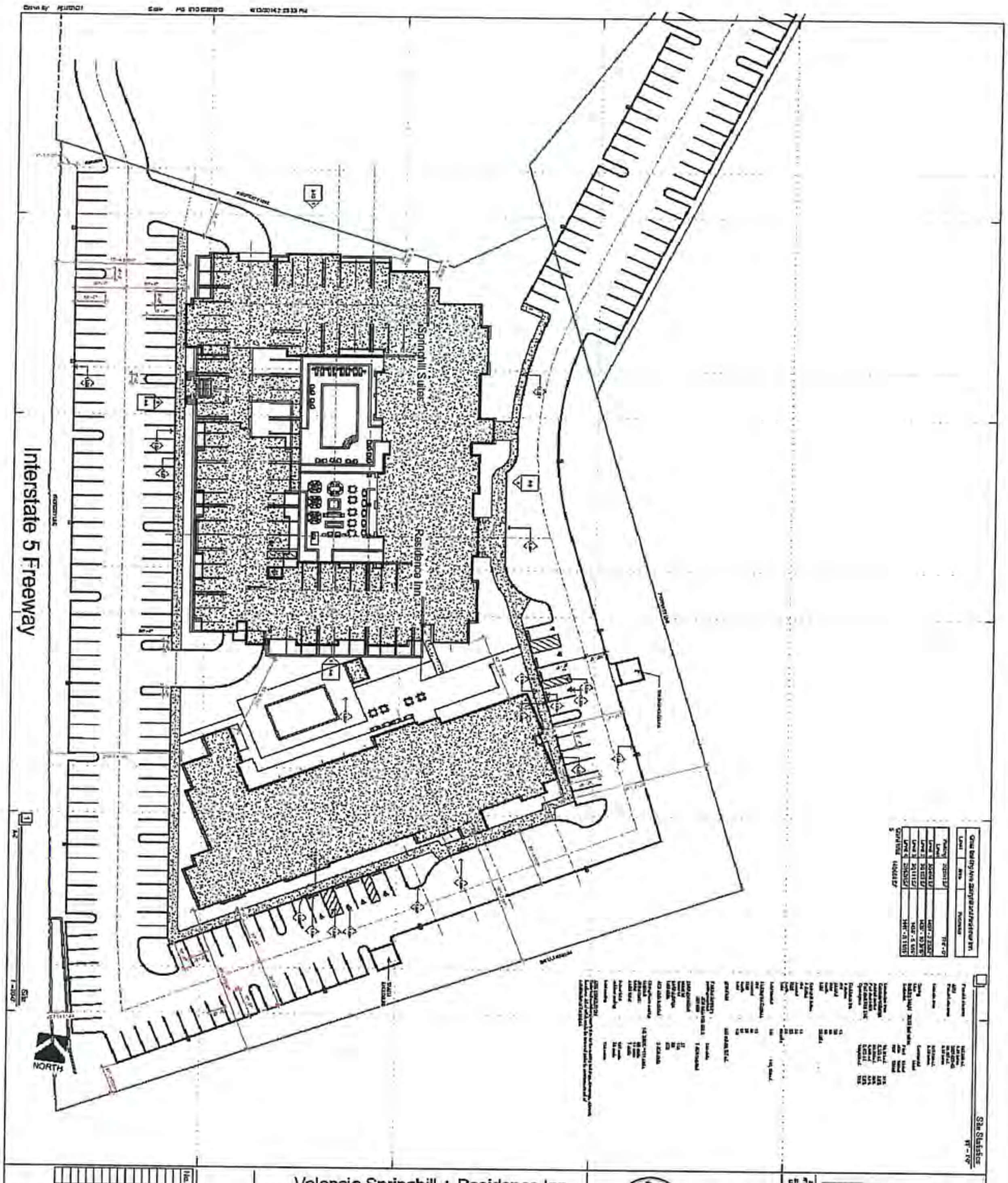


REGISTERED PROFESSIONAL ENGINEER
BILL E. DARNELL
No. 22338
Exp. 9-30-17
CIVIL
STATE OF CALIFORNIA

Darnell & ASSOCIATES, INC.
2870 MERCURY STREET, SUITE 207A
SAN DIEGO, CA 92111
(619) 233-9373

DWG: 160605-DD DATE: DECEMBER 5, 2016 BY: JAB

FIGURE 1
VICINITY MAP



Darnell & ASSOCIATES, INC.

FIGURE 2
PROJECT SITE PLAN

160605-AA.dwg 09-14-16 JAM

Table 1 - Level of Service Criteria at Intersections		
LOS	Intersections	
	Average Control Delay (Seconds/Vehicle)	Unsignalized Delay (Seconds/Vehicle)
A	≤ 10	Less than or Equal to 10.0
B	$> 10 - 20$	10.0 to 15.0
C	>20 to 35	15.0 to 25.0
D	>35 – 55	25.0 to 35.0
E	>55 – 80	35.0 to 50.0
F	> 80	> 50.0

The delay ranges shown are based on the 2010 Highway Capacity Manual (HCM)
LOS = Level of Service;

Table 2 - Level of Service Criteria Along Arterial Roadways					
LOS	8-Lane Divided	6-Lane Divided	4-Lane Divided	4-Lane Undivided	2-Lane Undivided
A	48,000	36,000	24,000	16,000	5,000
B	54,000	40,400	27,000	18,000	7,500
C	60,000	45,000	30,000	20,000	10,000
D	66,000	49,500	33,000	22,000	12,500
E	72,000	54,000	36,000	24,000	15,000
F	This condition represents system breakdown and does not have a specific relationship to service volumes.				

The values shown in the table are referenced from the City of Santa Clarita General Plan Circulation Element

ANALYSIS METHODOLOGY

The intersection analysis evaluated the operations of the study area intersections during a typical weekday for the AM and PM peak periods. The AM peak is defined as the time period between 7:00 and 9:00 AM. The PM peak is defined as the time period between 4:00 and 6:00 PM. The signalized intersections were analyzed using the Intersection Capacity Utilization (ICU) procedures with lane capacity of 1,750 vehicles per lane. Synchro 8 was used as the software program to evaluate the operations at unsignalized intersections.

REPORT ORGANIZATION

Following this section, Section II evaluates the existing roadway characteristics and traffic conditions surrounding the project area. Section III examines the project trip generation and distribution assumptions. Section IV analyzes the traffic for existing plus project conditions. Section V provides recommended mitigation measures. Section VII summarizes the report's findings and conclusions.

SECTION II - EXISTING CONDITIONS

This section of the traffic study is intended to assess the existing conditions of the roadways and intersections within the vicinity of the project to determine travel flow and/or delay difficulties, if any, that exist prior to adding the traffic generated by the proposed project. The existing conditions analysis establishes a base condition which is used to assess the other scenarios discussed in this report.

Darnell & Associates, Inc. (D&A) conducted a field review of the area surrounding the project in June 2016. The existing roadway geometrics are illustrated in Figure 3.

EXISTING ROADWAY CHARACTERISTICS

The key segments analyzed in the study area are identified below:

Magic Mountain Parkway: Magic Mountain Parkway is a six-lane divided roadway in the study area with painted medians and is classified as a major highway. The roadway generally runs in the east-west direction. Parking is restricted on both sides of the roadway and the posted speed limit is 50 miles per hour (mph) based on the City's Circulation Element, an improvement to restripe the roadway from 6-lanes to 8-lanes.

Tourney Road: Tourney Road is a three-lane roadway with a center two-way left-turning lane in the study area and is classified as a secondary highway. The roadway generally runs in the north-south direction. Bicycle lanes and parking are provided on both sides of the roadway. There are no posted speed limit signs in the immediate vicinity of the project.

Wayne Mills Place: Wayne Mills Place is a two-lane roadway with a center two-way left-turning lane. At Tourney Road it provides one-lane westbound, a painted median, a shared eastbound left and through lane and a exclusive right turn lane.

ROADWAY SEGMENT DAILY TRAFFIC

Daily traffic volume data were obtained along the study area roadway segments on Thursday, July 28, 2016 and October 25, 2016. The July 28, 2016 counts were then adjusted using the October 25, 2016 peak hour counts. Analysis of the July 28, 2016 traffic counts concluded that traffic on Magic Mountain Parkway are impacted in the summer months by traffic generated by Magic Mountain. Review of the July 28, 2016 and October 25, 2016 traffic counts allowed the conclusion that the July daily traffic volumes can be adjusted to represent the non-summer traffic conditions. Figure 4 presents the adjusted counts with 10.5 percent reduction on Magic Mountain Parkway west of Interstate 5 and a 3.7 percent reduction west of Tourney Road. A copy of the October 25, 2016 counts are presented in Appendix A. The roadway segments analyzed are:

- Magic Mountain Parkway west of Old Road;
- Magic Mountain Parkway west of Tourney Road
- Magic Mountain Parkway east of Tourney Road;
- Tourney Road between Magic Mountain Parkway and Wayne Mills Place;
- Tourney Road south of Wayne Mills Place; and
- Wayne Mills Place west of Tourney Road.

The Study Area limits were established based on City of Santa Clarita Guidelines to address roadways and intersections that the project would add 50 or more peak hour direction trips.

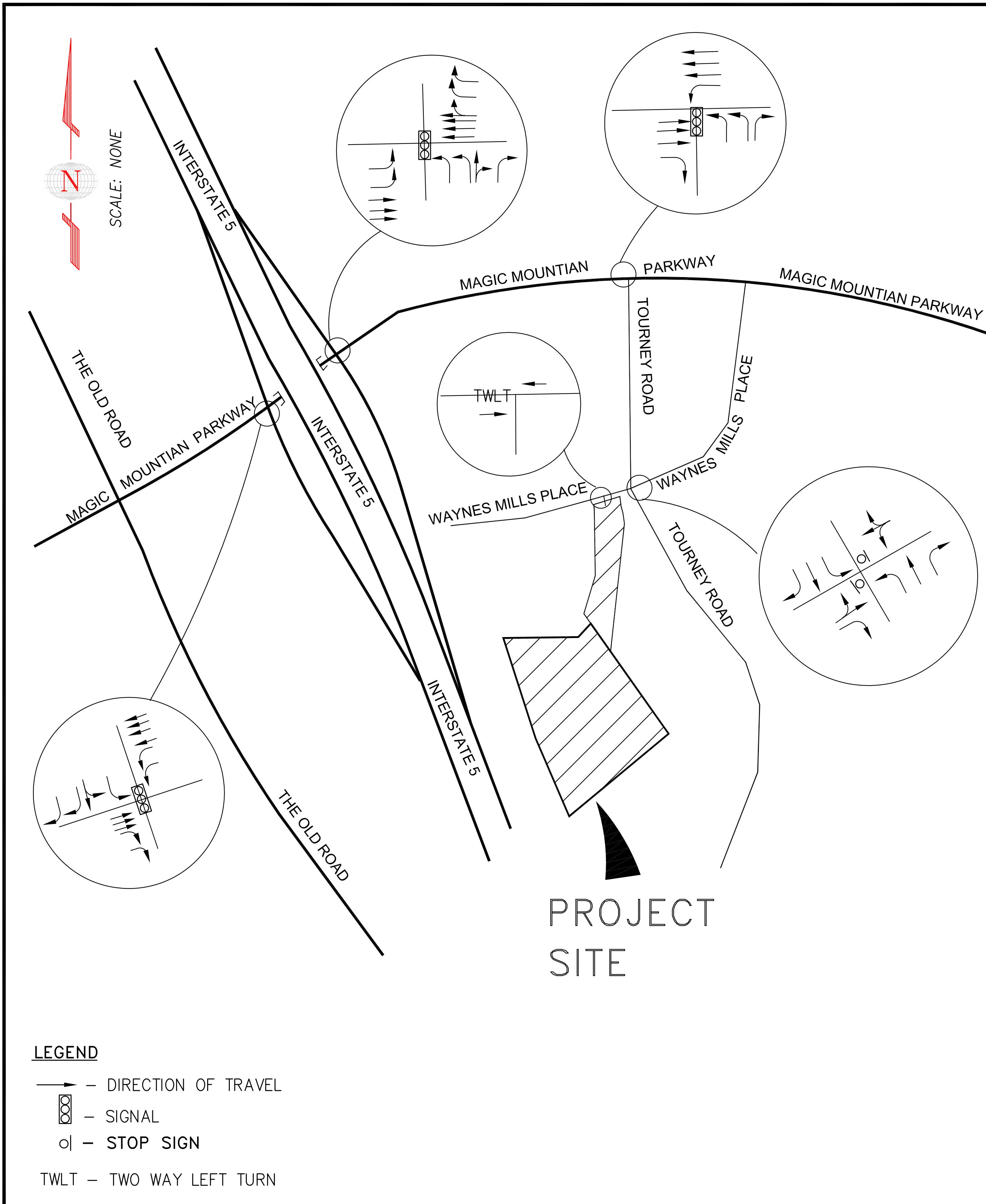
KEY INTERSECTIONS

Figure 3 provides intersection configurations and traffic control for the key intersections. The key intersections analyzed in the study area are identified below:

- I-5 SB Ramps/Magic Mountain Parkway (signal);
- I-5 NB Ramps/Magic Mountain Parkway (signal);
- Tourney Road/Magic Mountain Parkway (signal);
- Tourney Road/Wayne Mills Place (two-way stopped control)

INTERSECTION TRAFFIC COUNTS

Peak-hour traffic volume data were obtained at the study area intersections on October 25, 2016. Figure 4 presents the existing conditions traffic volumes used in this analysis. A copy of the count worksheet is included in Appendix A.



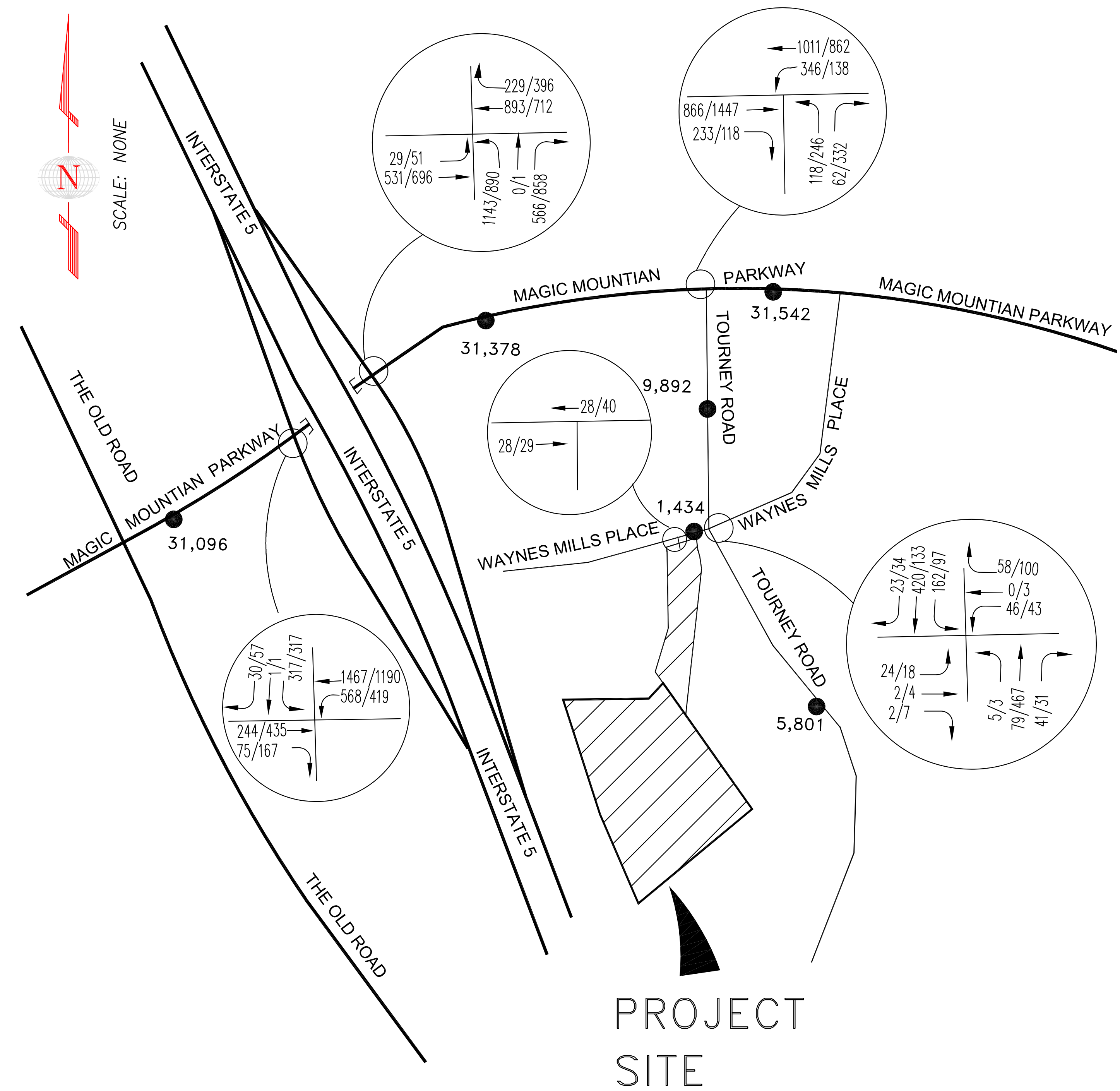
PROFESSIONAL REGISTERED ENGINEER
BILL E. DARNELL
No. 22338
Exp. 9-30-17
CIVIL
STATE OF CALIFORNIA

Darnell & ASSOCIATES, INC.
2870 MERCURY STREET, SUITE 207A
SAN DIEGO, CA 92111
(619) 233-9373

DWG: 160605-DD DATE: DECEMBER 5, 2016 BY: JAB

FIGURE 3

EXISTING ROADWAY GEOMETRY



LEGEND

→ – DIRECTION OF TRAVEL

XX/YY – AM/PM PEAK HOUR TRAFFIC VOLUMES

– SIGNAL

o| – STOP SIGN

REGISTERED PROFESSIONAL ENGINEER
BILL E. DARNELL
No. 22338
Exp. 9-30-17
CIVIL
STATE OF CALIFORNIA

Darnell & ASSOCIATES, INC.
2870 MERCURY STREET, SUITE 207A
SAN DIEGO, CA 92111
(619) 233-9373

DWG: 160605-DD DATE: DECEMBER 5, 2016 BY: JAB

FIGURE 4

EXISTING TRAFFIC VOLUMES

EXISTING LEVEL OF SERVICE CONDITIONS

Roadway Segments

Table 3 summarizes the LOS along the roadway segments in the study area. As shown in the table, all roadway segments operate at LOS A except for the Magic Mountain Parkway segment between I-5 northbound on/off ramp and Tourney Road, which operates at LOS "B".

Table 2 - Existing Roadway Segment Level of Service Summary

Roadway Segment	Classification	Existing Number of Lanes	LOS "E" Capacity	ADT	v/c	LOS
Magic Mountain Pkwy	Major Arterial	6-Lane Divided	54,000			
The Old Rd to I-5 SB Ramps				31,096	0.576	A
I-5 NB Ramps to Tourney Road				31,378	0.584	B
Tourney Road to Wayne Mills Place				31,542	0.580	A
Tourney Rd	Secondary Highway	4-Lane Undivided	24,000			
Magic Mountain Pkwy to Wayne Mills Place				9,892	0.412	A
South of Wayne Mills Place				5,801	0.242	A

Volume on this segment was estimated. Capacity is based on the upper limits of LOS E per the City of Santa Clarita General Plan Circulation Element; ADT= Average Daily Traffic; LOS= Level of Service.

Intersections

Table 4 summarizes the LOS at the intersections in the study area. As shown in the table, all signalized intersections operate at LOS "B" or better during the AM and PM peak periods. The unsignalized intersection of Tourney Road/Wayne Mills Place operates at LOS "B" or better during the AM and PM peak periods.

Table 3 - Existing Intersection Level of Service Summary

#	Intersection	Traffic Control	Peak Hour	Existing Conditions: Delay (a)	Existing Conditions: LOS (b)
1	I-5 SB Ramps & Magic Mountain Pkwy	Signal	AM	13.1	B
			PM	14.8	B
2	I-5 NB Ramps & Magic Mountain Pkwy	Signal	AM	18.9	B
			PM	19.3	B
3	Tourney Rd & Magic Mountain Pkwy	Signal	AM	19.0	B
			PM	19.6	B
4	Tourney Rd & Wayne Mills Pl	TWSC	AM	4.4	A
			PM	4.7	B
5	Project Dwy & Wayne Mills Pl	OWSC	AM	DNE	
			PM		

DNE: Does not exist

(a) HCM's's are reported at the signalized intersections. Delays are reported as the worst movement at unsignalized intersections.

(b) LOS calculations are based on the methodology outlined in the 2000 Highway Capacity Manual (HCM) and performed using Synchro 8, TWSC = Two Way Stop Control, OWSC = One Way Stop Control.

A copy of the analysis worksheets for conditions can be found in Appendix B.

SECTION III - PROJECT RELATED CONDITIONS

TRIP GENERATION

Trip generation rates published by the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition* were applied to the existing and proposed use in order to determine the traffic generation characteristics of the site. The existing site contains a 120 Room Best Western Hotel. The project consists of a 182 Room Springhill Suites/Residence Inn and a 108 Room Holiday Inn Express, which results in a net increase of 170 hotel rooms. Upon reviewing the various land uses contained in the *ITE Trip Generation Manual*, land use code of 312 (Business Hotel) was the most appropriate and applied to the project.

Table 4 summarizes the weekday trip generation. As shown in the table, the project is forecasted to generate a net increase of 1,237 daily trips with 99 AM peak-hour trips and 105 PM peak-hour trips.

Table 4 - Trip Generation Rates and Calculations Summary

Trip Generation Rates

Land Use	Daily	AM Peak Hour			PM Peak Hour		
		Rate	% In	% Out	Rate	% In	% Out
Business Hotel	7.27 trips/rooms	0.58/Room	59%	41%	0.62/Room	60%	40%

Trip Generation

Land Use	Total No. of Units	Daily	AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out
Existing Uses								
Best Western	120 rooms	873	70	42	28	75	45	30
Proposed Uses								
Springhill Suites/Residence Inn	182 rooms	1,324	106	63	43	113	68	45
Holiday Inn Express	108 rooms	786	63	38	25	67	41	26
Subtotal (Proposed – Existing)		**2,110**	**169**	**101**	**68**	**180**	**109**	**71**
Net New Trips		**1,237**	**99**	**59**	**40**	**105**	**64**	**41**

Trip Generation Rates are based on rates published by the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition.*

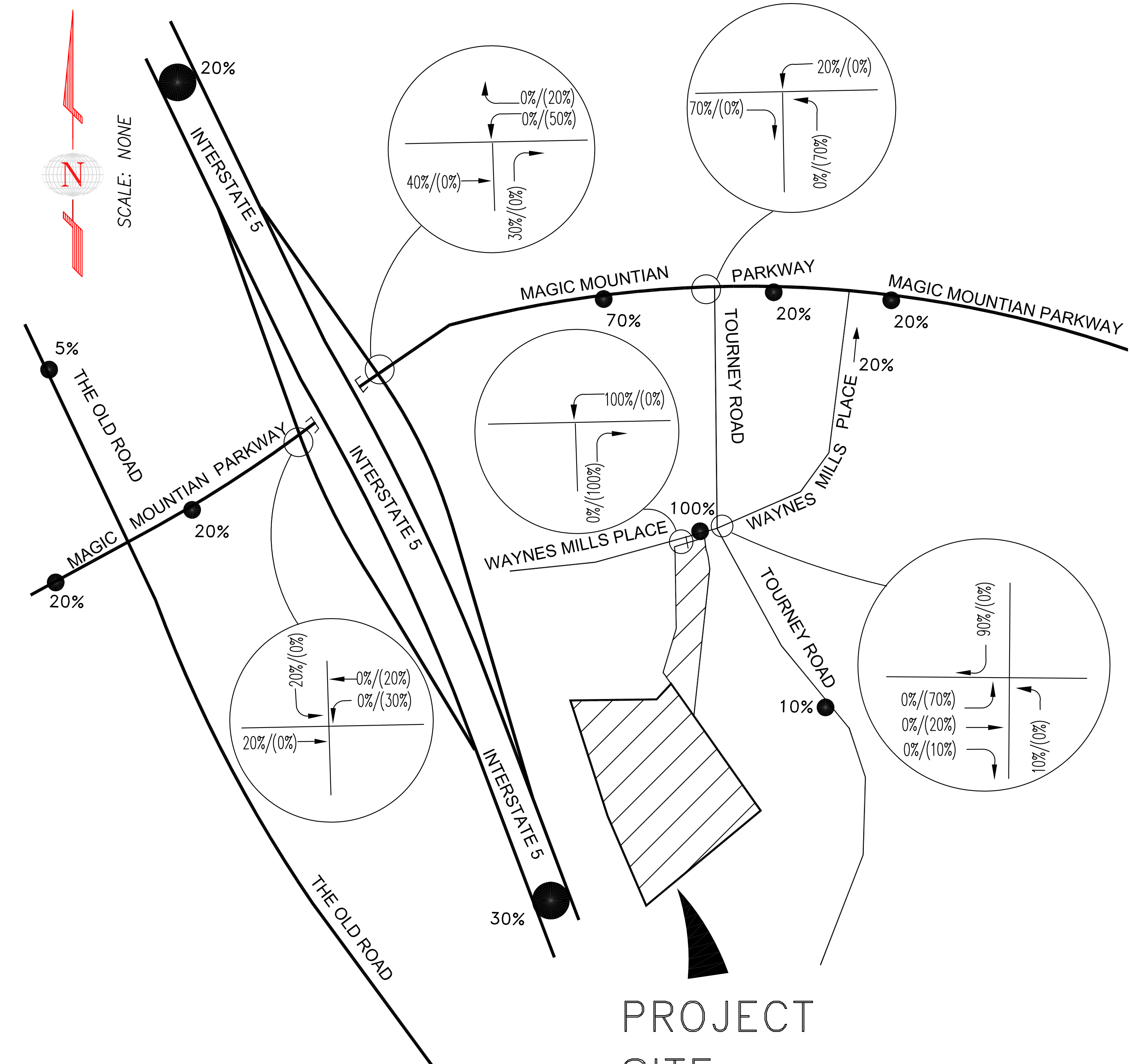
TRIP DISTRIBUTION/TRIP ASSIGNMENT

Based on existing travel patterns in the study area and on logical connections to regional facilities, the following list shows the assumed project trip distribution for the proposed project:

- 20 percent to/from the north via I-5;
- 40 percent to/from the south;
    - 30 percent via I-5;
    - 10 percent via Tourney Road;
- 20 percent to/from the east via Magic Mountain Parkway; and
- 20 percent to/from the west via Magic Mountain Parkway.

Figure 5 displays the assumed project trip distribution through the study intersections. Based on the project trip generation and distribution, the peak-hour trips were assigned to the intersections in the study area. Figure 6 illustrates the weekday project trip assignment.

The impacts associated with the addition of project traffic are discussed in the following section, Section IV.



LEGEND

→ – DIRECTION OF TRAVEL

XX% – TRIP DISTRIBUTION PERCENTAGE

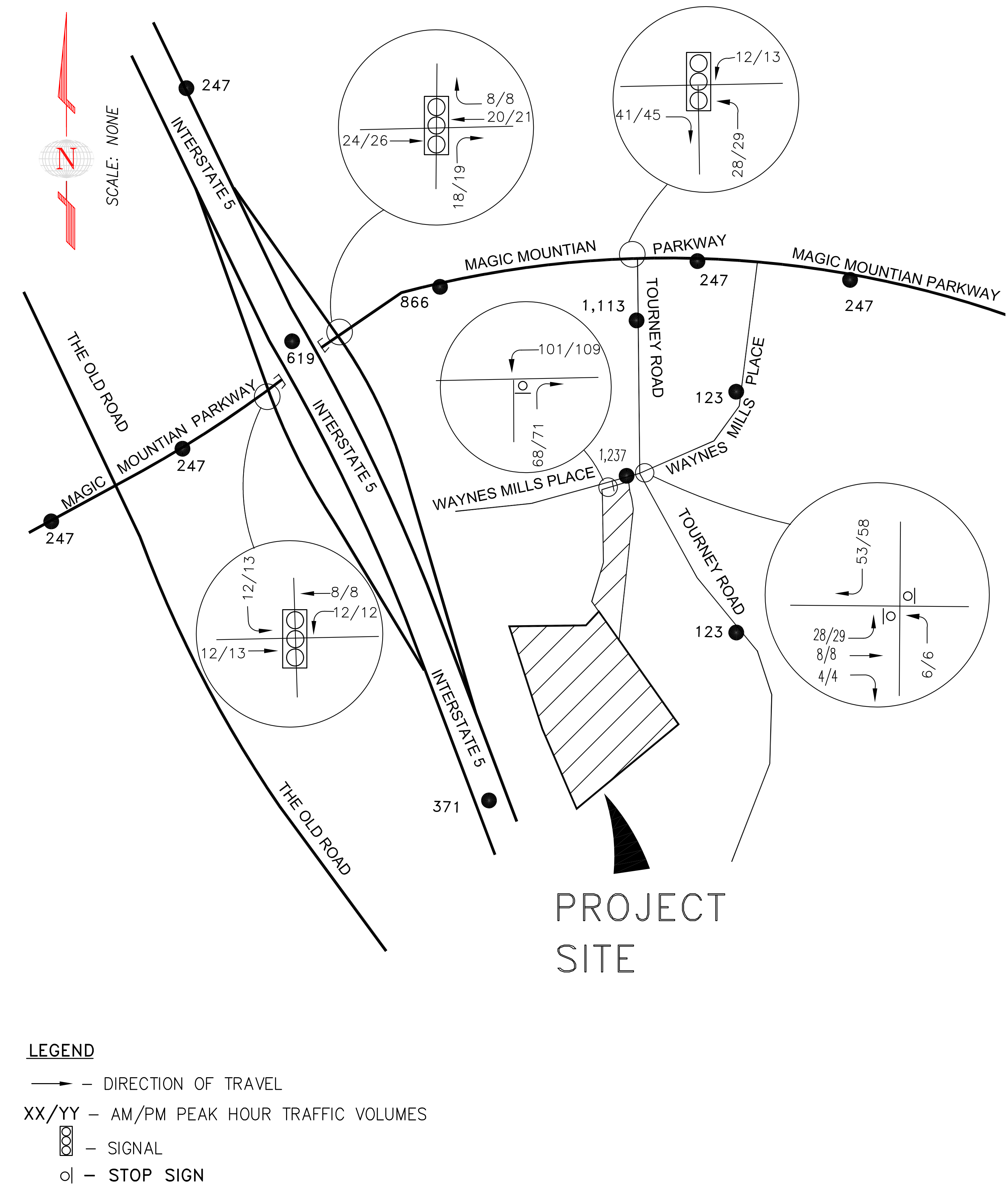
REGISTERED PROFESSIONAL ENGINEER
BILL E. DARNELL
No. 22338
Exp. 9-30-17
CIVIL
STATE OF CALIFORNIA

Darnell & ASSOCIATES, INC.
2870 MERCURY STREET, SUITE 207A
SAN DIEGO, CA 92111
(619) 233-9373

DWG: 160605-DD DATE: DECEMBER 5, 2016 BY: JAB

FIGURE 5

PROJECT TRIP DISTRIBUTION



REGISTERED PROFESSIONAL ENGINEER
BILL E. DARNELL
No. 22338
Exp. 9-30-17
CIVIL
STATE OF CALIFORNIA

Darnell & ASSOCIATES, INC.
2870 MERCURY STREET, SUITE 207A
SAN DIEGO, CA 92111
(619) 233-9373
DWG: 160605-DD DATE: DECEMBER 5, 2016 BY: JAB

FIGURE 6
PROJECT TRAFFIC

SECTION IV – IMPACTS

This section describes the Level of Service analyses for the study area intersections and roadway segments with the addition of project traffic to Existing Conditions.

EXISTING PLUS PROJECT CONDITIONS

The daily and peak hour turn volumes for existing plus project conditions are illustrated in Figure 7.

Roadway Segments

The roadway segments were then analyzed with the traffic generated from the proposed project added to existing traffic volumes. Table 5 displays the Level of Service Analysis results for the roadway segments under the Existing Plus Project scenario. As shown in the table, all roadway segments are expected to operate at LOS "C" or better with the addition of the project.

Intersections

The intersections were then analyzed with the traffic generated from the proposed project added to existing traffic volumes. Table 6 displays the Level of Service Analysis results for the study intersections under the Existing Plus Project scenario. As shown in the table, all signalized intersections, are expected to operate at LOS "C" or better with the addition of the project traffic. The unsignalized intersections and the Project Driveway on Wayne Mills Place will operate at LOS "A" and the Tourney Road/Wayne Milles Place intersection will operate at LOS "B or better". The increase in delay does not exceed the significance thresholds.

2018 OPENING DAY PLUS PROJECT CONDITIONS

Opening Day 2018 traffic conditions are estimated by adding 3% per year (6% total) ambient growth to existing traffic volumes plus project traffic. Figure 8 presents the 2018 Opening Day volumes and Figure 9 presents the 2018 Opening Day plus project conditions.

Roadway Segments

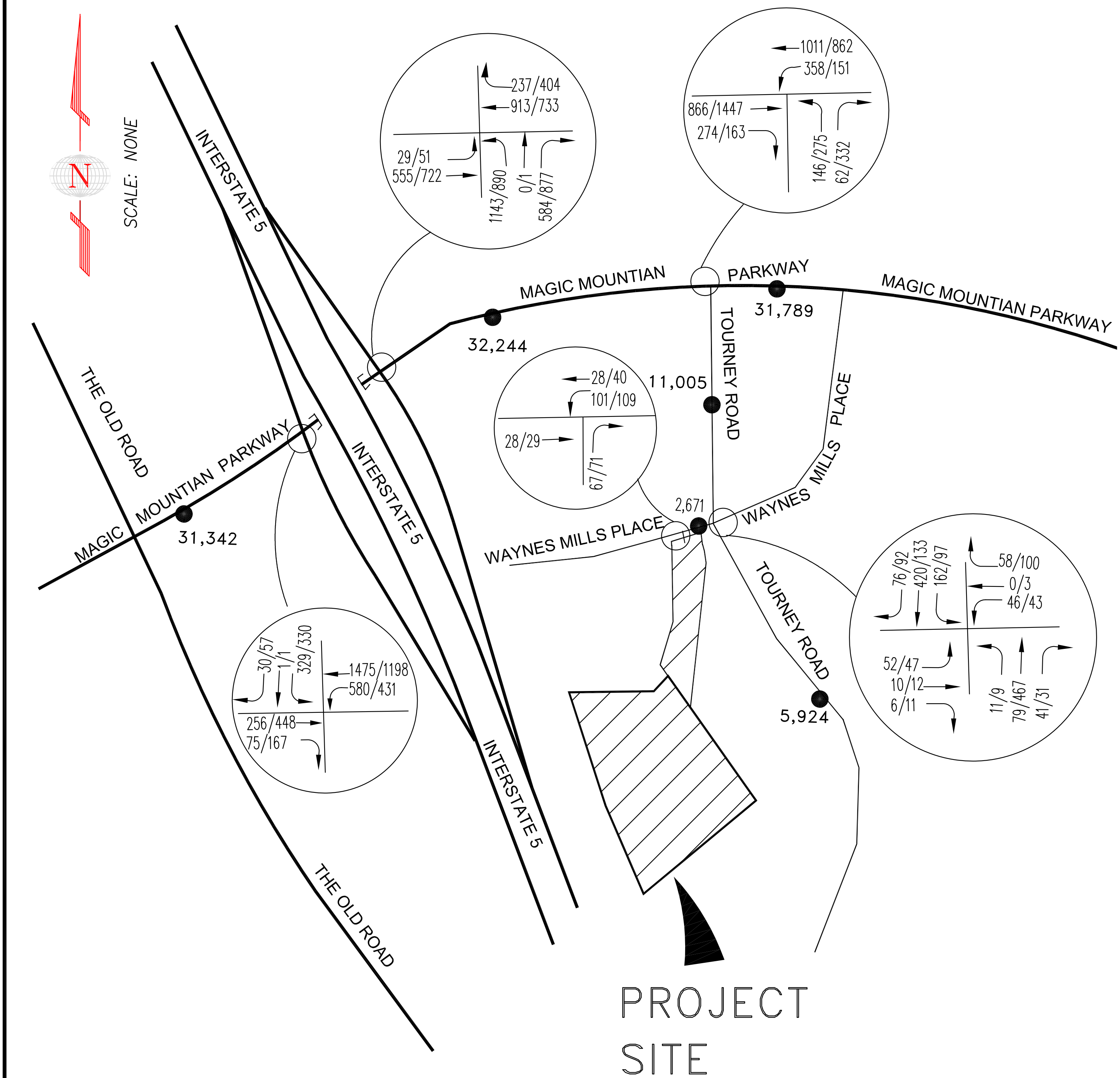
The roadway segments were analyzed with the traffic generated from the proposed project added to existing traffic volumes plus 3% ambient growth. Table 7 displays the Level of Service Analysis results for the roadway segments under the Existing Plus Project scenario. As shown in the table, all roadway segments are expected to operate at LOS "B" or better with the addition of the project.

Intersections

The intersections were analyzed with the traffic generated from the proposed project added to existing traffic volumes plus the addition of 3% ambient growth. Table 8 displays the Level of Service Analysis results for the study intersections under the Existing Plus Project scenario. As shown in Table 8, all intersections, including the project driveway, are expected to operate at LOS "C" or better with the addition of the project traffic. Therefore no mitigation is required.

MITIGATION

The project does not create any direct impacts that require mitigation.



LEGEND

—— DIRECTION OF TRAVEL

XX/YY – AM/PM PEAK HOUR TRAFFIC VOLUMES

– SIGNAL

o| – STOP SIGN

REGISTERED PROFESSIONAL ENGINEER
BILL E. DARNELL
No. 22338
Exp. 9-30-17
CIVIL
STATE OF CALIFORNIA

Darnell & ASSOCIATES, INC.
2870 MERCURY STREET, SUITE 207A
SAN DIEGO, CA 92111
(619) 233-9373

DWG: 160605-DD DATE: DECEMBER 5, 2016 BY: JAB

FIGURE 7
EXISTING PLUS PROJECT TRAFFIC VOLUMES

Table 5 - Existing Plus Project Roadway Segment Level of Service Summary

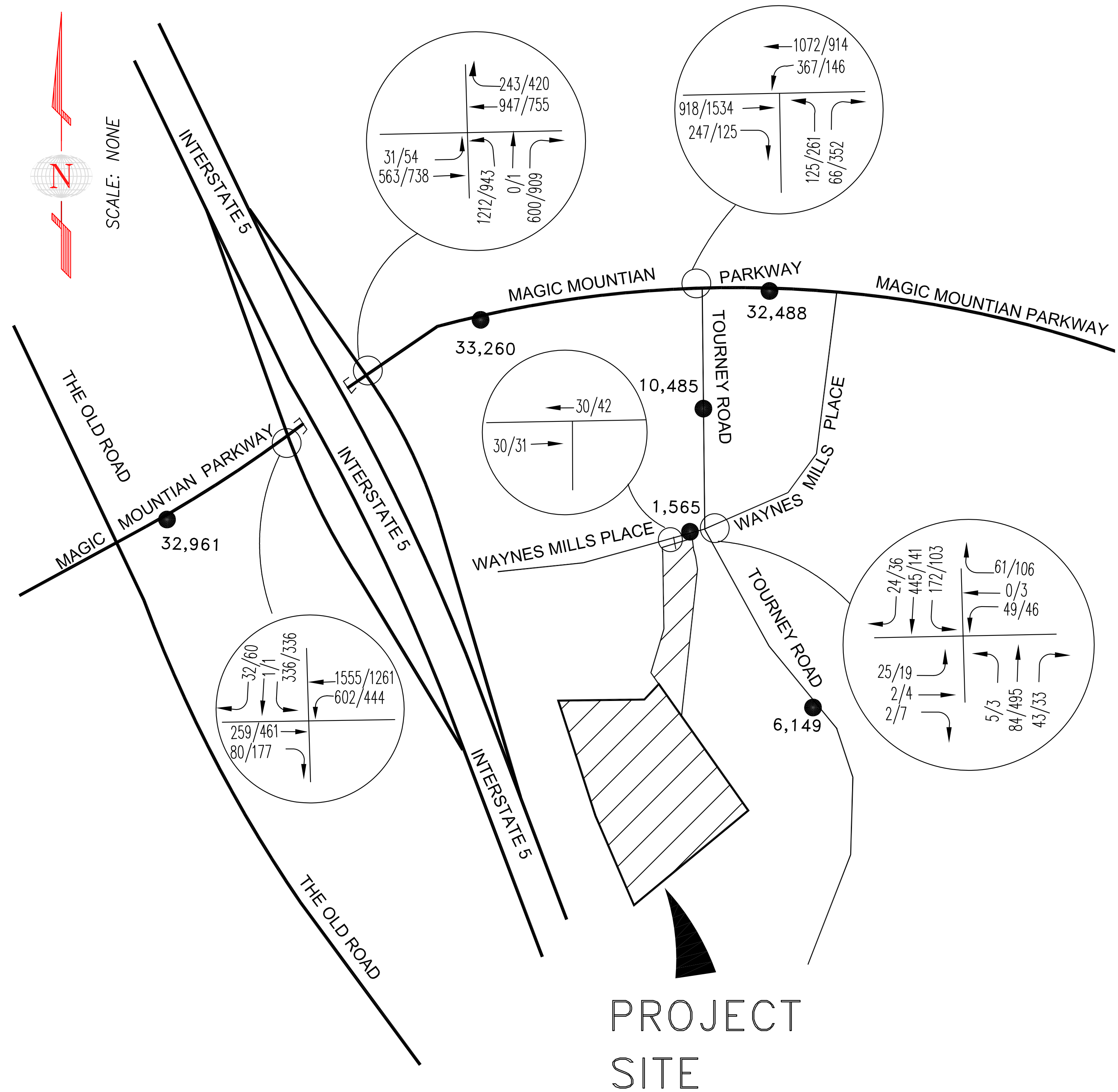
Roadway Segment	Classification	Existing Number of Lanes	LOS "E" Capacity	Existing			Proj. ADT	Existing Plus Project			Δ in v/c
				ADT	v/c	LOS			v/c	LOS	
Magic Mountain Pkwy											
The Old Rd to I-5 SB Ramps	Major Arterial	6-Lane Divided	54,000	31,096	0.576	A	247	31,347	0.580	B	0.004
I-5 NB Ramps to Tourney Road				31,378	0.584	B	866	32,244	0.597	B	0.016
Tourney Road to Wayne Mills Place				31,542	0.580	A	247	31,789	0.592	B	0.002
Tourney Road											
Magic Mountain Pkwy to Wayne Mills Place	Secondary Highway	4-Lane Undivided	24,000	9,892	0.412	A	1,113	11,005	0.459	A	0.047
South of Wayne Mills Place				5,801	0.242	A	123	5,924	0.247	A	0.005
Wayne Mills Place											
West of Tourney Road	Local	2-Lane	5,000	1,434	0.286	A	1,236	2,671	0.534	C	0.248

Volume on this segment was estimated. Capacity is based on the upper limits of LOS E per the City of Santa Clarita General Plan Circulation Element; ADT= Average Daily Traffic; LOS= Level of Service., Proj. ADT = Project Average Daily Traffic,

Table 6 - Existing Plus Project Intersection Level of Service Summary

#	Intersection	Traffic Control	Peak Hour	Existing Conditions		Existing Plus Project		Δ in Delay	Sign.(c)
				Delay (a)	LOS (b)	Delay (a)	LOS (b)		
1	I-5 SB Ramps & Magic Mountain Pkwy	Signal	AM	13.1	B	13.3	B	0.200	No
			PM	14.8	B	15.2	B	0.400	No
2	I-5 NB Ramps & Magic Mountain Pkwy	Signal	AM	18.9	B	19.2	B	0.300	No
			PM	19.3	B	19.5	B	0.200	No
3	Tourney Road & Magic Mountain Pkwy	Signal	AM	19.0	B	20.1	C	1.1	No
			PM	19.6	B	20.9	C	1.3	No
4	Tourney Road & Wayne Mills Place	TWSC	AM	4.4	A	5.6	A	1.2	No
			PM	4.7	B	5.9	B	1.2	No
5	Project Driveway & Wayne Mills Place	OWSC	AM	DNE		6.0	B	6.0	No
			PM			5.8	B	5.8	No

Notes:
DNE = Does not exist, TWSC = Two Way Stop Control, OWSC = One Way Stop Control.
a. HCM is reported at signalized intersections. Sign. = Significance.
b. LOS calculations are based on the methodology outlined in the *2010 Highway Capacity Manual* (HCM).
Delays at unsignalized intersections are reported based on intersection delay using Synchro 8 – Intersection Capacity Software
c. Project Impacts are considered significant if the Intersection LOS degrades from LOS "D" of better to LOS "E" of LOS "F"



LEGEND

→ – DIRECTION OF TRAVEL

XX/YY – AM/PM PEAK HOUR TRAFFIC VOLUMES

– SIGNAL

o| – STOP SIGN

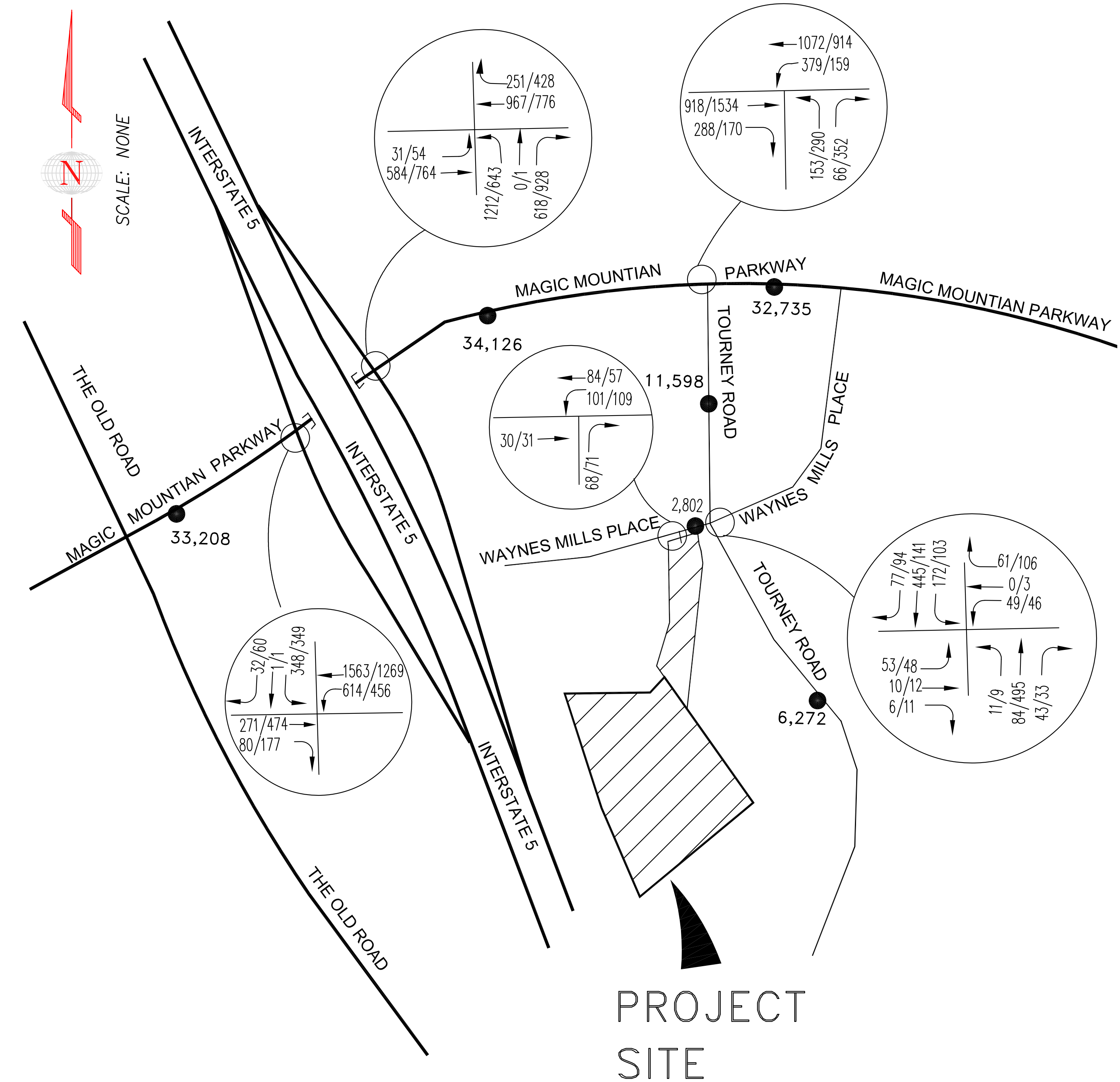
BILL E. DARNELL
No. 22338
Exp. 9-30-17
CIVIL
REGISTERED PROFESSIONAL ENGINEER
STATE OF CALIFORNIA

Darnell & ASSOCIATES, INC.
2870 MERCURY STREET, SUITE 207A
SAN DIEGO, CA 92111
(619) 233-9373

DWG: 160605-DD DATE: DECEMBER 5, 2016 BY: JAB

FIGURE 8

2018 OPENING DAY TRAFFIC VOLUMES



LEGEND

→ – DIRECTION OF TRAVEL

XX/YY – AM/PM PEAK HOUR TRAFFIC VOLUMES

– SIGNAL

o| – STOP SIGN

REGISTERED PROFESSIONAL ENGINEER
BILL E. DARNELL
No. 22338
Exp. 9-30-17
CIVIL
STATE OF CALIFORNIA

Darnell & ASSOCIATES, INC.
2870 MERCURY STREET, SUITE 207A
SAN DIEGO, CA 92111
(619) 233-9373
DWG: 160605-DD DATE: DECEMBER 5, 2016 BY: JAB

FIGURE 9

2018 OPENING DAY PLUS PROJECT TRAFFIC VOLUMES

Table 7 –Existing Plus Project Plus 2018 Opening Day Roadway Segment Level of Service Summary

Roadway Segment	Classification	Existing Number of Lanes	LOS "E" Capacity	Existing Plus Ambient			Existing Plus Project Plus Ambient Growth				Sign. (a)
				ADT	v/c	LOS	ADT	v/c	LOS	Δ v/c	
Magic Mountain Pkwy											
The Old Rd to I-5 SB Ramps	Major Arterial	6-Lane Divided	54,000	32,961	0.610	B	33,208	0.615	B	0.005	No
I-5 NB Ramps to Tourney Road				33,260	0.616	B	34,126	0.632	B	0.018	No
Tourney Road to Wayne Mills Place				31,542	0.584	B	32,488	0.602	B	0.018	No
Tourney Road											
Magic Mountain Pkwy to Wayne Mills Place	Secondary Highway	4-Lane Undivided	24,000	10,485	0.437	A	11,598	0.483	A	0.046	No
South of Wayne Mills Place				6,149	0.256	A	6,272	0.261	A	0.005	No
Wayne Mills Place											
West of Tourney Road	Local	2-Lane	5,000	1,565	0.313	A	2,802	0.560	A	0.247	NO

Volume on this segment was estimated. Capacity is based on the upper limits of LOS E per the City of Santa Clarita General Plan Circulation Element; ADT= Average Daily Traffic; LOS= Level of Service, Sign. = Significance. (a) Project Impacts are considered significant if the Intersection LOS degrades from LOS "D" of better to LOS "E" of LOS "F" and increases the v/c 0.2 or greater.

Table 8 - Existing Plus Project Plus 2018 Opening Day Intersection Level of Service Summary

#	Intersection	Traffic Control	Peak Hour	Existing Plus 2018 Ambient Growth Conditions		Existing Plus Project Plus 2018 Ambient Growth Conditions		Δ in Delay	Significant (c)
				Delay (a)	LOS (b)	Delay (a)	LOS (b)		
1	I-5 SB Ramps & Magic Mountain Pkwy	Signal	AM	13.7	B	14.1	B	0.4	No
			PM	15.5	B	15.9	B	0.4	No
2	I-5 NB Ramps & Magic Mountain Pkwy	Signal	AM	19.5	B	19.7	B	0.2	No
			PM	19.6	B	19.8	B	0.2	No
3	Tourney Road & Magic Mountain Pkwy	Signal	AM	19.9	B	20.7	C	0.8	No
			PM	21.1	C	22.4	C	1.3	No
4	Tourney Road & Wayne Mills Place	TWSC	AM	4.7	A	6.1	A	1.4	No
			PM	5.2	B	6.6	B	1.4	No
5	Project Driveway & Wayne Mills Place	OWSC	AM	DNE		5.9	A	5.9	No
			PM			5.7	A	5.7	No

Notes:
DNE = Does not exist, TWSC = Two Way Stop Control, OWSC = One Way Stop Control.
(a) HCM is reported at signalized intersections.
(b) LOS calculations are based on the methodology outlined in the *2000 Highway Capacity Manual* (HCM).
Delays at unsignalized intersections are reported based on intersection delay using Synchro 8 – Intersection Capacity Software
(c) . Project Impacts are considered significant if the Intersection LOS degrades from LOS "D" of better to LOS "E" of LOS "F"

SECTION V - SUMMARY OF FINDINGS AND CONCLUSIONS

The following list provides a summary of the key findings for the project:

- The project is forecasted to generate a net increase of approximately 1,237 daily trips with 99 AM peak-hour trips and 105 PM peak-hour trips.

- All study area roadway segments are expected to operate at an acceptable LOS "C" or better for Existing, 2018 Opening Day and 2018 Opening Day Plus Project Conditions.

- The addition of project traffic to the 2018 Opening Day Conditions does not result in a significant impact on the roadway segments analyzed. Therefore no mitigation is required.

- All study area intersections, including the project driveway, are expected to operate at an acceptable LOS "C" or better during the AM and PM peak hours with the addition of project traffic to 2018 Opening Day Conditions.

- The addition of project traffic to the 2018 Opening Day Conditions does not result in a significant impact on the intersections analyzed. Therefore no mitigation is required.

APPENDIX A

- 24-Hour Segment Counts
- AM/PM Peak Hour Turn Counts
- City of Santa Clarita Traffic Guidelines

- 24-Hour Segment Counts

Prepared by NDS/ATD

VOLUME

Wayne Mills Pl E/O Driveway #3

Day: Monday
Date: 7/4/2016

City: Santa Clarita
Project #: CA16_5446_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	734	700	1,434

AM Period	NB	SB	EB		WB		TOTAL	
00:00			7		15		22	
00:15			9		10		19	
00:30			5		5		10	
00:45			3	24	3	33	6	57
01:00			10		3		13	
01:15			2		5		7	
01:30			5		5		10	
01:45			4	21	1	14	5	35
02:00			5		2		7	
02:15			0		1		1	
02:30			1		1		2	
02:45			0	6	1	5	1	11
03:00			1		2		3	
03:15			2		0		2	
03:30			1		1		2	
03:45			0	4	0	3	0	7
04:00			4		0		4	
04:15			0		0		0	
04:30			1		1		2	
04:45			0	5	5	6	5	11
05:00			2		2		4	
05:15			2		5		7	
05:30			3		2		5	
05:45			3	10	4	13	7	23
06:00			4		3		7	
06:15			6		4		10	
06:30			4		6		10	
06:45			3	17	7	20	10	37
07:00			7		2		9	
07:15			2		12		14	
07:30			7		10		17	
07:45			8	24	17	41	25	65
08:00			9		3		12	
08:15			4		9		13	
08:30			11		8		19	
08:45			9	33	8	28	17	61
09:00			19		16		35	
09:15			17		8		25	
09:30			21		15		36	
09:45			23	80	17	56	40	136
10:00			27		10		37	
10:15			26		10		36	
10:30			22		13		35	
10:45			21	96	11	44	32	140
11:00			20		12		32	
11:15			15		7		22	
11:30			23		5		28	
11:45			11	69	8	32	19	101
TOTALS			389		295		684	
SPLIT %			56.9%		43.1%		47.7%	

PM Period	NB	SB	EB		WB		TOTAL	
12:00			13		6		19	
12:15			11		11		22	
12:30			11		9		20	
12:45			12	47	10	36	22	83
13:00			13		5		18	
13:15			8		8		16	
13:30			6		1		7	
13:45			8	35	5	19	13	54
14:00			12		10		22	
14:15			8		3		11	
14:30			7		5		12	
14:45			4	31	13	31	17	62
15:00			6		4		10	
15:15			4		3		7	
15:30			6		13		19	
15:45			8	24	6	26	14	50
16:00			9		8		17	
16:15			10		10		20	
16:30			7		4		11	
16:45			9	35	6	28	15	63
17:00			5		6		11	
17:15			2		10		12	
17:30			6		9		15	
17:45			4	17	4	29	8	46
18:00			5		2		7	
18:15			7		9		16	
18:30			10		14		24	
18:45			2	24	9	34	11	58
19:00			6		8		14	
19:15			10		3		13	
19:30			4		4		8	
19:45			7	27	7	22	14	49
20:00			3		8		11	
20:15			7		13		20	
20:30			8		10		18	
20:45			2	20	9	40	11	60
21:00			11		15		26	
21:15			8		7		15	
21:30			3		9		12	
21:45			7	29	11	42	18	71
22:00			7		13		20	
22:15			6		17		23	
22:30			4		14		18	
22:45			9	26	20	64	29	90
23:00			8		9		17	
23:15			7		9		16	
23:30			10		8		18	
23:45			5	30	8	34	13	64
TOTALS			345		405		750	
SPLIT %			46.0%		54.0%		52.3%	

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	734	700	1,434

	EB	WB	TOTAL		EB	WB	TOTAL
AM Peak Hour	09:45	09:00	09:30	PM Peak Hour	12:00	22:00	22:00
AM Pk Volume	98	56	149	PM Pk Volume	47	64	90
Pk Hr Factor	0.907	0.824	0.931	Pk Hr Factor	0.904	0.800	0.776
7 - 9 Volume	57	69	126	4 - 6 Volume	52	57	109
7 - 9 Peak Hour	08:00	07:15	07:45	4 - 6 Peak Hour	16:00	16:45	16:00
7 - 9 Pk Volume	33	42	69	4 - 6 Pk Volume	35	31	63
Pk Hr Factor	0.750	0.618	0.690	Pk Hr Factor	0.875	0.775	0.788

Prepared by NDS/ATD

VOLUME

Tourney Rd Bet. Magic Mountain Pkwy & Wayne Mills Pl

Day: Thursday
Date: 7/28/2016

City: Santa Clarita
Project #: CA16_5500_001

DAILY TOTALS	NB	SB	EB	WB	Total
	5,001	5,229	0	0	10,230

AM Period	NB		SB		EB	WB	TOTAL	
00:00	13		7				20	
00:15	9		5				14	
00:30	3		5				8	
00:45	6	31	5	22			11	53
01:00	4		4				8	
01:15	5		5				10	
01:30	4		3				7	
01:45	1	14	1	13			2	27
02:00	6		3				9	
02:15	2		11				13	
02:30	2		5				7	
02:45	2	12	2	21			4	33
03:00	5		1				6	
03:15	3		0				3	
03:30	8		4				12	
03:45	3	19	4	9			7	28
04:00	0		3				3	
04:15	3		6				9	
04:30	8		6				14	
04:45	7	18	11	26			18	44
05:00	11		13				24	
05:15	25		23				48	
05:30	23		15				38	
05:45	24	83	17	68			41	151
06:00	29		24				53	
06:15	21		40				61	
06:30	43		34				77	
06:45	31	124	77	175			108	299
07:00	33		55				88	
07:15	39		97				136	
07:30	38		118				156	
07:45	40	150	155	425			195	575
08:00	38		153				191	
08:15	55		177				232	
08:30	41		138				179	
08:45	48	182	145	613			193	795
09:00	70		116				186	
09:15	82		88				170	
09:30	85		99				184	
09:45	75	312	102	405			177	717
10:00	86		120				206	
10:15	82		99				181	
10:30	102		72				174	
10:45	72	342	99	390			171	732
11:00	101		84				185	
11:15	86		91				177	
11:30	125		91				216	
11:45	110	422	89	355			199	777
TOTALS		1709		2522				4231
SPLIT %		40.4%		59.6%				41.4%

PM Period	NB		SB		EB	WB	TOTAL	
12:00	137		76				213	
12:15	132		90				222	
12:30	104		96				200	
12:45	116	489	115	377			231	866
13:00	78		135				213	
13:15	85		109				194	
13:30	84		99				183	
13:45	91	338	116	459			207	797
14:00	78		76				154	
14:15	78		88				166	
14:30	78		102				180	
14:45	91	325	100	366			191	691
15:00	91		85				176	
15:15	81		87				168	
15:30	101		69				170	
15:45	83	356	71	312			154	668
16:00	105		85				190	
16:15	101		78				179	
16:30	137		60				197	
16:45	136	479	73	296			209	775
17:00	182		66				248	
17:15	95		69				164	
17:30	127		55				182	
17:45	94	498	46	236			140	734
18:00	95		51				146	
18:15	57		60				117	
18:30	63		48				111	
18:45	61	276	38	197			99	473
19:00	40		34				74	
19:15	41		33				74	
19:30	45		34				79	
19:45	37	163	30	131			67	294
20:00	41		31				72	
20:15	36		35				71	
20:30	39		29				68	
20:45	21	137	24	119			45	256
21:00	50		33				83	
21:15	20		16				36	
21:30	25		30				55	
21:45	27	122	30	109			57	231
22:00	22		18				40	
22:15	16		23				39	
22:30	14		11				25	
22:45	9	61	10	62			19	123
23:00	15		13				28	
23:15	13		6				19	
23:30	11		9				20	
23:45	9	48	15	43			24	91
TOTALS		3292		2707				5999
SPLIT %		54.9%		45.1%				58.6%

DAILY TOTALS	NB	SB	EB	WB	Total
	5,001	5,229	0	0	10,230

	NB	SB	EB	WB	TOTAL
AM Peak Hour	11:30	07:45			11:30
AM Pk Volume	504	623			850
Pk Hr Factor	0.920	0.880			0.957
7 - 9 Volume	332	1038	0	0	1370
7 - 9 Peak Hour	08:00	07:45			07:45
7 - 9 Pk Volume	182	623	0	0	797
Pk Hr Factor	0.827	0.880	0.000	0.000	0.859

	NB	SB	EB	WB	TOTAL
PM Peak Hour	16:15	13:00			12:00
PM Pk Volume	556	459			866
Pk Hr Factor	0.764	0.850			0.937
4 - 6 Volume	977	532	0	0	1509
4 - 6 Peak Hour	16:15	16:00			16:15
4 - 6 Pk Volume	556	296	0	0	833
Pk Hr Factor	0.764	0.871	0.000	0.000	0.840

Prepared by NDS/ATD

VOLUME

Tourney Rd S/O Wayne Mills Pl

Day: Thursday
Date: 7/28/2016

City: Santa Clarita
Project #: CA16_5500_002

DAILY TOTALS	NB	SB	EB	WB	Total
	2,940	3,059	0	0	5,999

AM Period	NB		SB		EB	WB	TOTAL	
00:00	12		6				18	
00:15	4		8				12	
00:30	10		5				15	
00:45	6	32	3	22			9	54
01:00	3		6				9	
01:15	3		3				6	
01:30	4		6				10	
01:45	5	15	4	19			9	34
02:00	7		8				15	
02:15	8		4				12	
02:30	5		2				7	
02:45	5	25	3	17			8	42
03:00	5		2				7	
03:15	1		6				7	
03:30	5		8				13	
03:45	5	16	3	19			8	35
04:00	8		7				15	
04:15	9		13				22	
04:30	13		4				17	
04:45	16	46	8	32			24	78
05:00	14		10				24	
05:15	21		13				34	
05:30	26		9				35	
05:45	19	80	25	57			44	137
06:00	27		21				48	
06:15	29		26				55	
06:30	29		26				55	
06:45	25	110	39	112			64	222
07:00	31		25				56	
07:15	30		45				75	
07:30	42		44				86	
07:45	32	135	25	139			57	274
08:00	35		36				71	
08:15	28		24				52	
08:30	32		31				63	
08:45	35	130	23	114			58	244
09:00	30		36				66	
09:15	38		33				71	
09:30	35		37				72	
09:45	45	148	34	140			79	288
10:00	22		48				70	
10:15	34		34				68	
10:30	40		40				80	
10:45	42	138	40	162			82	300
11:00	43		39				82	
11:15	35		38				73	
11:30	34		58				92	
11:45	48	160	57	192			105	352
TOTALS	1035		1025				2060	
SPLIT %	50.2%		49.8%				34.3%	

PM Period	NB		SB		EB	WB	TOTAL	
12:00	42		53				95	
12:15	47		53				100	
12:30	42		56				98	
12:45	33	164	49	211			82	375
13:00	49		48				97	
13:15	40		65				105	
13:30	50		58				108	
13:45	48	187	37	208			85	395
14:00	44		42				86	
14:15	30		43				73	
14:30	50		45				95	
14:45	46	170	40	170			86	340
15:00	43		53				96	
15:15	45		51				96	
15:30	41		34				75	
15:45	45	174	47	185			92	359
16:00	41		39				80	
16:15	45		41				86	
16:30	50		40				90	
16:45	49	185	54	174			103	359
17:00	54		43				97	
17:15	50		61				111	
17:30	65		55				120	
17:45	51	220	72	231			123	451
18:00	67		41				108	
18:15	51		44				95	
18:30	50		45				95	
18:45	50	218	37	167			87	385
19:00	45		53				98	
19:15	43		45				88	
19:30	33		52				85	
19:45	36	157	54	204			90	361
20:00	41		48				89	
20:15	37		49				86	
20:30	48		46				94	
20:45	36	162	57	200			93	362
21:00	40		38				78	
21:15	42		36				78	
21:30	30		29				59	
21:45	26	138	27	130			53	268
22:00	21		27				48	
22:15	22		21				43	
22:30	16		12				28	
22:45	15	74	23	83			38	157
23:00	17		26				43	
23:15	17		11				28	
23:30	14		22				36	
23:45	8	56	12	71			20	127
TOTALS	1905		2034				3939	
SPLIT %	48.4%		51.6%				65.7%	

DAILY TOTALS	NB	SB	EB	WB	Total
	2,940	3,059	0	0	5,999

	NB	SB	EB	WB	Total		NB	SB	EB	WB	Total
AM Peak Hour	11:45	11:30			11:45	PM Peak Hour	17:30	17:00			17:15
AM Pk Volume	179	221			398	PM Pk Volume	234	231			462
Pk Hr Factor	0.932	0.953			0.948	Pk Hr Factor	0.873	0.802			0.939
7 - 9 Volume	265	253	0	0	518	4 - 6 Volume	405	405	0	0	810
7 - 9 Peak Hour	07:15	07:15			07:15	4 - 6 Peak Hour	17:00	17:00			17:00
7 - 9 Pk Volume	139	150	0	0	289	4 - 6 Pk Volume	220	231	0	0	451
Pk Hr Factor	0.827	0.833	0.000	0.000	0.840	Pk Hr Factor	0.846	0.802	0.000	0.000	0.917

Prepared by NDS/ATD

VOLUME

Magic Mountain Pkwy Bet. I-5 NB Ramps & Tourney Rd

Day: Thursday
Date: 7/28/2016

City: Santa Clarita
Project #: CA16_5500_003

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	16,525	16,059	32,584

AM Period	NB	SB	EB	EB Hour	WB	WB Hour	TOTAL	TOTAL Hour	PM Period	NB	SB	EB	EB Hour	WB	WB Hour	TOTAL	TOTAL Hour
00:00			50		34		84		12:00			263		227		490	
00:15			34		28		62		12:15			248		293		541	
00:30			25		36		61		12:30			261		282		543	
00:45			19	128	20	118	39	246	12:45			240	1012	249	1051	489	2063
01:00			29		21		50		13:00			265		286		551	
01:15			28		14		42		13:15			249		273		522	
01:30			22		12		34		13:30			213		245		458	
01:45			17	96	12	59	29	155	13:45			200	927	238	1042	438	1969
02:00			30		13		43		14:00			206		247		453	
02:15			22		7		29		14:15			224		213		437	
02:30			8		18		26		14:30			246		241		487	
02:45			8	68	14	52	22	120	14:45			229	905	247	948	476	1853
03:00			10		6		16		15:00			240		258		498	
03:15			13		7		20		15:15			293		268		561	
03:30			23		19		42		15:30			306		243		549	
03:45			28	74	18	50	46	124	15:45			353	1192	253	1022	606	2214
04:00			19		21		40		16:00			373		245		618	
04:15			25		28		53		16:15			358		272		630	
04:30			52		54		106		16:30			391		248		639	
04:45			68	164	60	163	128	327	16:45			392	1514	290	1055	682	2569
05:00			57		94		151		17:00			402		276		678	
05:15			63		135		198		17:15			433		268		701	
05:30			67		147		214		17:30			366		223		589	
05:45			72	259	193	569	265	828	17:45			405	1606	249	1016	654	2622
06:00			91		180		271		18:00			288		248		536	
06:15			87		169		256		18:15			277		215		492	
06:30			133		220		353		18:30			244		177		421	
06:45			177	488	237	806	414	1294	18:45			218	1027	195	835	413	1862
07:00			155		184		339		19:00			222		174		396	
07:15			177		250		427		19:15			203		163		366	
07:30			233		247		480		19:30			177		170		347	
07:45			285	850	279	960	564	1810	19:45			189	791	174	681	363	1472
08:00			270		257		527		20:00			181		136		317	
08:15			248		253		501		20:15			150		152		302	
08:30			227		233		460		20:30			138		165		303	
08:45			240	985	243	986	483	1971	20:45			127	596	153	606	280	1202
09:00			236		247		483		21:00			141		173		314	
09:15			206		245		451		21:15			135		164		299	
09:30			228		235		463		21:30			161		144		305	
09:45			257	927	217	944	474	1871	21:45			138	575	124	605	262	1180
10:00			208		239		447		22:00			97		110		207	
10:15			243		246		489		22:15			96		96		192	
10:30			208		229		437		22:30			78		82		160	
10:45			200	859	213	927	413	1786	22:45			63	334	63	351	126	685
11:00			243		244		487		23:00			61		66		127	
11:15			211		252		463		23:15			54		52		106	
11:30			236		292		528		23:30			50		45		95	
11:45			234	924	238	1026	472	1950	23:45			59	224	24	187	83	411
TOTALS				5822		6660		12482	TOTALS				10703		9399		20102
SPLIT %				46.6%		53.4%		38.3%	SPLIT %				53.2%		46.8%		61.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	16,525	16,059	32,584

	NB	SB	EB	WB	TOTAL		NB	SB	EB	WB	TOTAL
AM Peak Hour			07:30	11:30	07:30	PM Peak Hour			16:30	12:15	16:30
AM Pk Volume			1036	1050	2072	PM Pk Volume			1618	1110	2700
Pk Hr Factor			0.909	0.896	0.918	Pk Hr Factor			0.934	0.947	0.963
7 - 9 Volume	0	0	1835	1946	3781	4 - 6 Volume	0	0	3120	2071	5191
7 - 9 Peak Hour			07:30	07:30	07:30	4 - 6 Peak Hour			16:30	16:15	16:30
7 - 9 Pk Volume	0	0	1036	1036	2072	4 - 6 Pk Volume	0	0	1618	1086	2700
Pk Hr Factor	0.000	0.000	0.909	0.928	0.918	Pk Hr Factor	0.000	0.000	0.934	0.936	0.963

Prepared by NDS/ATD

VOLUME

Magic Mountain Pkwy Bet. The Old Rd & I-5 SB Ramps

Day: Thursday
Date: 7/28/2016

City: Santa Clarita
Project #: CA16_5500_004

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	12,286	22,458	34,744

AM Period	NB	SB	EB		WB		TOTAL	
00:00			20		56		76	
00:15			16		30		46	
00:30			7		42		49	
00:45			19	62	24	152	43	214
01:00			19		20		39	
01:15			6		20		26	
01:30			14		26		40	
01:45			14	53	20	86	34	139
02:00			8		24		32	
02:15			13		22		35	
02:30			6		32		38	
02:45			10	37	29	107	39	144
03:00			9		10		19	
03:15			10		22		32	
03:30			5		36		41	
03:45			12	36	60	128	72	164
04:00			1		37		38	
04:15			5		50		55	
04:30			16		95		111	
04:45			8	30	118	300	126	330
05:00			12		103		115	
05:15			20		154		174	
05:30			16		254		270	
05:45			35	83	323	834	358	917
06:00			38		178		216	
06:15			36		217		253	
06:30			39		270		309	
06:45			32	145	359	1024	391	1169
07:00			52		297		349	
07:15			65		353		418	
07:30			71		314		385	
07:45			90	278	368	1332	458	1610
08:00			61		338		399	
08:15			81		292		373	
08:30			71		266		337	
08:45			75	288	292	1188	367	1476
09:00			89		357		446	
09:15			126		320		446	
09:30			126		389		515	
09:45			136	477	416	1482	552	1959
10:00			162		500		662	
10:15			129		504		633	
10:30			142		503		645	
10:45			167	600	511	2018	678	2618
11:00			119		486		605	
11:15			114		488		602	
11:30			155		432		587	
11:45			218	606	420	1826	638	2432
TOTALS			2695		10477		13172	
SPLIT %			20.5%		79.5%		37.9%	

PM Period	NB	SB	EB		WB		TOTAL	
12:00			227		393		620	
12:15			121		460		581	
12:30			117		415		532	
12:45			122	587	360	1628	482	2215
13:00			135		339		474	
13:15			111		323		434	
13:30			213		303		516	
13:45			121	580	208	1173	329	1753
14:00			189		275		464	
14:15			165		246		411	
14:30			185		259		444	
14:45			134	673	303	1083	437	1756
15:00			160		290		450	
15:15			218		335		553	
15:30			261		287		548	
15:45			256	895	329	1241	585	2136
16:00			241		312		553	
16:15			243		328		571	
16:30			266		312		578	
16:45			271	1021	359	1311	630	2332
17:00			268		344		612	
17:15			295		306		601	
17:30			253		327		580	
17:45			254	1070	347	1324	601	2394
18:00			228		417		645	
18:15			209		338		547	
18:30			357		274		631	
18:45			286	1080	289	1318	575	2398
19:00			270		246		516	
19:15			219		283		502	
19:30			275		212		487	
19:45			322	1086	209	950	531	2036
20:00			301		178		479	
20:15			244		192		436	
20:30			346		191		537	
20:45			393	1284	157	718	550	2002
21:00			343		172		515	
21:15			247		157		404	
21:30			122		149		271	
21:45			129	841	120	598	249	1439
22:00			71		123		194	
22:15			85		102		187	
22:30			96		84		180	
22:45			34	286	74	383	108	669
23:00			51		87		138	
23:15			70		65		135	
23:30			36		45		81	
23:45			31	188	57	254	88	442
TOTALS			9591		11981		21572	
SPLIT %			44.5%		55.5%		62.1%	

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	12,286	22,458	34,744

	NB	SB	EB	WB	Total
AM Peak Hour			11:30	10:00	10:00
AM Pk Volume			721	2018	2618
Pk Hr Factor			0.794	0.987	0.965
7 - 9 Volume	0	0	566	2520	3086
7 - 9 Peak Hour			07:30	07:15	07:15
7 - 9 Pk Volume	0	0	303	1373	1660
Pk Hr Factor	0.000	0.000	0.842	0.933	0.906

	NB	SB	EB	WB	Total
PM Peak Hour			20:30	12:00	17:15
PM Pk Volume			1329	1628	2427
Pk Hr Factor			0.845	0.885	0.941
4 - 6 Volume	0	0	2091	2635	4726
4 - 6 Peak Hour			16:30	16:15	16:45
4 - 6 Pk Volume	0	0	1100	1343	2423
Pk Hr Factor	0.000	0.000	0.932	0.935	0.962

Prepared by NDS/ATD

VOLUME

Magic Mountain Pkwy Bet. Tourney Rd & Wayne Mills Pl

Day: Tuesday
Date: 11/1/2016

City: Santa Clarita
Project #: CA16_5710_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	16,532	15,010	31,542

AM Period	NB	SB	EB		WB		TOTAL	
00:00			36		23		59	
00:15			36		23		59	
00:30			28		10		38	
00:45			26	126	8	64	34	190
01:00			17		13		30	
01:15			19		8		27	
01:30			19		5		24	
01:45			16	71	4	30	20	101
02:00			17		5		22	
02:15			12		1		13	
02:30			15		12		27	
02:45			14	58	5	23	19	81
03:00			9		9		18	
03:15			9		12		21	
03:30			10		21		31	
03:45			14	42	17	59	31	101
04:00			19		22		41	
04:15			15		35		50	
04:30			31		55		86	
04:45			51	116	78	190	129	306
05:00			51		85		136	
05:15			56		159		215	
05:30			58		208		266	
05:45			86	251	224	676	310	927
06:00			67		211		278	
06:15			99		261		360	
06:30			107		319		426	
06:45			143	416	298	1089	441	1505
07:00			127		290		417	
07:15			139		330		469	
07:30			184		338		522	
07:45			244	694	335	1293	579	1987
08:00			218		329		547	
08:15			232		290		522	
08:30			192		276		468	
08:45			216	858	251	1146	467	2004
09:00			212		225		437	
09:15			161		202		363	
09:30			163		178		341	
09:45			188	724	222	827	410	1551
10:00			170		166		336	
10:15			163		176		339	
10:30			205		169		374	
10:45			200	738	185	696	385	1434
11:00			221		177		398	
11:15			215		189		404	
11:30			234		177		411	
11:45			257	927	205	748	462	1675
TOTALS				5021		6841		11862
SPLIT %				42.3%		57.7%		37.6%

PM Period	NB	SB	EB		WB		TOTAL	
12:00			254		195		449	
12:15			264		209		473	
12:30			268		242		510	
12:45			254	1040	231	877	485	1917
13:00			260		238		498	
13:15			226		200		426	
13:30			241		228		469	
13:45			225	952	189	855	414	1807
14:00			242		213		455	
14:15			226		235		461	
14:30			240		228		468	
14:45			266	974	205	881	471	1855
15:00			272		228		500	
15:15			323		250		573	
15:30			367		267		634	
15:45			361	1323	222	967	583	2290
16:00			354		219		573	
16:15			387		207		594	
16:30			389		205		594	
16:45			439	1569	244	875	683	2444
17:00			480		252		732	
17:15			438		246		684	
17:30			453		255		708	
17:45			417	1788	237	990	654	2778
18:00			361		274		635	
18:15			367		228		595	
18:30			318		189		507	
18:45			308	1354	194	885	502	2239
19:00			269		174		443	
19:15			249		177		426	
19:30			215		152		367	
19:45			197	930	139	642	336	1572
20:00			167		144		311	
20:15			143		127		270	
20:30			157		117		274	
20:45			132	599	98	486	230	1085
21:00			131		133		264	
21:15			121		101		222	
21:30			95		82		177	
21:45			104	451	70	386	174	837
22:00			103		61		164	
22:15			92		42		134	
22:30			68		60		128	
22:45			69	332	36	199	105	531
23:00			58		40		98	
23:15			52		40		92	
23:30			44		34		78	
23:45			45	199	12	126	57	325
TOTALS				11511		8169		19680
SPLIT %				58.5%		41.5%		62.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	16,532	15,010	31,542

	NB	SB	EB	WB	TOTAL
AM Peak Hour			11:45	07:15	07:30
AM Pk Volume			1043	1332	2170
Pk Hr Factor			0.973	0.985	0.937
7 - 9 Volume	0	0	1552	2439	3991
7 - 9 Peak Hour			07:45	07:15	07:30
7 - 9 Pk Volume	0	0	886	1332	2170
Pk Hr Factor	0.000	0.000	0.908	0.985	0.937

	NB	SB	EB	WB	TOTAL
PM Peak Hour			16:45	17:15	16:45
PM Pk Volume			1810	1012	2807
Pk Hr Factor			0.943	0.923	0.959
4 - 6 Volume	0	0	3357	1865	5222
4 - 6 Peak Hour			16:45	16:45	16:45
4 - 6 Pk Volume	0	0	1810	997	2807
Pk Hr Factor	0.000	0.000	0.943	0.977	0.959

- AM/PM Peak Hour Turn Counts

ITM Peak Hour Summary

Prepared by:

NDS

National Data & Surveying Services

I-5 SB Ramps and Magic Mountain Pkwy , Santa Clarita

Date:	10/25/2016
Day:	Tuesday
Project #:	16-5709-002
City:	Santa Clarita

N

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	445 PM

Peak Hour Summary

CONTROL: Signalized

Southbound Approach (I-5 SB Ramps)

	Left	Through	Right	Out
Lanes	2	0.5	1.5	
AM	30	1	317	0
NOON	0	0	0	0
PM	57	1	317	0

Eastbound Approach (Magic Mountain Pkwy)

	Lanes	AM	NOON	PM
Out		1497	0	1247
Left	0	0	0	0
Through	3	244	0	435
Right	2	75	0	167

Westbound Approach

	AM	NOON	PM	Lanes
Left	0	0	0	0
Through	1467	0	1190	4
Right	568	0	419	2
Out	561	0	752	

Northbound Approach

	Out	Left	Through	Right
AM	644	0	0	0
NOON	0	0	0	0
PM	587	0	0	0
Lanes		0	0	0

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs

Leg		AM	NOON	PM
North Leg	In	348	0	375
North Leg	Out	0	0	0
West Leg	Out	1497	0	1247
West Leg	In	319	0	602
East Leg	In	2035	0	1609
East Leg	Out	561	0	752
South Leg	Out	644	0	587
South Leg	In	0	0	0

Total Volume Per Leg

Leg	AM	NOON	PM
North Leg	348	0	375
West Leg	1816	0	1849
East Leg	2596	0	2361
South Leg	644	0	587

ITM Peak Hour Summary

Prepared by:

NDS

National Data & Surveying Services

I-5 NB Ramps and Magic Mountain Pkwy , Santa Clarita

Date: 10/25/2016

Day: Tuesday

Project #: 16-5709-001

City: Santa Clarita

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	445 PM

Peak Hour Summary

I-5 NB Ramps

Magic Mountain Pkwy

CONTROL: Signalized

Southbound Approach

	Movement 1	Movement 2	Movement 3	Out
Lanes	0	0	0	
AM	0	0	0	258
NOON	0	0	0	0
PM	0	0	0	448

Eastbound Approach

	Lanes	AM	NOON	PM
Out		2036	0	1602
Movement 1	2	29	0	51
Movement 2	3	531	0	696
Movement 3	0	0	0	0

Westbound Approach

	AM	NOON	PM	Lanes
Movement 1	229	0	396	1.5
Movement 2	893	0	712	3.5
Movement 3	0	0	0	0
Out	1097	0	1554	

Northbound Approach

	Out	Movement 1	Movement 2	Movement 3
AM	0	1143	0	566
NOON	0	0	0	0
PM	0	890	1	858
Lanes		2	0.5	1.5

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs

Leg		AM	NOON	PM
North Leg		0 / 258	0 / 0	0 / 448
West Leg		2036 / 560	0 / 0	1602 / 747
East Leg		1122 / 1097	0 / 0	1108 / 1554
South Leg		0 / 1709	0 / 0	0 / 1749

Total Volume Per Leg

Leg	AM	NOON	PM
North Leg	258	0	448
West Leg	2596	0	2349
East Leg	2219	0	2662
South Leg	1709	0	1749

ITM Peak Hour Summary

Prepared by:

NDS

National Data & Surveying Services

The Old Rd and Magic Mountain Pkwy , Santa Clarita

Date: 10/25/2016

Day: Tuesday

Project #: 16-5709-003

City: Santa Clarita

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	445 PM

Peak Hour Summary

N

The Old Rd

Magic Mountain Pkwy

Southbound Approach

Lanes	1	3	2	
AM	1	270	162	1754
NOON	0	0	0	0
PM	1	608	331	1474

Westbound Approach

Lanes	AM	NOON	PM
1	1256	0	1031
4	77	0	11
2	169	0	205
	322	0	623

Northbound Approach

		2	3	1
AM	441	20	479	114
NOON	0	0	0	0
PM	827	22	426	183

Eastbound Approach

Lanes	AM	NOON	PM
	98	0	34
2	19	0	17
4	46	0	109
1	2	0	14

CONTROL

Signalized

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs

North Leg

AM	433	1754
NOON	0	0
PM	940	1474

East Leg

	AM	NOON	PM
	1502	0	1247
	322	0	623

South Leg

AM	441	613
NOON	0	0
PM	827	631

West Leg

AM	NOON	PM
98	0	34
67	0	140

Total Volume Per Leg

North Leg

AM	2187
NOON	0
PM	2414

East Leg

AM	NOON	PM
1824	0	1870

South Leg

AM	1054
NOON	0
PM	1458

West Leg

AM	NOON	PM
165	0	174

ITM Peak Hour Summary

Prepared by:

NDS

National Data & Surveying Services

Tourney Rd and Magic Mountain Pkwy , Santa Clarita

Date: 10/25/2016

Day: Tuesday

Project #: 16-5709-004

City: Santa Clarita

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	445 PM

N

Peak Hour Summary

CONTROL: Signalized

Southbound Approach (Tourney Rd)

	Left	Through	Right	Out
Lanes	0	0	0	
AM	0	0	0	0
NOON	0	0	0	0
PM	0	0	0	0

Eastbound Approach (Magic Mountain Pkwy)

	AM	NOON	PM
Out	1129	0	1108

Lanes	Movement	AM	NOON	PM
0	Left	0	0	0
3	Through	866	0	1447
1	Right	233	0	118

Westbound Approach

Movement	AM	NOON	PM	Lanes
Right	0	0	0	0
Through	1011	0	862	3
Left	346	0	138	1
Out	928	0	1779	

Northbound Approach

	Out	Left	Through	Right
AM	579	118	0	62
NOON	0	0	0	0
PM	256	246	0	332
Lanes		2	0	1

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs

Leg	Period	Out	In
North Leg	AM	0	0
North Leg	NOON	0	0
North Leg	PM	0	0
West Leg	AM	1129	1099
West Leg	NOON	0	0
West Leg	PM	1108	1565
East Leg	AM	928	1357
East Leg	NOON	0	0
East Leg	PM	1779	1000
South Leg	AM	579	180
South Leg	NOON	0	0
South Leg	PM	256	578

Total Volume Per Leg

Leg	AM	NOON	PM
North Leg	0	0	0
West Leg	2228	0	2673
East Leg	2285	0	2779
South Leg	759	0	834

ITM Peak Hour Summary

Prepared by:

NDS

National Data & Surveying Services

Tourney Rd and Wayne Mills Pl , Santa Clarita

Date:	10/25/2016
Day:	Tuesday

Project #:	16-5709-005
City:	Santa Clarita

AM Peak Hour	800 AM
NOON Peak Hour	
PM Peak Hour	430 PM

Peak Hour Summary

N

Tourney Rd

Wayne Mills Pl

CONTROL

2-Way Stop (EB/WB)

Southbound Approach

Lanes	1	1	1		
AM	23	420	162	161	AM
NOON	0	0	0	0	NOON
PM	34	133	97	585	PM

Eastbound Approach

	AM	NOON	PM
	28	0	40

Lanes	AM	NOON	PM
0.5	24	0	18
0.5	2	0	4
1	2	0	7

Westbound Approach

AM	NOON	PM	Lanes
58	0	100	0
0	0	3	1
46	0	43	0

AM	NOON	PM
205	0	132

Northbound Approach

AM	468	5	79	41	AM
NOON	0	0	0	0	NOON
PM	183	3	467	31	PM
		1	1	1	Lanes

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs

North Leg

605	161	AM
0	0	NOON
264	585	PM

West Leg

AM	NOON	PM
28	0	40
28	0	29

East Leg

AM	NOON	PM
104	0	146
205	0	132

South Leg

AM	468	125
NOON	0	0
PM	183	501

Total Volume Per Leg

Leg	AM	NOON	PM
North Leg	766	0	849
West Leg	56	0	69
East Leg	309	0	278
South Leg	593	0	684

APPENDIX B

- Existing Conditions Analysis Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱↱	↰↰	↑↑↑↑					↰	↰↑	↱↱
Volume (vph)	0	244	75	568	1467	0	0	0	0	317	1	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0					5.0	5.0	5.0
Lane Util. Factor		0.91	0.88	0.97	0.86					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	2787	3433	6408					1681	1686	2787
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	2787	3433	6408					1681	1686	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	265	82	617	1595	0	0	0	0	345	1	33
RTOR Reduction (vph)	0	0	56	0	0	0	0	0	0	0	0	26
Lane Group Flow (vph)	0	265	26	617	1595	0	0	0	0	172	174	7
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		29.0	29.0	27.0	61.0					19.0	19.0	19.0
Effective Green, g (s)		29.0	29.0	27.0	61.0					19.0	19.0	19.0
Actuated g/C Ratio		0.32	0.32	0.30	0.68					0.21	0.21	0.21
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1638	898	1029	4343					354	355	588
v/s Ratio Prot		0.05		c0.18	c0.25					0.10	c0.10	
v/s Ratio Perm			0.01									0.00
v/c Ratio		0.16	0.03	0.60	0.37					0.49	0.49	0.01
Uniform Delay, d1		21.8	20.9	26.9	6.2					31.2	31.2	28.1
Progression Factor		1.00	1.00	0.74	0.46					1.00	1.00	1.00
Incremental Delay, d2		0.2	0.1	0.7	0.2					4.7	4.8	0.0
Delay (s)		22.0	20.9	20.7	3.0					35.9	36.0	28.1
Level of Service		C	C	C	A					D	D	C
Approach Delay (s)		21.8			8.0			0.0			35.3	
Approach LOS		C			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱↱	↰↰	↑↑↑↑					↰	↰↑	↱↱
Volume (vph)	0	435	167	419	1190	0	0	0	0	317	1	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0					5.0	5.0	5.0
Lane Util. Factor		0.91	0.88	0.97	0.86					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	2787	3433	6408					1681	1686	2787
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	2787	3433	6408					1681	1686	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	473	182	455	1293	0	0	0	0	345	1	62
RTOR Reduction (vph)	0	0	119	0	0	0	0	0	0	0	0	48
Lane Group Flow (vph)	0	473	63	455	1293	0	0	0	0	172	174	14
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		31.0	31.0	23.0	59.0					21.0	21.0	21.0
Effective Green, g (s)		31.0	31.0	23.0	59.0					21.0	21.0	21.0
Actuated g/C Ratio		0.34	0.34	0.26	0.66					0.23	0.23	0.23
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1751	959	877	4200					392	393	650
v/s Ratio Prot		0.09		c0.13	c0.20					0.10	c0.10	
v/s Ratio Perm			0.02									0.01
v/c Ratio		0.27	0.07	0.52	0.31					0.44	0.44	0.02
Uniform Delay, d1		21.3	19.8	28.8	6.7					29.5	29.5	26.6
Progression Factor		1.00	1.00	0.78	0.47					1.00	1.00	1.00
Incremental Delay, d2		0.4	0.1	0.4	0.2					3.5	3.6	0.1
Delay (s)		21.7	19.9	22.8	3.3					33.0	33.1	26.7
Level of Service		C	B	C	A					C	C	C
Approach Delay (s)		21.2			8.3			0.0			32.1	
Approach LOS		C			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↑			↑↑↑↱	↱	↰↰	↱	↱			
Volume (vph)	29	531	0	0	893	229	1143	0	566	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor	0.97	0.91			0.81	0.81	0.97	0.95	0.95			
Frt	1.00	1.00			0.99	0.85	1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	5085			6004	1282	3433	1504	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	5085			6004	1282	3433	1504	1504			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	32	577	0	0	971	249	1242	0	615	0	0	0
RTOR Reduction (vph)	0	0	0	0	5	153	0	65	65	0	0	0
Lane Group Flow (vph)	32	577	0	0	1001	61	1242	243	242	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	2.4	33.0			25.6	25.6	47.0	47.0	47.0			
Effective Green, g (s)	2.4	33.0			25.6	25.6	47.0	47.0	47.0			
Actuated g/C Ratio	0.03	0.37			0.28	0.28	0.52	0.52	0.52			
Clearance Time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	91	1864			1707	364	1792	785	785			
v/s Ratio Prot	0.01	c0.11			c0.17		c0.36	0.16				
v/s Ratio Perm						0.05			0.16			
v/c Ratio	0.35	0.31			0.59	0.17	0.69	0.31	0.31			
Uniform Delay, d1	43.0	20.4			27.7	24.2	16.1	12.2	12.2			
Progression Factor	0.47	0.26			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	2.2	0.4			1.5	1.0	2.2	1.0	1.0			
Delay (s)	22.6	5.7			29.1	25.2	18.3	13.3	13.3			
Level of Service	C	A			C	C	B	B	B			
Approach Delay (s)		6.6			28.4			16.7			0.0	
Approach LOS		A			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↑			↑↑↑↑↱	↱	↰↰	↱	↱			
Volume (vph)	51	696	0	0	712	396	890	1	858	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor	0.97	0.91			0.81	0.81	0.97	0.95	0.95			
Frt	1.00	1.00			0.97	0.85	1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	5085			5841	1282	3433	1505	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	5085			5841	1282	3433	1505	1504			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	757	0	0	774	430	967	1	933	0	0	0
RTOR Reduction (vph)	0	0	0	0	54	154	0	41	43	0	0	0
Lane Group Flow (vph)	55	757	0	0	931	65	967	427	424	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	3.2	35.0			26.8	26.8	45.0	45.0	45.0			
Effective Green, g (s)	3.2	35.0			26.8	26.8	45.0	45.0	45.0			
Actuated g/C Ratio	0.04	0.39			0.30	0.30	0.50	0.50	0.50			
Clearance Time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	122	1977			1739	381	1716	752	752			
v/s Ratio Prot	0.02	c0.15			c0.16		0.28	c0.28				
v/s Ratio Perm						0.05			0.28			
v/c Ratio	0.45	0.38			0.54	0.17	0.56	0.57	0.56			
Uniform Delay, d1	42.5	19.7			26.4	23.4	15.7	15.7	15.7			
Progression Factor	0.64	0.47			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	2.5	0.5			1.2	1.0	1.3	3.1	3.0			
Delay (s)	29.8	9.8			27.6	24.4	17.0	18.8	18.7			
Level of Service	C	A			C	C	B	B	B			
Approach Delay (s)		11.1			27.0			17.9			0.0	
Approach LOS		B			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	866	233	346	1011	118	62
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4684	1458	1630	4684	3162	1458
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4684	1458	1630	4684	3162	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	941	253	376	1099	128	67
RTOR Reduction (vph)	0	172	0	0	0	58
Lane Group Flow (vph)	941	81	376	1099	128	9
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	31.2	31.2	38.0	74.2	13.4	13.4
Effective Green, g (s)	31.2	31.2	38.0	74.2	13.4	13.4
Actuated g/C Ratio	0.32	0.32	0.39	0.76	0.14	0.14
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1497	466	634	3560	434	200
v/s Ratio Prot	c0.20		c0.23	0.23	c0.04	
v/s Ratio Perm		0.06				0.01
v/c Ratio	0.63	0.17	0.59	0.31	0.29	0.05
Uniform Delay, d1	28.3	23.9	23.7	3.7	37.9	36.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.2	1.5	0.0	0.4	0.1
Delay (s)	29.1	24.1	25.2	3.7	38.2	36.6
Level of Service	C	C	C	A	D	D
Approach Delay (s)	28.0			9.2	37.7	
Approach LOS	C			A	D	

Intersection Summary			
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	97.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1447	118	138	862	246	332
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4684	1458	1630	4684	3162	1458
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4684	1458	1630	4684	3162	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1573	128	150	937	267	361
RTOR Reduction (vph)	0	46	0	0	0	286
Lane Group Flow (vph)	1573	82	150	937	267	75
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	54.9	54.9	17.3	77.2	18.4	18.4
Effective Green, g (s)	54.9	54.9	17.3	77.2	18.4	18.4
Actuated g/C Ratio	0.52	0.52	0.16	0.73	0.17	0.17
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2435	757	267	3424	550	254
v/s Ratio Prot	c0.34		c0.09	0.20	c0.08	
v/s Ratio Perm		0.06				0.05
v/c Ratio	0.65	0.11	0.56	0.27	0.49	0.30
Uniform Delay, d1	18.3	12.9	40.7	4.8	39.3	38.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.1	2.7	0.0	0.7	0.7
Delay (s)	18.9	13.0	43.4	4.8	40.0	38.6
Level of Service	B	B	D	A	D	D
Approach Delay (s)	18.5			10.1	39.2	
Approach LOS	B			B	D	

Intersection Summary			
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	105.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	24	2	2	46	0	58	5	79	41	162	420	23
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	2	2	50	0	63	5	86	45	176	457	25
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			6									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	968	950	457	908	930	86	482			130		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	968	950	457	908	930	86	482			130		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	87	99	100	78	100	94	99			88		
cM capacity (veh/h)	197	227	604	229	234	973	1081			1455		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	30	113	5	86	45	176	457	25
Volume Left	26	50	5	0	0	176	0	0
Volume Right	2	63	0	0	45	0	0	25
cSH	215	400	1081	1700	1700	1455	1700	1700
Volume to Capacity	0.14	0.28	0.01	0.05	0.03	0.12	0.27	0.01
Queue Length 95th (ft)	12	29	0	0	0	10	0	0
Control Delay (s)	24.9	17.5	8.3	0.0	0.0	7.8	0.0	0.0
Lane LOS	C	C	A			A		
Approach Delay (s)	24.9	17.5	0.3			2.1		
Approach LOS	C	C						

Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	41.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	4	7	43	3	100	3	467	31	97	133	34
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	4	8	47	3	109	3	508	34	105	145	37
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			6									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	980	903	145	876	907	508	182			541		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	980	903	145	876	907	508	182			541		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	88	98	99	81	99	81	100			90		
cM capacity (veh/h)	168	248	903	243	247	565	1394			1027		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	32	159	3	508	34	105	145	37
Volume Left	20	47	3	0	0	105	0	0
Volume Right	8	109	0	0	34	0	0	37
cSH	241	399	1394	1700	1700	1027	1700	1700
Volume to Capacity	0.13	0.40	0.00	0.30	0.02	0.10	0.09	0.02
Queue Length 95th (ft)	11	47	0	0	0	9	0	0
Control Delay (s)	23.1	19.9	7.6	0.0	0.0	8.9	0.0	0.0
Lane LOS	C	C	A			A		
Approach Delay (s)	23.1	19.9	0.0			3.3		
Approach LOS	C	C						

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		

APPENDIX C

- Existing + Project Conditions Analysis Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	256	75	580	1475	0	0	0	0	329	1	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0					5.0	5.0	5.0
Lane Util. Factor		0.91	0.88	0.97	0.86					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	2787	3433	6408					1681	1686	2787
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	2787	3433	6408					1681	1686	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	278	82	630	1603	0	0	0	0	358	1	33
RTOR Reduction (vph)	0	0	56	0	0	0	0	0	0	0	0	26
Lane Group Flow (vph)	0	278	26	630	1603	0	0	0	0	179	180	7
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		29.0	29.0	27.0	61.0					19.0	19.0	19.0
Effective Green, g (s)		29.0	29.0	27.0	61.0					19.0	19.0	19.0
Actuated g/C Ratio		0.32	0.32	0.30	0.68					0.21	0.21	0.21
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1638	898	1029	4343					354	355	588
v/s Ratio Prot		0.05		c0.18	c0.25					0.11	c0.11	
v/s Ratio Perm			0.01									0.00
v/c Ratio		0.17	0.03	0.61	0.37					0.51	0.51	0.01
Uniform Delay, d1		21.9	20.9	27.0	6.2					31.4	31.4	28.1
Progression Factor		1.00	1.00	0.74	0.45					1.00	1.00	1.00
Incremental Delay, d2		0.2	0.1	0.8	0.2					5.1	5.1	0.0
Delay (s)		22.1	20.9	20.7	3.0					36.4	36.5	28.1
Level of Service		C	C	C	A					D	D	C
Approach Delay (s)		21.8			8.0			0.0			35.7	
Approach LOS		C			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

1: Magic Mountain Pkwy & I-5 SB Ramps

Timing Plan: PM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱↱	↰↰	↑↑↑↑					↰	↰↑	↱↱
Volume (vph)	0	448	167	431	1198	0	0	0	0	330	1	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0					5.0	5.0	5.0
Lane Util. Factor		0.91	0.88	0.97	0.86					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	2787	3433	6408					1681	1686	2787
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	2787	3433	6408					1681	1686	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	487	182	468	1302	0	0	0	0	359	1	62
RTOR Reduction (vph)	0	0	119	0	0	0	0	0	0	0	0	48
Lane Group Flow (vph)	0	487	63	468	1302	0	0	0	0	179	181	14
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		31.0	31.0	23.0	59.0					21.0	21.0	21.0
Effective Green, g (s)		31.0	31.0	23.0	59.0					21.0	21.0	21.0
Actuated g/C Ratio		0.34	0.34	0.26	0.66					0.23	0.23	0.23
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1751	959	877	4200					392	393	650
v/s Ratio Prot		0.10		c0.14	c0.20					0.11	c0.11	
v/s Ratio Perm			0.02									0.01
v/c Ratio		0.28	0.07	0.53	0.31					0.46	0.46	0.02
Uniform Delay, d1		21.4	19.8	28.9	6.7					29.6	29.6	26.6
Progression Factor		1.00	1.00	0.79	0.50					1.00	1.00	1.00
Incremental Delay, d2		0.4	0.1	0.5	0.2					3.8	3.8	0.1
Delay (s)		21.8	19.9	23.2	3.5					33.4	33.5	26.7
Level of Service		C	B	C	A					C	C	C
Approach Delay (s)		21.3			8.7			0.0			32.4	
Approach LOS		C			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↑			↑↑↑↱	↱	↰↰	↱	↱			
Volume (vph)	29	555	0	0	913	237	1143	0	584	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor	0.97	0.91			0.81	0.81	0.97	0.95	0.95			
Frt	1.00	1.00			0.99	0.85	1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	5085			6001	1282	3433	1504	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	5085			6001	1282	3433	1504	1504			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	32	603	0	0	992	258	1242	0	635	0	0	0
RTOR Reduction (vph)	0	0	0	0	6	157	0	59	59	0	0	0
Lane Group Flow (vph)	32	603	0	0	1025	62	1242	259	258	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	2.4	33.0			25.6	25.6	47.0	47.0	47.0			
Effective Green, g (s)	2.4	33.0			25.6	25.6	47.0	47.0	47.0			
Actuated g/C Ratio	0.03	0.37			0.28	0.28	0.52	0.52	0.52			
Clearance Time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	91	1864			1706	364	1792	785	785			
v/s Ratio Prot	0.01	c0.12			c0.17		c0.36	0.17				
v/s Ratio Perm						0.05			0.17			
v/c Ratio	0.35	0.32			0.60	0.17	0.69	0.33	0.33			
Uniform Delay, d1	43.0	20.5			27.8	24.2	16.1	12.4	12.4			
Progression Factor	0.53	0.32			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	2.2	0.4			1.6	1.0	2.2	1.1	1.1			
Delay (s)	25.1	7.1			29.4	25.2	18.3	13.5	13.5			
Level of Service	C	A			C	C	B	B	B			
Approach Delay (s)		8.0			28.6			16.7			0.0	
Approach LOS		A			C			B			A	

Intersection Summary

HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↑			↑↑↑↱	↱	↰↰	↱	↱			
Volume (vph)	51	722	0	0	733	404	890	1	877	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor	0.97	0.91			0.81	0.81	0.97	0.95	0.95			
Frt	1.00	1.00			0.97	0.85	1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	5085			5843	1282	3433	1505	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	5085			5843	1282	3433	1505	1504			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	785	0	0	797	439	967	1	953	0	0	0
RTOR Reduction (vph)	0	0	0	0	53	157	0	37	43	0	0	0
Lane Group Flow (vph)	55	785	0	0	959	67	967	441	434	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	3.2	35.0			26.8	26.8	45.0	45.0	45.0			
Effective Green, g (s)	3.2	35.0			26.8	26.8	45.0	45.0	45.0			
Actuated g/C Ratio	0.04	0.39			0.30	0.30	0.50	0.50	0.50			
Clearance Time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	122	1977			1739	381	1716	752	752			
v/s Ratio Prot	0.02	c0.15			c0.16		0.28	c0.29				
v/s Ratio Perm						0.05			0.29			
v/c Ratio	0.45	0.40			0.55	0.18	0.56	0.59	0.58			
Uniform Delay, d1	42.5	19.9			26.5	23.4	15.7	15.9	15.8			
Progression Factor	0.65	0.48			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	2.5	0.6			1.3	1.0	1.3	3.3	3.2			
Delay (s)	30.3	10.1			27.8	24.4	17.0	19.3	19.0			
Level of Service	C	B			C	C	B	B	B			
Approach Delay (s)		11.4			27.2			18.1			0.0	
Approach LOS		B			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	866	274	358	1011	146	62
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4684	1458	1630	4684	3162	1458
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4684	1458	1630	4684	3162	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	941	298	389	1099	159	67
RTOR Reduction (vph)	0	204	0	0	0	58
Lane Group Flow (vph)	941	94	389	1099	159	9
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	31.9	31.9	39.7	76.6	14.2	14.2
Effective Green, g (s)	31.9	31.9	39.7	76.6	14.2	14.2
Actuated g/C Ratio	0.32	0.32	0.39	0.76	0.14	0.14
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1482	461	641	3559	445	205
v/s Ratio Prot	c0.20		c0.24	0.23	c0.05	
v/s Ratio Perm		0.06				0.01
v/c Ratio	0.63	0.20	0.61	0.31	0.36	0.05
Uniform Delay, d1	29.5	25.2	24.3	3.8	39.2	37.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.2	1.6	0.0	0.5	0.1
Delay (s)	30.4	25.4	26.0	3.8	39.7	37.5
Level of Service	C	C	C	A	D	D
Approach Delay (s)	29.2			9.6	39.0	
Approach LOS	C			A	D	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1447	163	151	862	275	332
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4684	1458	1630	4684	3162	1458
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4684	1458	1630	4684	3162	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1573	177	164	937	299	361
RTOR Reduction (vph)	0	63	0	0	0	284
Lane Group Flow (vph)	1573	114	164	937	299	77
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	57.3	57.3	18.6	80.9	19.7	19.7
Effective Green, g (s)	57.3	57.3	18.6	80.9	19.7	19.7
Actuated g/C Ratio	0.52	0.52	0.17	0.73	0.18	0.18
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2426	755	274	3426	563	259
v/s Ratio Prot	c0.34		c0.10	0.20	c0.09	
v/s Ratio Perm		0.08				0.05
v/c Ratio	0.65	0.15	0.60	0.27	0.53	0.30
Uniform Delay, d1	19.3	13.9	42.5	5.0	41.3	39.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.1	3.5	0.0	1.0	0.6
Delay (s)	19.9	14.0	46.0	5.0	42.2	40.1
Level of Service	B	B	D	A	D	D
Approach Delay (s)	19.3			11.1	41.0	
Approach LOS	B			B	D	

Intersection Summary			
HCM 2000 Control Delay	20.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	110.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	52	10	6	46	0	58	11	79	41	162	420	76
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	57	11	7	50	0	63	12	86	45	176	457	83
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			6									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	982	963	457	927	1001	86	539			130		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	982	963	457	927	1001	86	539			130		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	71	95	99	77	100	94	99			88		
cM capacity (veh/h)	192	222	604	213	211	973	1029			1455		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	74	113	12	86	45	176	457	83
Volume Left	57	50	12	0	0	176	0	0
Volume Right	7	63	0	0	45	0	0	83
cSH	216	378	1029	1700	1700	1455	1700	1700
Volume to Capacity	0.34	0.30	0.01	0.05	0.03	0.12	0.27	0.05
Queue Length 95th (ft)	36	31	1	0	0	10	0	0
Control Delay (s)	30.6	18.6	8.5	0.0	0.0	7.8	0.0	0.0
Lane LOS	D	C	A			A		
Approach Delay (s)	30.6	18.6	0.7			1.9		
Approach LOS	D	C						

Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	41.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	47	12	11	43	3	100	9	467	31	97	133	92
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	51	13	12	47	3	109	10	508	34	105	145	100
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			6									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	993	916	145	895	983	508	245			541		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	993	916	145	895	983	508	245			541		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	69	95	99	79	99	81	99			90		
cM capacity (veh/h)	164	242	903	227	222	565	1322			1027		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	76	159	10	508	34	105	145	100
Volume Left	51	47	10	0	0	105	0	0
Volume Right	12	109	0	0	34	0	0	100
cSH	214	384	1322	1700	1700	1027	1700	1700
Volume to Capacity	0.36	0.41	0.01	0.30	0.02	0.10	0.09	0.06
Queue Length 95th (ft)	38	49	1	0	0	9	0	0
Control Delay (s)	31.5	20.8	7.7	0.0	0.0	8.9	0.0	0.0
Lane LOS	D	C	A			A		
Approach Delay (s)	31.5	20.8	0.1			2.7		
Approach LOS	D	C						

Intersection Summary			
Average Delay	5.9		
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	28	0	101	28	0	68
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	0	110	30	0	74
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			30		280	30
vC1, stage 1 conf vol					30	
vC2, stage 2 conf vol					250	
vCu, unblocked vol			30		280	30
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			93		100	93
cM capacity (veh/h)			1582		716	1044

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	30	110	30	74
Volume Left	0	110	0	0
Volume Right	0	0	0	74
cSH	1700	1582	1700	1044
Volume to Capacity	0.02	0.07	0.02	0.07
Queue Length 95th (ft)	0	6	0	6
Control Delay (s)	0.0	7.4	0.0	8.7
Lane LOS		A		A
Approach Delay (s)	0.0	5.8		8.7
Approach LOS				A

Intersection Summary			
Average Delay	6.0		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	29	0	109	40	0	71
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	0	118	43	0	77
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			32		312	32
vC1, stage 1 conf vol					32	
vC2, stage 2 conf vol					280	
vCu, unblocked vol			32		312	32
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			93		100	93
cM capacity (veh/h)			1581		690	1042

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	32	118	43	77
Volume Left	0	118	0	0
Volume Right	0	0	0	77
cSH	1700	1581	1700	1042
Volume to Capacity	0.02	0.07	0.03	0.07
Queue Length 95th (ft)	0	6	0	6
Control Delay (s)	0.0	7.5	0.0	8.7
Lane LOS		A		A
Approach Delay (s)	0.0	5.5		8.7
Approach LOS				A

Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	23.8%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX D

- 2018 Opening Day Conditions Analysis Worksheets

Santa Clarita Wayne Mills Hotel
1: Magic Mountain Pkwy & I-5 SB Ramps

Existing Plus Ambient
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱↱	↰↰	↑↑↑↑					↰	↰↑	↱↱
Volume (vph)	0	259	80	602	1555	0	0	0	0	336	1	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0					5.0	5.0	5.0
Lane Util. Factor		0.91	0.88	0.97	0.86					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	2787	3433	6408					1681	1686	2787
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	2787	3433	6408					1681	1686	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	282	87	654	1690	0	0	0	0	365	1	35
RTOR Reduction (vph)	0	0	59	0	0	0	0	0	0	0	0	28
Lane Group Flow (vph)	0	282	28	654	1690	0	0	0	0	182	184	7
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		29.0	29.0	27.0	61.0					19.0	19.0	19.0
Effective Green, g (s)		29.0	29.0	27.0	61.0					19.0	19.0	19.0
Actuated g/C Ratio		0.32	0.32	0.30	0.68					0.21	0.21	0.21
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1638	898	1029	4343					354	355	588
v/s Ratio Prot		0.06		c0.19	c0.26					0.11	c0.11	
v/s Ratio Perm			0.01									0.00
v/c Ratio		0.17	0.03	0.64	0.39					0.51	0.52	0.01
Uniform Delay, d1		21.9	20.9	27.2	6.3					31.4	31.4	28.1
Progression Factor		1.00	1.00	0.76	0.51					1.00	1.00	1.00
Incremental Delay, d2		0.2	0.1	1.0	0.2					5.3	5.3	0.0
Delay (s)		22.1	20.9	21.8	3.4					36.7	36.8	28.1
Level of Service		C	C	C	A					D	D	C
Approach Delay (s)		21.8			8.6			0.0			36.0	
Approach LOS		C			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱↱	↰↰	↑↑↑↑					↰	↰↑	↱↱
Volume (vph)	0	461	177	444	1261	0	0	0	0	336	1	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0					5.0	5.0	5.0
Lane Util. Factor		0.91	0.88	0.97	0.86					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	2787	3433	6408					1681	1686	2787
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	2787	3433	6408					1681	1686	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	501	192	483	1371	0	0	0	0	365	1	65
RTOR Reduction (vph)	0	0	126	0	0	0	0	0	0	0	0	50
Lane Group Flow (vph)	0	501	66	483	1371	0	0	0	0	182	184	15
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		31.0	31.0	23.0	59.0					21.0	21.0	21.0
Effective Green, g (s)		31.0	31.0	23.0	59.0					21.0	21.0	21.0
Actuated g/C Ratio		0.34	0.34	0.26	0.66					0.23	0.23	0.23
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1751	959	877	4200					392	393	650
v/s Ratio Prot		0.10		c0.14	c0.21					0.11	c0.11	
v/s Ratio Perm			0.02									0.01
v/c Ratio		0.29	0.07	0.55	0.33					0.46	0.47	0.02
Uniform Delay, d1		21.5	19.8	29.0	6.8					29.7	29.7	26.6
Progression Factor		1.00	1.00	0.82	0.57					1.00	1.00	1.00
Incremental Delay, d2		0.4	0.1	0.6	0.2					3.9	4.0	0.1
Delay (s)		21.9	19.9	24.5	4.1					33.6	33.7	26.7
Level of Service		C	B	C	A					C	C	C
Approach Delay (s)		21.3			9.4			0.0			32.6	
Approach LOS		C			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	31	563	0	0	947	243	1212	0	600	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor	0.97	0.91			0.81	0.81	0.97	0.95	0.95			
Frt	1.00	1.00			0.99	0.85	1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	5085			6004	1282	3433	1504	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	5085			6004	1282	3433	1504	1504			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	612	0	0	1029	264	1317	0	652	0	0	0
RTOR Reduction (vph)	0	0	0	0	5	162	0	57	57	0	0	0
Lane Group Flow (vph)	34	612	0	0	1061	65	1317	269	269	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	2.4	33.0			25.6	25.6	47.0	47.0	47.0			
Effective Green, g (s)	2.4	33.0			25.6	25.6	47.0	47.0	47.0			
Actuated g/C Ratio	0.03	0.37			0.28	0.28	0.52	0.52	0.52			
Clearance Time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	91	1864			1707	364	1792	785	785			
v/s Ratio Prot	0.01	c0.12			c0.18		c0.38	0.18				
v/s Ratio Perm						0.05			0.18			
v/c Ratio	0.37	0.33			0.62	0.18	0.73	0.34	0.34			
Uniform Delay, d1	43.1	20.5			28.0	24.3	16.7	12.5	12.5			
Progression Factor	0.49	0.27			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	2.4	0.4			1.7	1.1	2.7	1.2	1.2			
Delay (s)	23.4	6.0			29.7	25.3	19.4	13.7	13.7			
Level of Service	C	A			C	C	B	B	B			
Approach Delay (s)		6.9			28.9			17.5			0.0	
Approach LOS		A			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	54	738	0	0	755	420	943	1	909	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor	0.97	0.91			0.81	0.81	0.97	0.95	0.95			
Frt	1.00	1.00			0.97	0.85	1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	5085			5841	1282	3433	1505	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	5085			5841	1282	3433	1505	1504			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	59	802	0	0	821	457	1025	1	988	0	0	0
RTOR Reduction (vph)	0	0	0	0	54	164	0	35	43	0	0	0
Lane Group Flow (vph)	59	802	0	0	991	69	1025	460	452	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	3.2	35.0			26.8	26.8	45.0	45.0	45.0			
Effective Green, g (s)	3.2	35.0			26.8	26.8	45.0	45.0	45.0			
Actuated g/C Ratio	0.04	0.39			0.30	0.30	0.50	0.50	0.50			
Clearance Time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	122	1977			1739	381	1716	752	752			
v/s Ratio Prot	0.02	c0.16			c0.17		0.30	c0.31				
v/s Ratio Perm						0.05			0.30			
v/c Ratio	0.48	0.41			0.57	0.18	0.60	0.61	0.60			
Uniform Delay, d1	42.6	20.0			26.7	23.5	16.0	16.2	16.1			
Progression Factor	0.60	0.42			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	2.8	0.6			1.4	1.0	1.5	3.7	3.5			
Delay (s)	28.4	8.9			28.1	24.5	17.6	19.9	19.6			
Level of Service	C	A			C	C	B	B	B			
Approach Delay (s)		10.2			27.4			18.6			0.0	
Approach LOS		B			C			B			A	

Intersection Summary

HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	918	247	367	1072	125	66
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4684	1458	1630	4684	3162	1458
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4684	1458	1630	4684	3162	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	998	268	399	1165	136	72
RTOR Reduction (vph)	0	180	0	0	0	62
Lane Group Flow (vph)	998	88	399	1165	136	10
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	33.8	33.8	40.3	79.1	13.7	13.7
Effective Green, g (s)	33.8	33.8	40.3	79.1	13.7	13.7
Actuated g/C Ratio	0.33	0.33	0.39	0.77	0.13	0.13
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1540	479	638	3604	421	194
v/s Ratio Prot	c0.21		c0.24	0.25	c0.04	
v/s Ratio Perm		0.06				0.01
v/c Ratio	0.65	0.18	0.63	0.32	0.32	0.05
Uniform Delay, d1	29.4	24.6	25.2	3.6	40.4	38.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.2	1.9	0.1	0.4	0.1
Delay (s)	30.4	24.8	27.1	3.7	40.8	39.0
Level of Service	C	C	C	A	D	D
Approach Delay (s)	29.2			9.7	40.2	
Approach LOS	C			A	D	

Intersection Summary

HCM 2000 Control Delay	19.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	102.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1534	125	146	914	261	352
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4684	1458	1630	4684	3162	1458
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4684	1458	1630	4684	3162	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1667	136	159	993	284	383
RTOR Reduction (vph)	0	45	0	0	0	284
Lane Group Flow (vph)	1667	91	159	993	284	99
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	60.1	60.1	18.5	83.6	19.6	19.6
Effective Green, g (s)	60.1	60.1	18.5	83.6	19.6	19.6
Actuated g/C Ratio	0.53	0.53	0.16	0.74	0.17	0.17
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2486	774	266	3459	547	252
v/s Ratio Prot	c0.36		c0.10	0.21	c0.09	
v/s Ratio Perm		0.06				0.07
v/c Ratio	0.67	0.12	0.60	0.29	0.52	0.39
Uniform Delay, d1	19.3	13.3	43.9	4.9	42.5	41.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.1	3.6	0.0	0.8	1.0
Delay (s)	20.1	13.4	47.5	5.0	43.4	42.5
Level of Service	C	B	D	A	D	D
Approach Delay (s)	19.6			10.8	42.9	
Approach LOS	B			B	D	

Intersection Summary			
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	113.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	2	2	49	0	61	5	84	43	172	445	24
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	2	2	53	0	66	5	91	47	187	484	26
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			6									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1026	1007	484	962	986	91	510			138		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1026	1007	484	962	986	91	510			138		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	85	99	100	75	100	93	99			87		
cM capacity (veh/h)	178	209	583	209	215	966	1055			1446		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	32	120	5	91	47	187	484	26
Volume Left	27	53	5	0	0	187	0	0
Volume Right	2	66	0	0	47	0	0	26
cSH	194	370	1055	1700	1700	1446	1700	1700
Volume to Capacity	0.16	0.32	0.01	0.05	0.03	0.13	0.28	0.02
Queue Length 95th (ft)	14	34	0	0	0	11	0	0
Control Delay (s)	27.6	19.3	8.4	0.0	0.0	7.9	0.0	0.0
Lane LOS	D	C	A			A		
Approach Delay (s)	27.6	19.3	0.3			2.1		
Approach LOS	D	C						

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	4	7	46	3	106	3	495	33	103	141	36
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	4	8	50	3	115	3	538	36	112	153	39
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			6									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1039	958	153	928	961	538	192			574		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1039	958	153	928	961	538	192			574		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	86	98	99	77	99	79	100			89		
cM capacity (veh/h)	149	228	893	222	227	543	1381			999		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	33	168	3	538	36	112	153	39
Volume Left	21	50	3	0	0	112	0	0
Volume Right	8	115	0	0	36	0	0	39
cSH	212	373	1381	1700	1700	999	1700	1700
Volume to Capacity	0.15	0.45	0.00	0.32	0.02	0.11	0.09	0.02
Queue Length 95th (ft)	13	57	0	0	0	9	0	0
Control Delay (s)	26.0	22.4	7.6	0.0	0.0	9.1	0.0	0.0
Lane LOS	D	C	A			A		
Approach Delay (s)	26.0	22.4	0.0			3.3		
Approach LOS	D	C						

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		

APPENDIX E

- 2018 Opening Day Plus Project Conditions Analysis Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱↱	↰↰	↑↑↑↑					↰	↰↑	↱↱
Volume (vph)	0	271	80	614	1563	0	0	0	0	348	1	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0					5.0	5.0	5.0
Lane Util. Factor		0.91	0.88	0.97	0.86					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	2787	3433	6408					1681	1686	2787
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	2787	3433	6408					1681	1686	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	295	87	667	1699	0	0	0	0	378	1	35
RTOR Reduction (vph)	0	0	59	0	0	0	0	0	0	0	0	28
Lane Group Flow (vph)	0	295	28	667	1699	0	0	0	0	189	190	7
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		29.0	29.0	27.0	61.0					19.0	19.0	19.0
Effective Green, g (s)		29.0	29.0	27.0	61.0					19.0	19.0	19.0
Actuated g/C Ratio		0.32	0.32	0.30	0.68					0.21	0.21	0.21
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1638	898	1029	4343					354	355	588
v/s Ratio Prot		0.06		c0.19	c0.27					0.11	c0.11	
v/s Ratio Perm			0.01									0.00
v/c Ratio		0.18	0.03	0.65	0.39					0.53	0.54	0.01
Uniform Delay, d1		21.9	20.9	27.4	6.4					31.6	31.6	28.1
Progression Factor		1.00	1.00	0.78	0.54					1.00	1.00	1.00
Incremental Delay, d2		0.2	0.1	1.0	0.2					5.7	5.7	0.0
Delay (s)		22.2	20.9	22.3	3.6					37.2	37.3	28.1
Level of Service		C	C	C	A					D	D	C
Approach Delay (s)		21.9			8.9			0.0			36.5	
Approach LOS		C			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱↱	↰↰	↑↑↑↑					↰	↰↑	↱↱
Volume (vph)	0	474	177	456	1269	0	0	0	0	349	1	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0					5.0	5.0	5.0
Lane Util. Factor		0.91	0.88	0.97	0.86					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	2787	3433	6408					1681	1686	2787
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	2787	3433	6408					1681	1686	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	515	192	496	1379	0	0	0	0	379	1	65
RTOR Reduction (vph)	0	0	126	0	0	0	0	0	0	0	0	50
Lane Group Flow (vph)	0	515	66	496	1379	0	0	0	0	189	191	15
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		31.0	31.0	23.0	59.0					21.0	21.0	21.0
Effective Green, g (s)		31.0	31.0	23.0	59.0					21.0	21.0	21.0
Actuated g/C Ratio		0.34	0.34	0.26	0.66					0.23	0.23	0.23
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1751	959	877	4200					392	393	650
v/s Ratio Prot		0.10		c0.14	c0.22					0.11	c0.11	
v/s Ratio Perm			0.02									0.01
v/c Ratio		0.29	0.07	0.57	0.33					0.48	0.49	0.02
Uniform Delay, d1		21.5	19.8	29.2	6.8					29.8	29.8	26.6
Progression Factor		1.00	1.00	0.84	0.61					1.00	1.00	1.00
Incremental Delay, d2		0.4	0.1	0.7	0.2					4.2	4.3	0.1
Delay (s)		21.9	19.9	25.1	4.3					34.0	34.1	26.7
Level of Service		C	B	C	A					C	C	C
Approach Delay (s)		21.4			9.8			0.0			33.0	
Approach LOS		C			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	31	587	0	0	967	251	1212	0	618	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor	0.97	0.91			0.81	0.81	0.97	0.95	0.95			
Frt	1.00	1.00			0.99	0.85	1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	5085			6001	1282	3433	1504	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	5085			6001	1282	3433	1504	1504			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	638	0	0	1051	273	1317	0	672	0	0	0
RTOR Reduction (vph)	0	0	0	0	6	166	0	52	52	0	0	0
Lane Group Flow (vph)	34	638	0	0	1086	66	1317	284	284	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	2.4	33.0			25.6	25.6	47.0	47.0	47.0			
Effective Green, g (s)	2.4	33.0			25.6	25.6	47.0	47.0	47.0			
Actuated g/C Ratio	0.03	0.37			0.28	0.28	0.52	0.52	0.52			
Clearance Time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	91	1864			1706	364	1792	785	785			
v/s Ratio Prot	0.01	c0.13			c0.18		c0.38	0.19				
v/s Ratio Perm						0.05			0.19			
v/c Ratio	0.37	0.34			0.64	0.18	0.73	0.36	0.36			
Uniform Delay, d1	43.1	20.6			28.1	24.3	16.7	12.7	12.7			
Progression Factor	0.49	0.28			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	2.4	0.5			1.8	1.1	2.7	1.3	1.3			
Delay (s)	23.7	6.2			30.0	25.4	19.4	14.0	14.0			
Level of Service	C	A			C	C	B	B	B			
Approach Delay (s)		7.1			29.2			17.6			0.0	
Approach LOS		A			C			B			A	

Intersection Summary

HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	54	764	0	0	776	428	943	1	928	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor	0.97	0.91			0.81	0.81	0.97	0.95	0.95			
Frt	1.00	1.00			0.97	0.85	1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	5085			5843	1282	3433	1505	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	5085			5843	1282	3433	1505	1504			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	59	830	0	0	843	465	1025	1	1009	0	0	0
RTOR Reduction (vph)	0	0	0	0	53	166	0	32	43	0	0	0
Lane Group Flow (vph)	59	830	0	0	1018	71	1025	475	462	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	3.2	35.0			26.8	26.8	45.0	45.0	45.0			
Effective Green, g (s)	3.2	35.0			26.8	26.8	45.0	45.0	45.0			
Actuated g/C Ratio	0.04	0.39			0.30	0.30	0.50	0.50	0.50			
Clearance Time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	122	1977			1739	381	1716	752	752			
v/s Ratio Prot	0.02	c0.16			c0.17		0.30	c0.32				
v/s Ratio Perm						0.06			0.31			
v/c Ratio	0.48	0.42			0.59	0.19	0.60	0.63	0.61			
Uniform Delay, d1	42.6	20.1			26.9	23.5	16.0	16.4	16.2			
Progression Factor	0.61	0.42			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	2.8	0.6			1.4	1.1	1.5	4.0	3.7			
Delay (s)	28.9	9.2			28.3	24.6	17.6	20.4	20.0			
Level of Service	C	A			C	C	B	C	B			
Approach Delay (s)		10.5			27.6			18.9			0.0	
Approach LOS		B			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	918	288	379	1072	153	66
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4684	1458	1630	4684	3162	1458
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4684	1458	1630	4684	3162	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	998	313	412	1165	166	72
RTOR Reduction (vph)	0	209	0	0	0	62
Lane Group Flow (vph)	998	104	412	1165	166	10
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	35.0	35.0	40.3	80.3	14.6	14.6
Effective Green, g (s)	35.0	35.0	40.3	80.3	14.6	14.6
Actuated g/C Ratio	0.33	0.33	0.38	0.77	0.14	0.14
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1562	486	626	3585	440	202
v/s Ratio Prot	c0.21		c0.25	0.25	c0.05	
v/s Ratio Perm		0.07				0.01
v/c Ratio	0.64	0.21	0.66	0.32	0.38	0.05
Uniform Delay, d1	29.6	25.1	26.6	3.8	41.0	39.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.2	2.5	0.1	0.5	0.1
Delay (s)	30.5	25.3	29.1	3.9	41.6	39.2
Level of Service	C	C	C	A	D	D
Approach Delay (s)	29.2			10.5	40.9	
Approach LOS	C			B	D	

Intersection Summary			
HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	104.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1534	170	159	914	290	352
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4684	1458	1630	4684	3162	1458
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4684	1458	1630	4684	3162	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1667	185	173	993	315	383
RTOR Reduction (vph)	0	61	0	0	0	284
Lane Group Flow (vph)	1667	124	173	993	315	99
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	63.0	63.0	20.0	88.0	20.9	20.9
Effective Green, g (s)	63.0	63.0	20.0	88.0	20.9	20.9
Actuated g/C Ratio	0.53	0.53	0.17	0.74	0.18	0.18
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2481	772	274	3466	555	256
v/s Ratio Prot	c0.36		c0.11	0.21	c0.10	
v/s Ratio Perm		0.09				0.07
v/c Ratio	0.67	0.16	0.63	0.29	0.57	0.39
Uniform Delay, d1	20.4	14.4	46.0	5.1	44.9	43.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.1	4.7	0.0	1.3	1.0
Delay (s)	21.1	14.5	50.7	5.1	46.2	44.3
Level of Service	C	B	D	A	D	D
Approach Delay (s)	20.5			11.9	45.2	
Approach LOS	C			B	D	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	118.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	53	10	6	49	0	61	11	84	43	172	445	77
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	58	11	7	53	0	66	12	91	47	187	484	84
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			6									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1039	1020	484	982	1057	91	567			138		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1039	1020	484	982	1057	91	567			138		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	67	95	99	72	100	93	99			87		
cM capacity (veh/h)	174	204	583	194	194	966	1005			1446		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	75	120	12	91	47	187	484	84
Volume Left	58	53	12	0	0	187	0	0
Volume Right	7	66	0	0	47	0	0	84
cSH	195	348	1005	1700	1700	1446	1700	1700
Volume to Capacity	0.38	0.34	0.01	0.05	0.03	0.13	0.28	0.05
Queue Length 95th (ft)	42	37	1	0	0	11	0	0
Control Delay (s)	35.0	20.7	8.6	0.0	0.0	7.9	0.0	0.0
Lane LOS	D	C	A			A		
Approach Delay (s)	35.0	20.7	0.7			1.9		
Approach LOS	D	C						

Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	48	12	11	46	3	106	9	495	33	103	141	94
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	52	13	12	50	3	115	10	538	36	112	153	102
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			6									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1052	971	153	947	1037	538	255			574		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1052	971	153	947	1037	538	255			574		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	64	94	99	76	98	79	99			89		
cM capacity (veh/h)	145	223	893	207	204	543	1310			999		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	77	168	10	538	36	112	153	102
Volume Left	52	50	10	0	0	112	0	0
Volume Right	12	115	0	0	36	0	0	102
cSH	190	358	1310	1700	1700	999	1700	1700
Volume to Capacity	0.41	0.47	0.01	0.32	0.02	0.11	0.09	0.06
Queue Length 95th (ft)	45	60	1	0	0	9	0	0
Control Delay (s)	36.9	23.6	7.8	0.0	0.0	9.1	0.0	0.0
Lane LOS	E	C	A			A		
Approach Delay (s)	36.9	23.6	0.1			2.8		
Approach LOS	E	C						

Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	30	0	101	30	0	68
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	0	110	33	0	74
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			33		285	33
vC1, stage 1 conf vol					33	
vC2, stage 2 conf vol					252	
vCu, unblocked vol			33		285	33
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			93		100	93
cM capacity (veh/h)			1579		714	1041

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	33	110	33	74
Volume Left	0	110	0	0
Volume Right	0	0	0	74
cSH	1700	1579	1700	1041
Volume to Capacity	0.02	0.07	0.02	0.07
Queue Length 95th (ft)	0	6	0	6
Control Delay (s)	0.0	7.4	0.0	8.7
Lane LOS		A		A
Approach Delay (s)	0.0	5.7		8.7
Approach LOS				A

Intersection Summary			
Average Delay	5.9		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	31	0	109	42	0	71
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	34	0	118	46	0	77
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			34		316	34
vC1, stage 1 conf vol					34	
vC2, stage 2 conf vol					283	
vCu, unblocked vol			34		316	34
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			92		100	93
cM capacity (veh/h)			1578		688	1040

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	34	118	46	77
Volume Left	0	118	0	0
Volume Right	0	0	0	77
cSH	1700	1578	1700	1040
Volume to Capacity	0.02	0.08	0.03	0.07
Queue Length 95th (ft)	0	6	0	6
Control Delay (s)	0.0	7.5	0.0	8.7
Lane LOS		A		A
Approach Delay (s)	0.0	5.4		8.7
Approach LOS				A

Intersection Summary			
Average Delay	5.7		
Intersection Capacity Utilization	23.8%	ICU Level of Service	A
Analysis Period (min)	15		