BARRIER NOISE REDUCTION ANALYSIS,WALL HEIGHT VARIABLE

REFERENCE VEHICLE LEVELS AT 50 FEET

AUTO.....= 79.97
M.TRUCK.....= 72.26
H.TRUCK.....= 77.37

PROJECT.....COURTYARD & TOWNPLACE SUITES
DESCRIPTION..ROOF DECK SHIELDING
SOURCE ELEVATION..... 10
RECEIVER ELEVATION..... 30
BARRIER ELEVATION..... 0
RECEIVER HEIGHT..... 5
DISTANCE TO SOURCE..... 250
DISTANCE TO RECEIVER... 175
AUTO NOISE LEVEL..... 70.67581
M.TRK NOISE LEVEL..... 62.96582
H.TRK NOISE LEVEL..... 68.07581
SOURCE NOISE LEVEL..... 73.03

ANGULAR CORRECTION(DB) - 0

WALL HEIGHT	ANL	MTNL	HTNL	TNL	TIL
35.00	62.60	55.23	61.34	65.46	7.57
FN	0.5058	0.4317	0.2359		

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 DOUBLE QUEEN + STC = 24

FLOOR AREA 250

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		76	0.00760
EXT.WALL 2	43		24	0.00120
EXT.WALL 3	50		0	0.00000
INT.WALL			389	
WINDOW 1	22	.05	31	0.19560
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	45	.04	250	0.00791
FLOOR		.6	250	
ET*S				0.21231
-10LOG(ET*S)				6.7
10LOGA				22.6
NOISE REDUCTION				23.3

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME DOUBLE QUEEN + STC = 26

FLOOR AREA 250

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		76	0.00760
EXT.WALL 2	43		24	0.00120
EXT.WALL 3	50		0	0.00000
INT.WALL			389	
WINDOW 1	24	.05	31	0.12341
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	45	.04	250	0.00791
FLOOR		.6	250	
ET*S				0.14012
-10LOG(ET*S)				8.5
10LOGA				22.6
NOISE REDUCTION				25.1

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME DOUBLE QUEEN + STC = 28

FLOOR AREA 250

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		76	0.00760
EXT.WALL 2	43		24	0.00120
EXT.WALL 3	50		0	0.00000
INT.WALL			389	
WINDOW 1	26	.05	31	0.07787
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	45	.04	250	0.00791
FLOOR		.6	250	
ET*S				0.09458
-10LOG(ET*S)				10.2
10LOGA				22.6
NOISE REDUCTION				26.8

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME DOUBLE QUEEN + STC = 30

FLOOR AREA 250

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		76	0.00760
EXT.WALL 2	43		24	0.00120
EXT.WALL 3	50		0	0.00000
INT.WALL			389	
WINDOW 1	28	.05	31	0.04913
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	45	.04	250	0.00791
FLOOR		.6	250	
ET*S				0.06584
-10LOG(ET*S)				11.8
10LOGA				22.6
NOISE REDUCTION				28.4

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME DOUBLE QUEEN + STC = 32

FLOOR AREA 250

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		76	0.00760
EXT.WALL 2	43		24	0.00120
EXT.WALL 3	50		0	0.00000
INT.WALL			389	
WINDOW 1	30	.05	31	0.03100
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	45	.04	250	0.00791
FLOOR		.6	250	
ET*S				0.04771
-10LOG(ET*S)				13.2
10LOGA				22.6
NOISE REDUCTION				29.8

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME DOUBLE QUEEN + STC = 34

FLOOR AREA 250

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		76	0.00760
EXT.WALL 2	43		24	0.00120
EXT.WALL 3	50		0	0.00000
INT.WALL			389	
WINDOW 1	32	.05	31	0.01956
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	45	.04	250	0.00791
FLOOR		.6	250	
ET*S				0.03627
-10LOG(ET*S)				14.4
10LOGA				22.6
NOISE REDUCTION				31.0

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME DOUBLE QUEEN + STC = 36

FLOOR AREA 250

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		76	0.00760
EXT.WALL 2	43		24	0.00120
EXT.WALL 3	50		0	0.00000
INT.WALL			389	
WINDOW 1	34	.05	31	0.01234
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	45	.04	250	0.00791
FLOOR		.6	250	
ET*S				0.02905
-10LOG(ET*S)				15.4
10LOGA				22.6
NOISE REDUCTION				31.9

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME DOUBLE QUEEN + STC = 38

FLOOR AREA 250

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		76	0.00760
EXT.WALL 2	43		24	0.00120
EXT.WALL 3	50		0	0.00000
INT.WALL			389	
WINDOW 1	36	.05	31	0.00779
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	45	.04	250	0.00791
FLOOR		.6	250	
ET*S				0.02450
-10LOG(ET*S)				16.1
10LOGA				22.6
NOISE REDUCTION				32.7

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME KING + STC = 24

FLOOR AREA 208

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		73	0.00730
EXT.WALL 2	43		0	0.00000
EXT.WALL 3	50		0	0.00000
INT.WALL			363	
WINDOW 1	22	.05	31	0.19560
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	45	.04	208	0.00658
FLOOR		.6	208	
ET*S				0.20947
-10LOG(ET*S)				6.8
10LOGA				21.9
NOISE REDUCTION				22.6

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME KING + STC = 26

FLOOR AREA 208

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		73	0.00730
EXT.WALL 2	43		0	0.00000
EXT.WALL 3	50		0	0.00000
INT.WALL			363	
WINDOW 1	24	.05	31	0.12341
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	45	.04	208	0.00658
FLOOR		.6	208	
ET*S				0.13729
-10LOG(ET*S)				8.6
10LOGA				21.9
NOISE REDUCTION				24.5

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME KING + STC = 28

FLOOR AREA 208

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		73	0.00730
EXT.WALL 2	43		0	0.00000
EXT.WALL 3	50		0	0.00000
INT.WALL			363	
WINDOW 1	26	.05	31	0.07787
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	45	.04	208	0.00658
FLOOR		.6	208	
ET*S				0.09175
-10LOG(ET*S)				10.4
10LOGA				21.9
NOISE REDUCTION				26.2

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME KING + STC = 30

FLOOR AREA 208

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		73	0.00730
EXT.WALL 2	43		0	0.00000
EXT.WALL 3	50		0	0.00000
INT.WALL			363	
WINDOW 1	28	.05	31	0.04913
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	45	.04	208	0.00658
FLOOR		.6	208	
ET*S				0.06301
-10LOG(ET*S)				12.0
10LOGA				21.9
NOISE REDUCTION				27.9

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME KING + STC = 32

FLOOR AREA 208

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		73	0.00730
EXT.WALL 2	43		0	0.00000
EXT.WALL 3	50		0	0.00000
INT.WALL			363	
WINDOW 1	30	.05	31	0.03100
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	45	.04	208	0.00658
FLOOR		.6	208	
ET*S				0.04488
-10LOG(ET*S)				13.5
10LOGA				21.9
NOISE REDUCTION				29.3

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME KING + STC = 34

FLOOR AREA 208

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		73	0.00730
EXT.WALL 2	43		0	0.00000
EXT.WALL 3	50		0	0.00000
INT.WALL			363	
WINDOW 1	32	.05	31	0.01956
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	45	.04	208	0.00658
FLOOR		.6	208	
ET*S				0.03344
-10LOG(ET*S)				14.8
10LOGA				21.9
NOISE REDUCTION				30.6

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME KING + STC = 36

FLOOR AREA 208

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		73	0.00730
EXT.WALL 2	43		0	0.00000
EXT.WALL 3	50		0	0.00000
INT.WALL			363	
WINDOW 1	34	.05	31	0.01234
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	45	.04	208	0.00658
FLOOR		.6	208	
ET*S				0.02622
-10LOG(ET*S)				15.8
10LOGA				21.9
NOISE REDUCTION				31.7

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME KING + STC = 38

FLOOR AREA 208

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		73	0.00730
EXT.WALL 2	43		0	0.00000
EXT.WALL 3	50		0	0.00000
INT.WALL			363	
WINDOW 1	36	.05	31	0.00779
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	45	.04	208	0.00658
FLOOR		.6	208	
ET*S				0.02166
-10LOG(ET*S)				16.6
10LOGA				21.9
NOISE REDUCTION				32.5

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME ONE BEDROOM + STC = 24

FLOOR AREA 127

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		72	0.00720
EXT.WALL 2	43		76	0.00381
EXT.WALL 3	50		0	0.00000
INT.WALL			180	
WINDOW 1	22	.05	24	0.15143
WINDOW 2	25	.05	15	0.04743
WINDOW 3	32	.05	0	0.00000
SGD	22	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	45	.04	127	0.00402
FLOOR		.6	127	
ET*S				0.21389
-10LOG(ET*S)				6.7
10LOGA				19.7
NOISE REDUCTION				20.4

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME ONE BEDROOM + STC = 26

FLOOR AREA 127

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		72	0.00720
EXT.WALL 2	43		76	0.00381
EXT.WALL 3	50		0	0.00000
INT.WALL			180	
WINDOW 1	24	.05	24	0.09555
WINDOW 2	27	.05	15	0.02993
WINDOW 3	34	.05	0	0.00000
SGD	24	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	45	.04	127	0.00402
FLOOR		.6	127	
ET*S				0.14050
-10LOG(ET*S)				8.5
10LOGA				19.7
NOISE REDUCTION				22.2

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME ONE BEDROOM + STC = 28

FLOOR AREA 127

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		72	0.00720
EXT.WALL 2	43		76	0.00381
EXT.WALL 3	50		0	0.00000
INT.WALL			180	
WINDOW 1	26	.05	24	0.06029
WINDOW 2	29	.05	15	0.01888
WINDOW 3	36	.05	0	0.00000
SGD	26	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	45	.04	127	0.00402
FLOOR		.6	127	
ET*S				0.09419
-10LOG(ET*S)				10.3
10LOGA				19.7
NOISE REDUCTION				24.0

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME ONE BEDROOM + STC = 30

FLOOR AREA 127

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		72	0.00720
EXT.WALL 2	43		76	0.00381
EXT.WALL 3	50		0	0.00000
INT.WALL			180	
WINDOW 1	28	.05	24	0.03804
WINDOW 2	31	.05	15	0.01191
WINDOW 3	38	.05	0	0.00000
SGD	28	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	45	.04	127	0.00402
FLOOR		.6	127	
ET*S				0.06498
-10LOG(ET*S)				11.9
10LOGA				19.7
NOISE REDUCTION				25.6

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME ONE BEDROOM + STC = 32

FLOOR AREA 127

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		72	0.00720
EXT.WALL 2	43		76	0.00381
EXT.WALL 3	50		0	0.00000
INT.WALL			180	
WINDOW 1	30	.05	24	0.02400
WINDOW 2	33	.05	15	0.00752
WINDOW 3	40	.05	0	0.00000
SGD	30	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	45	.04	127	0.00402
FLOOR		.6	127	
ET*S				0.04654
-10LOG(ET*S)				13.3
10LOGA				19.7
NOISE REDUCTION				27.0

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME ONE BEDROOM + STC = 34

FLOOR AREA 127

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		72	0.00720
EXT.WALL 2	43		76	0.00381
EXT.WALL 3	50		0	0.00000
INT.WALL			180	
WINDOW 1	32	.05	24	0.01514
WINDOW 2	35	.05	15	0.00474
WINDOW 3	42	.05	0	0.00000
SGD	32	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	45	.04	127	0.00402
FLOOR		.6	127	
ET*S				0.03491
-10LOG(ET*S)				14.6
10LOGA				19.7
NOISE REDUCTION				28.3

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME ONE BEDROOM + STC = 36

FLOOR AREA 127

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		72	0.00720
EXT.WALL 2	43		76	0.00381
EXT.WALL 3	50		0	0.00000
INT.WALL			180	
WINDOW 1	34	.05	24	0.00955
WINDOW 2	37	.05	15	0.00299
WINDOW 3	44	.05	0	0.00000
SGD	34	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	45	.04	127	0.00402
FLOOR		.6	127	
ET*S				0.02757
-10LOG(ET*S)				15.6
10LOGA				19.7
NOISE REDUCTION				29.3

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME ONE BEDROOM + STC = 38

FLOOR AREA 127

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		72	0.00720
EXT.WALL 2	43		76	0.00381
EXT.WALL 3	50		0	0.00000
INT.WALL			180	
WINDOW 1	36	.05	24	0.00603
WINDOW 2	39	.05	15	0.00189
WINDOW 3	46	.05	0	0.00000
SGD	36	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	45	.04	127	0.00402
FLOOR		.6	127	
ET*S				0.02294
-10LOG(ET*S)				16.4
10LOGA				19.7
NOISE REDUCTION				30.1

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME STUDIO + STC = 24

FLOOR AREA 187

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		92	0.00920
EXT.WALL 2	43		101	0.00506
EXT.WALL 3	50		0	0.00000
INT.WALL			219	
WINDOW 1	22	.05	31	0.19560
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	45	.04	187	0.00591
FLOOR		.6	187	
ET*S				0.21577
-10LOG(ET*S)				6.7
10LOGA				21.3
NOISE REDUCTION				22.0

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME STUDIO + STC = 26

FLOOR AREA 187

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		92	0.00920
EXT.WALL 2	43		101	0.00506
EXT.WALL 3	50		0	0.00000
INT.WALL			219	
WINDOW 1	24	.05	31	0.12341
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	45	.04	187	0.00591
FLOOR		.6	187	
ET*S				0.14359
-10LOG(ET*S)				8.4
10LOGA				21.3
NOISE REDUCTION				23.7

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME STUDIO + STC = 28

FLOOR AREA 187

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		92	0.00920
EXT.WALL 2	43		101	0.00506
EXT.WALL 3	50		0	0.00000
INT.WALL			219	
WINDOW 1	26	.05	31	0.07787
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	45	.04	187	0.00591
FLOOR		.6	187	
ET*S				0.09804
-10LOG(ET*S)				10.1
10LOGA				21.3
NOISE REDUCTION				25.4

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME STUDIO + STC = 30

FLOOR AREA 187

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		92	0.00920
EXT.WALL 2	43		101	0.00506
EXT.WALL 3	50		0	0.00000
INT.WALL			219	
WINDOW 1	28	.05	31	0.04913
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	45	.04	187	0.00591
FLOOR		.6	187	
ET*S				0.06931
-10LOG(ET*S)				11.6
10LOGA				21.3
NOISE REDUCTION				26.9

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME STUDIO + STC = 32

FLOOR AREA 187

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		92	0.00920
EXT.WALL 2	43		101	0.00506
EXT.WALL 3	50		0	0.00000
INT.WALL			219	
WINDOW 1	30	.05	31	0.03100
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	45	.04	187	0.00591
FLOOR		.6	187	
ET*S				0.05118
-10LOG(ET*S)				12.9
10LOGA				21.3
NOISE REDUCTION				28.2

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME STUDIO + STC = 34

FLOOR AREA 187

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		92	0.00920
EXT.WALL 2	43		101	0.00506
EXT.WALL 3	50		0	0.00000
INT.WALL			219	
WINDOW 1	32	.05	31	0.01956
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	45	.04	187	0.00591
FLOOR		.6	187	
ET*S				0.03974
-10LOG(ET*S)				14.0
10LOGA				21.3
NOISE REDUCTION				29.3

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME STUDIO + STC = 36

FLOOR AREA 187

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		92	0.00920
EXT.WALL 2	43		101	0.00506
EXT.WALL 3	50		0	0.00000
INT.WALL			219	
WINDOW 1	34	.05	31	0.01234
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	45	.04	187	0.00591
FLOOR		.6	187	
ET*S				0.03252
-10LOG(ET*S)				14.9
10LOGA				21.3
NOISE REDUCTION				30.2

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME STUDIO + STC = 38

FLOOR AREA 187

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		92	0.00920
EXT.WALL 2	43		101	0.00506
EXT.WALL 3	50		0	0.00000
INT.WALL			219	
WINDOW 1	36	.05	31	0.00779
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	45	.04	187	0.00591
FLOOR		.6	187	
ET*S				0.02796
-10LOG(ET*S)				15.5
10LOGA				21.3
NOISE REDUCTION				30.8

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME ONE BEDROOM + UPGRADED WALLS + STC = 24

FLOOR AREA 127

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		72	0.00072
EXT.WALL 2	53		76	0.00038
EXT.WALL 3	60		0	0.00000
INT.WALL			180	
WINDOW 1	22	.05	24	0.15143
WINDOW 2	25	.05	15	0.04743
WINDOW 3	32	.05	0	0.00000
SGD	22	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	45	.04	127	0.00402
FLOOR		.6	127	
ET*S				0.20398
-10LOG(ET*S)				6.9
10LOGA				19.7
NOISE REDUCTION				20.6

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME ONE BEDROOM + UPGRADED WALLS + STC = 26

FLOOR AREA 127

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		72	0.00072
EXT.WALL 2	53		76	0.00038
EXT.WALL 3	60		0	0.00000
INT.WALL			180	
WINDOW 1	24	.05	24	0.09555
WINDOW 2	27	.05	15	0.02993
WINDOW 3	34	.05	0	0.00000
SGD	24	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	45	.04	127	0.00402
FLOOR		.6	127	
ET*S				0.13059
-10LOG(ET*S)				8.8
10LOGA				19.7
NOISE REDUCTION				22.6

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME ONE BEDROOM + UPGRADED WALLS + STC = 28

FLOOR AREA 127

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		72	0.00072
EXT.WALL 2	53		76	0.00038
EXT.WALL 3	60		0	0.00000
INT.WALL			180	
WINDOW 1	26	.05	24	0.06029
WINDOW 2	29	.05	15	0.01888
WINDOW 3	36	.05	0	0.00000
SGD	26	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	45	.04	127	0.00402
FLOOR		.6	127	
ET*S				0.08429
-10LOG(ET*S)				10.7
10LOGA				19.7
NOISE REDUCTION				24.5

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME ONE BEDROOM + UPGRADED WALLS + STC = 30

FLOOR AREA 127

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		72	0.00072
EXT.WALL 2	53		76	0.00038
EXT.WALL 3	60		0	0.00000
INT.WALL			180	
WINDOW 1	28	.05	24	0.03804
WINDOW 2	31	.05	15	0.01191
WINDOW 3	38	.05	0	0.00000
SGD	28	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	45	.04	127	0.00402
FLOOR		.6	127	
ET*S				0.05507
-10LOG(ET*S)				12.6
10LOGA				19.7
NOISE REDUCTION				26.3

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME ONE BEDROOM + UPGRADED WALLS + STC = 32

FLOOR AREA 127

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		72	0.00072
EXT.WALL 2	53		76	0.00038
EXT.WALL 3	60		0	0.00000
INT.WALL			180	
WINDOW 1	30	.05	24	0.02400
WINDOW 2	33	.05	15	0.00752
WINDOW 3	40	.05	0	0.00000
SGD	30	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	45	.04	127	0.00402
FLOOR		.6	127	
ET*S				0.03663
-10LOG(ET*S)				14.4
10LOGA				19.7
NOISE REDUCTION				28.1

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME ONE BEDROOM + UPGRADED WALLS + STC = 34

FLOOR AREA 127

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		72	0.00072
EXT.WALL 2	53		76	0.00038
EXT.WALL 3	60		0	0.00000
INT.WALL			180	
WINDOW 1	32	.05	24	0.01514
WINDOW 2	35	.05	15	0.00474
WINDOW 3	42	.05	0	0.00000
SGD	32	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	45	.04	127	0.00402
FLOOR		.6	127	
ET*S				0.02500
-10LOG(ET*S)				16.0
10LOGA				19.7
NOISE REDUCTION				29.7

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME ONE BEDROOM + UPGRADED WALLS + STC = 36

FLOOR AREA 127

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		72	0.00072
EXT.WALL 2	53		76	0.00038
EXT.WALL 3	60		0	0.00000
INT.WALL			180	
WINDOW 1	34	.05	24	0.00955
WINDOW 2	37	.05	15	0.00299
WINDOW 3	44	.05	0	0.00000
SGD	34	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	45	.04	127	0.00402
FLOOR		.6	127	
ET*S				0.01766
-10LOG(ET*S)				17.5
10LOGA				19.7
NOISE REDUCTION				31.2

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME ONE BEDROOM + UPGRADED WALLS + STC = 38

FLOOR AREA 127

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		72	0.00072
EXT.WALL 2	53		76	0.00038
EXT.WALL 3	60		0	0.00000
INT.WALL			180	
WINDOW 1	36	.05	24	0.00603
WINDOW 2	39	.05	15	0.00189
WINDOW 3	46	.05	0	0.00000
SGD	36	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	45	.04	127	0.00402
FLOOR		.6	127	
ET*S				0.01303
-10LOG(ET*S)				18.8
10LOGA				19.7
NOISE REDUCTION				32.6

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APPENDIX 6

PLUMBING AND ELECTRICAL INSTALLATIONS

P. O. BOX 2325 • FULLERTON, CALIFORNIA • 92837
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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

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(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**.

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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.

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CHRISTOPHER JEAN & ASSOCIATES, INC.
ACOUSTICAL CONSULTING SERVICES

November 19, 2015

MR. PETER J. KRUSE
KRUSE DEVELOPMENT SERVICES
3247 Sitio Oceano
Carlsbad, California 92009

SUBJECT: PLAN CHECK COMMENT RESPONSES -- ACOUSTICAL ANALYSIS COURTYARD & TOWNEPLACE SUITES -- CITY OF AGOURA HILLS

Dear Mr. Kruse:

The City's Plan Check comments for the Acoustical Analysis 15/086 prepared for the Courtyard & Towneplace Suites project located on Agoura Road in teh City of Agoura Hills have been reviewed. The responses are as follows.

Reviewer Comment:

Page 8, Section 3.4 says that dog barking noise is less than freeway noise, so "project exterior noise impacts will be defined by the roadway noise alone." Yet, animal barking noise can be more disturbing than freeway noise, so this ambient condition needs to be addressed for the project site.

Response:

The City of Agoura Hills defines environmental noise impacts upon this project using the Community Noise Equivalent Level (CNEL). This is a time penalized 24-hour average noise level designed to account for increased sensitivity to noise during the evening and nighttime sleeping hours. It is not based on individual noise events, although such events, if

frequent enough during a 24 hour period, can contribute to the CNEL value. The project site and surrounding areas are dominated by the noise from the freeway which is nearly constant and already at levels higher than the barking dog sounds observed during the site visit. Future freeway noise levels, as examined in the analysis will be even higher. Interior noise mitigation designed to reduce the future freeway noise will also reduce animal noises an equal amount on the interior of the project building.

To illustrate why dog barking does not significantly add to the noise impacts on the project, let's postulate the scenario that the animal shelter produces a worst-case 5,000 barks of one second duration in a 24-hour period with barking noise levels as high as 80 dBA at the common property line (dog barking levels observed during the site visit were not this high). If 60% of the barking occurs during the day, 10% occurs in the evening, and the remaining 30% occurs at night, the resulting CNEL value of the dog barking at the common property would be 74 dBA CNEL. Projecting this worst-case level out to the nearest project building face at a rate of -6 dBA per doubling of distance reduces this level to only 65 dBA CNEL which is well below the 70-73 dBA CNEL freeway noise levels along this same building face. To claim that the lesser noise levels from barking dogs would be more disturbing than the 5 to 8 dBA higher noise levels produced by passing heavy trucks, Jake brakes, motorcycles and horns is simply incorrect. Since the project mitigation designed to reduce the freeway noise levels to 45 dBA CNEL will also reduce the noise of barking dogs by an equal amount, the issue is adequately addressed by the required interior noise mitigation.

Reviewer Comment:

Page 9 says the "Agoura Road forecast traffic volume was obtained by applying a ten year traffic projection, at a growth rate of two percent per year, to the existing traffic volume published by the Traffic Engineering Department of the City of Agoura Hills..." Please state how this information was obtained.

Response:

This statement in the acoustical report has been revised to read, "The Agoura Road future forecast traffic volume was estimated by applying a ten-year traffic projection, at a growth rate of two percent per year, to the existing traffic volume published in the document titled: City of Agoura Hills Final Report for the 2011 Engineering And Traffic Survey To Establish Speed Limits."

The above document was found on the Traffic Engineering Department's page of the City of Agoura Hills web site. This document states the existing traffic volume on the segment of Agoura Road between Ladyface Court and Kanan Road is 9,316 ADT. Thus, the future traffic volume was estimated at 11,350 ADT.

Reviewer Comment:

The acoustic analysis should also consider construction impacts to animals at the County Animal shelter. The report should incorporate short term mitigation measures to minimize impacts to the animals.

Response:

A section discussing construction phase noise impacts and possible mitigation measures has been added to the revised acoustical report. This section recommends creating a temporary noise barrier by attaching plywood panels to the existing property line fence and/or locating construction office and storage trailers/containers along the property line to shield the animal shelter property from construction noise. Several operational measures are also included.

Reviewer Comment:

Additionally, the Project Disclosure on page 16 of the report suggests that there will still be noise audible inside the hotel rooms with construction techniques incorporated. Could the impact be reduced even further to reach an acceptable level of comfort inside, especially on the north elevation of the building facing the freeway?

Response:

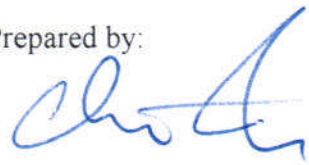
The disclaimer statement is included as a means of protecting this consultant, the project builder, the project owner, and the City of Agoura Hills from frivolous lawsuits initiated by people who do not understanding the limitations of sound mitigation. To the general public, the term "soundproofed" means silence, a condition that nobody but a totally deaf person can ever claim to have experienced. Even if a particular noise environment could be mitigated to approach silence, we would never experience actual silence because we start to hear our own bodily functions once the noise environment is reduced to around 25 dBA.

The Uniform Building Code already defines a level of 45 dBA CNEL to be an acceptable interior noise environment for residential structures, including sleeping rooms. The proposed project construction with the required interior noise mitigation incorporated will provide 31 dBA of exterior to interior noise reduction along the north face of the project building. This will be sufficient to comply with the 45 dBA CNEL UBC interior standard.

The reason that exterior noise sources will remain audible inside the hotel guest rooms is that the 45 dBA CNEL standard is based on average noise levels, not maximum levels. Thus, individual noise events such as a single motorcycle pass-by could produce levels inside the building higher than 45 dBA and would probably be audible inside the building. The fact that certain noise sources will remain audible is not a failure on the part of the building design or noise mitigation measures. It is simply a reality that all parties need to understand and accept.

Thank you, and if there are any questions, please do not hesitate to contact me.

Prepared by:



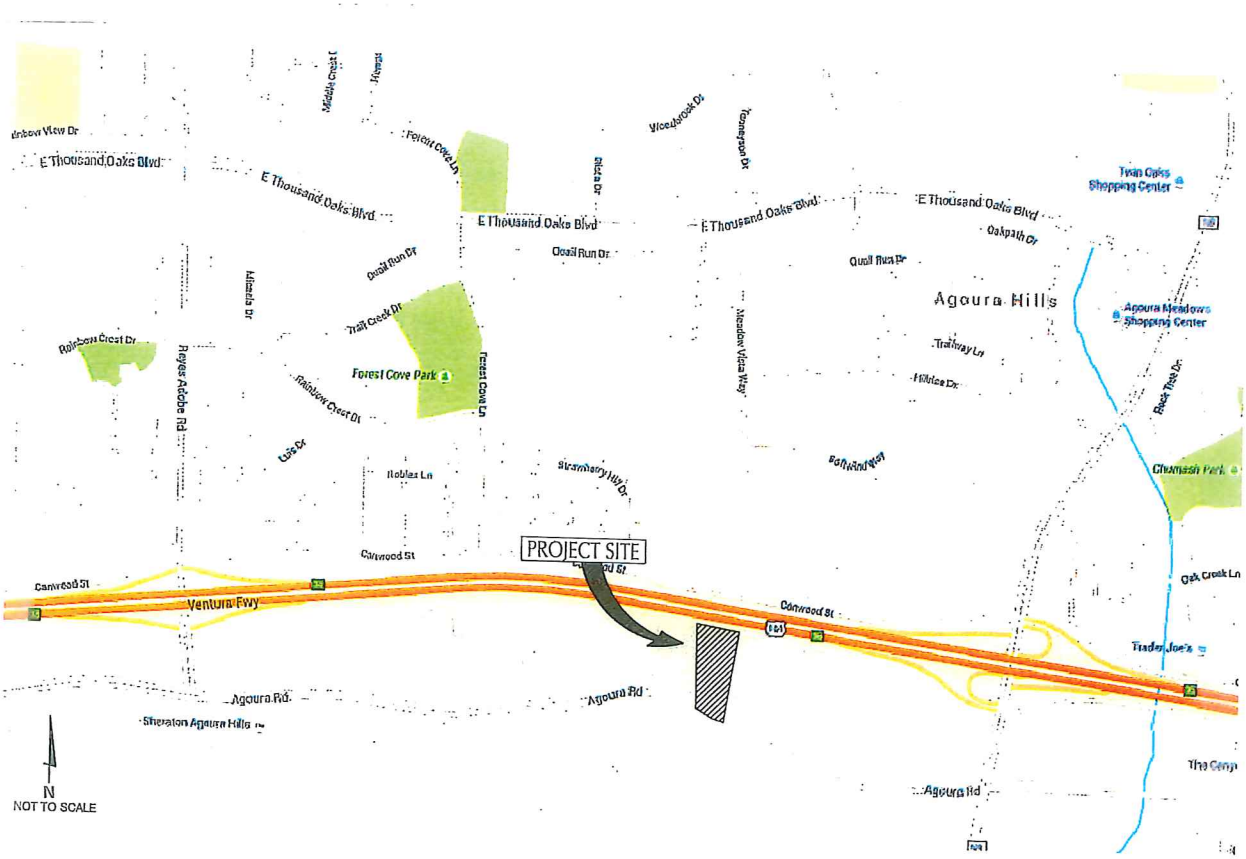
Christopher Jean
President

Appendix L

Traffic Study

COURTYARD & TOWNEPLACE SUITES HOTEL PROJECT
CITY OF AGOURA HILLS, CALIFORNIA

REVISED TRAFFIC AND CIRCULATION STUDY



November 30, 2015

ATE Project #15068

Prepared for:

Kruse Development Services Group Inc.
3247 Sitio Oceano
Carlsbad, CA 92009

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Since 1978

Richard L. Pool, P.E.
Scott A. Schell, AICP, PTP

November 30, 2015

15068R02.WPD

Mr. Peter Kruse
Kruse Development Services Group Inc.
3247 Sitio Oceano
Carlsbad, CA 92009

REVISED TRAFFIC AND CIRCULATION STUDY FOR THE COURTYARD & TOWNEPLACE SUITES HOTEL PROJECT, CITY OF AGOURA HILLS, CALIFORNIA

Associated Transportation Engineers (ATE) has prepared the following revised traffic and circulation study for the Courtyard & TownePlace Suites Hotel Project, proposed in the City of Agoura Hills. The study addresses the November 4th 2015 comments proved by City staff.

We appreciate the opportunity to assist you with this project.

Associated Transportation Engineers

Scott A. Schell, AICP, PTP
Principal Transportation Planner

CONTENTS

TABLES

FIGURES

INTRODUCTION

The following traffic and circulation study contains an analysis of the potential traffic impacts associated with the Courtyard & TownePlace Suites Hotel Project. The study provides information regarding existing and future traffic conditions within the project study-area and recommends improvements where necessary. The study also provides an analysis of the project's consistency with the policies outlined in the Los Angeles County Congestion Management Program (CMP).

PROJECT DESCRIPTION

The Courtyard & TownePlace Hotel Suites Project is located on Agoura Road just west of the Agoura Road/Roadside Road intersection in the City of Agoura Hills. The project is proposing to develop a 225 room hotel. Figure 1 shows the location of the project site within the City of Agoura Hills. Regional access to U.S. Highway 101 is provided via the Reyes Adobe Road and Kanan Road interchanges. Primary access to the site is proposed via a right-turn in/out only driveway on Agoura Road. Secondary access is provided via a driveway connection to Roadside Drive at the northeast corner of the project. Access to Roadside Road will be provided via a cross-access through the adjacent proposed LA Fitness property to the east. Figure 2 illustrates the project site plan.

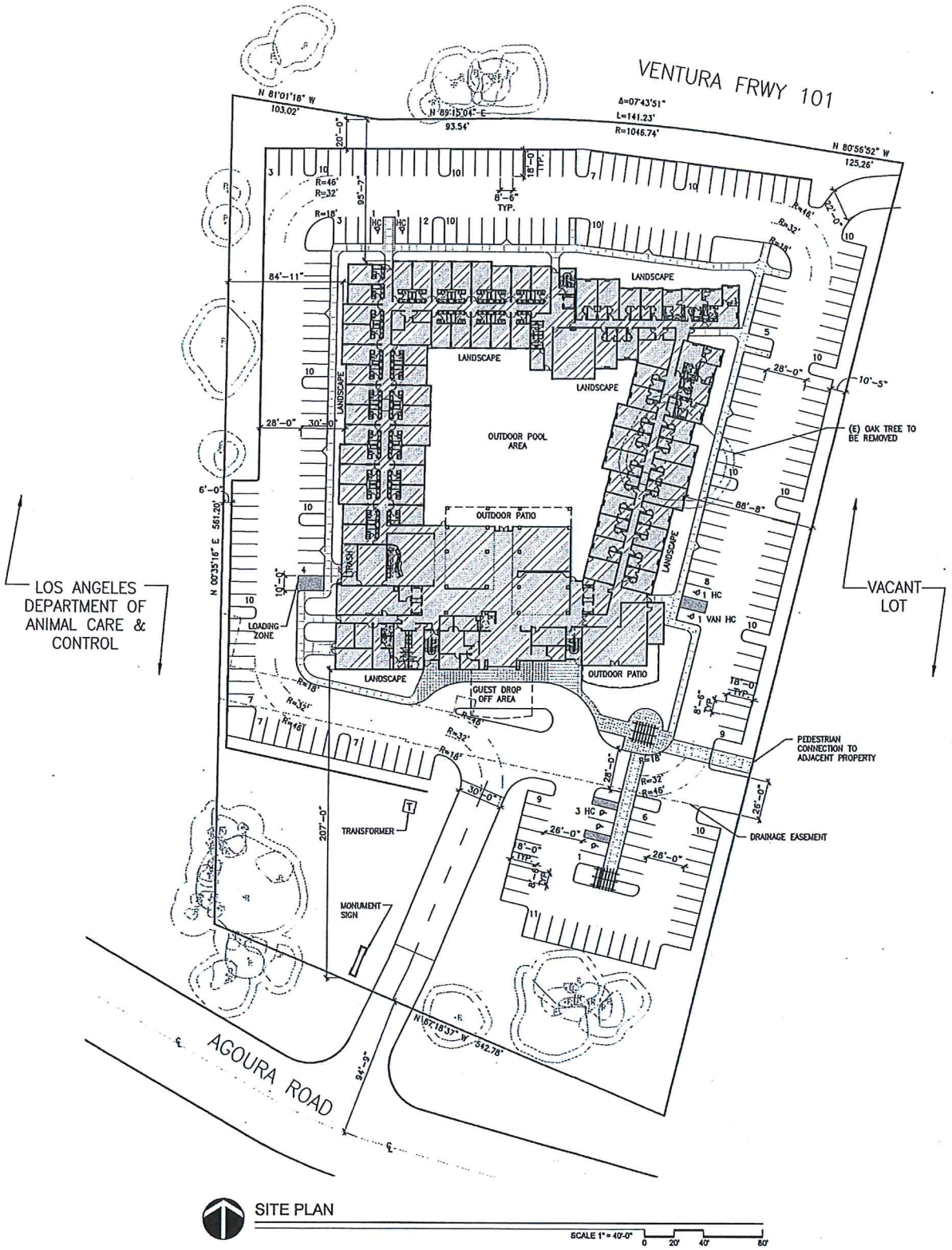
EXISTING CONDITIONS

Street Network

The project site is served by a network of highways, arterial roads and collector streets as illustrated in Figure 1. The following text provides a brief description of the major components of the study-area street network.

U.S. Highway 101, located north of the project site, is a multi-lane interstate highway serving the Pacific coast between the City of Los Angeles and the State of Washington. U.S. Highway 101 is the principal route between the City of Agoura Hills and the adjacent cities of Thousand Oaks and Westlake Village to the north, and the cities of Calabasas, Hidden Hills, and Los Angeles to the south. Access between the site and U.S. Highway 101 is provided via the Reyes Adobe Road and Kanan Road interchanges. The ramp intersections at the Reyes Adobe Road and Kanan Road interchanges are controlled by traffic signals.

Reyes Adobe Road, located west of the project site, is a 2- to 4-lane north-south arterial roadway that extends north from Agoura Road to the YMCA located off of Lake Lindero Drive. The roadway provides a primary north-south surface street route through the City of Agoura Hills. Within the study-area, Reyes Adobe Road is signalized at the U.S. Highway 101 interchange, Canwood Street and at the Agoura Road intersections.



Associated Transportation Engineers

PROJECT SITE PLAN

FIGURE 2

MMF - #15068

Kanan Road, located east of the project site, is a 4-lane arterial roadway that extends south from Tamarind Street and intersects with U.S. Highway 101 and Agoura Road before entering into Los Angeles County at the southern City limits. The roadway provides a primary north-south surface street route through the City of Agoura Hills. Within the study-area, Kanan Road is signalized at the U.S. Highway 101 interchange, Canwood Street and at the Agoura Road intersections.

Agoura Road, located along the project's southern frontage, is a 2- to 4-lane east-west arterial roadway that extends between Las Virgenes Road on the east and South Westlake Boulevard on the west. Within the study-area, the Agoura Road/Reyes Adobe Road, Ladyface Circle, and Kanan Road intersections are controlled by traffic signals. The Agoura Road/Roadside Road and Agoura Road/Cornell Road intersections are STOP-sign controlled. Access to the project site will be provided via a right-turn in/out only driveway located on Agoura Road. The 2-lane undivided section of Agoura Road adjacent to the project site from Ladyface Circle to Kanan Road is currently being widened to a 4-lane divided section with sidewalk and bike lanes in each direction.

Canwood Street, is an east-west arterial roadway which serves as a frontage road on the north side of U.S. Highway 101. Canwood Street originates at Lake Crest Drive and extends east to Chesebro-Driver-Palo Comado Canyon Road. It serves local businesses east of Kanan Road and residential neighborhoods west of Kanan Road. The Kanan Road/Canwood Street intersection is signalized.

Cornell Road, located east of the project, is a 2-lane north-south collector street that extends south from the intersection of Roadside Drive through the intersection of Agoura Road and beyond the City limits into Los Angeles County. The intersection of Agoura Road/Cornell Road is All-Way STOP-sign controlled.

Ladyface Circle, located west of the project site, is a 2-lane north-south street that extends south from Agoura Road to provide access to City Hall and additional commercial office uses. The Agoura Road/Ladyface Circle intersection is signalized.

Roadside Road, located east of the project site, is a 2-lane north-south street that extends north from Agoura Road to Roadside Drive. The Agoura Road/Roadside Road intersection is STOP-sign controlled on Roadside Road. Roadside Road will provide secondary access to the project site via a cross-access with the adjacent LA Fitness property.

Roadside Drive, located north of the project site, is a 2-lane east-west collector street that extends west from the shopping center located in the southwest quadrant of the U.S. Highway 101 Southbound Off-Ramp/Kanan Road intersection to the project site. Roadside Drive will provide secondary access to the project site.

Roadway Operations

The following section reviews the operation of Agoura Road in the study-area. The operational characteristics of the roadway are analyzed based on the 2010 Highway Capacity Manual (HCM) [1] methodology for multi-lane highways. In rating a roadway's operating condition, "Levels of Service" (LOS) "A" through "F" are used. LOS "A" and LOS "B" represent primarily free-flow operations, LOS "C" represents stable conditions, LOS "D" nears unstable operations with restrictions on maneuverability within traffic streams, LOS "E" represents unstable operations with maneuverability very limited, and LOS "F" represents breakdown or forced flow conditions (more complete definitions of levels of service are included in the Technical Appendix). The City of Agoura Hills considers LOS "C" as the acceptable standard for Agoura Road.

Existing peak hour volumes for Agoura Road were obtained from traffic count data collected in August of 2015 by ATE. Note that the P.M. peak hour volumes are higher than the A.M. peak hour and therefore represent the worst case scenario. Table 1 lists the study-area roadway segments and summarizes their operations. Figure 3 illustrates the existing volumes.

Table 1
Existing Roadway Operations

Roadway	Segment	Roadway Type	P.M. Peak Hour LOS
Agoura Road			
- eastbound	Ladyface Cir./Roadside Rd.	2-Lane Roadway	LOS E
- westbound	Ladyface Cir./Roadside Rd.	2-Lane Roadway	LOS E
Agoura Road			
- eastbound	Roadside Rd./Kanan Rd.	2-Lane Roadway	LOS E
- westbound	Roadside Rd./Kanan Rd.	2-Lane Roadway	LOS E

The data presented in Table 1 indicate that the existing study-area 2-lane roadway segments currently operate in the LOS E range. Once the widening is completed, Agoura Road will operate at LOS A.

Intersection Operations

Because traffic flow on urban arterial roadways is most constrained at intersections, detailed traffic flow analyses focus on the operating conditions of critical intersections during peak travel periods. In rating intersection operations, LOS A through F are used (more complete definitions of levels of service are included in the Technical Appendix). The City of Agoura Hills considers LOS C as the minimum acceptable operating standard for intersections.

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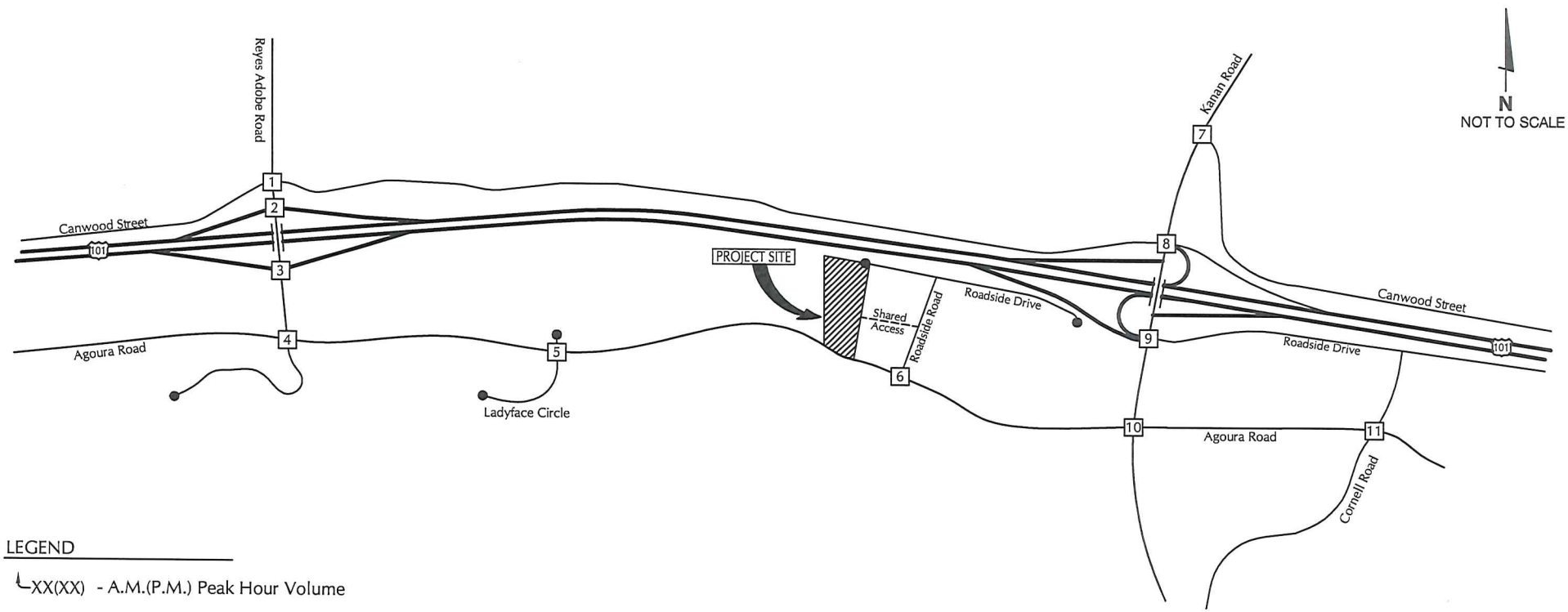
[1] 2010 Highway Capacity Manual, Transportation Research Board, 2010.



LEGEND

└XX(XX) - A.M.(P.M.) Peak Hour Volume

1 31(25) → 837(387) → 30(47) → ← 25(37) ← 8(38) ← 111(112) 32(56) → 18(10) → 191(196) → ← 99(106) ← 514(588) ← 135(170)	3 500(153) → 565(224) → 310(411) → 2(5) → 447(199) → ← 101(261) ← 150(596)	5 2(22) → 0(0) → 1(1) → ← 5(1) ← 211(371) ← 46(15) 84(10) → 231(286) → 104(23) → ← 6(70) ← 1(0) ← 7(131)
2 727(287) → 494(340) → ← 315(318) ← 333(93) ← 378(671) ← 75(331)	4 397(257) → 33(20) → 515(97) → ← 108(496) ← 136(415) ← 1(3) 108(289) → 134(281) → 3(3) → ← 2(110) ← 3(25) ← 4(112)	6 12(22) → 16(12) → ← 24(12) ← 318(301) 8(15) → 153(403) →

7 209(201) → 1649(941) → ← 122(305) ← 265(376) ← 241(313) ← 1190(1399)	9 135(150) → 800(608) → 1029(330) → ← 72(281) ← 24(21) 502(533) → 126(220) → 630(681) → ← 20(48) ← 510(748)	11 10(33) → 5(20) → 11(52) → ← 12(23) ← 116(361) ← 17(68) 10(37) → 163(495) → 4(17) → ← 37(43) ← 4(20) ← 0(18)
8 1331(745) → 40(59) → ← 686(693) ← 107(74) ← 506(223) 51(77) → 0(9) → 128(116) → ← 289(586) ← 711(951) ← 60(44)	10 97(260) → 1050(829) → 251(1162) → ← 59(161) ← 62(203) ← 50(95) 89(137) → 70(244) → 96(167) → ← 16(48) ← 609(756) ← 48(149)	

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EXISTING TRAFFIC VOLUMES

FIGURE 3

MMF - #15068

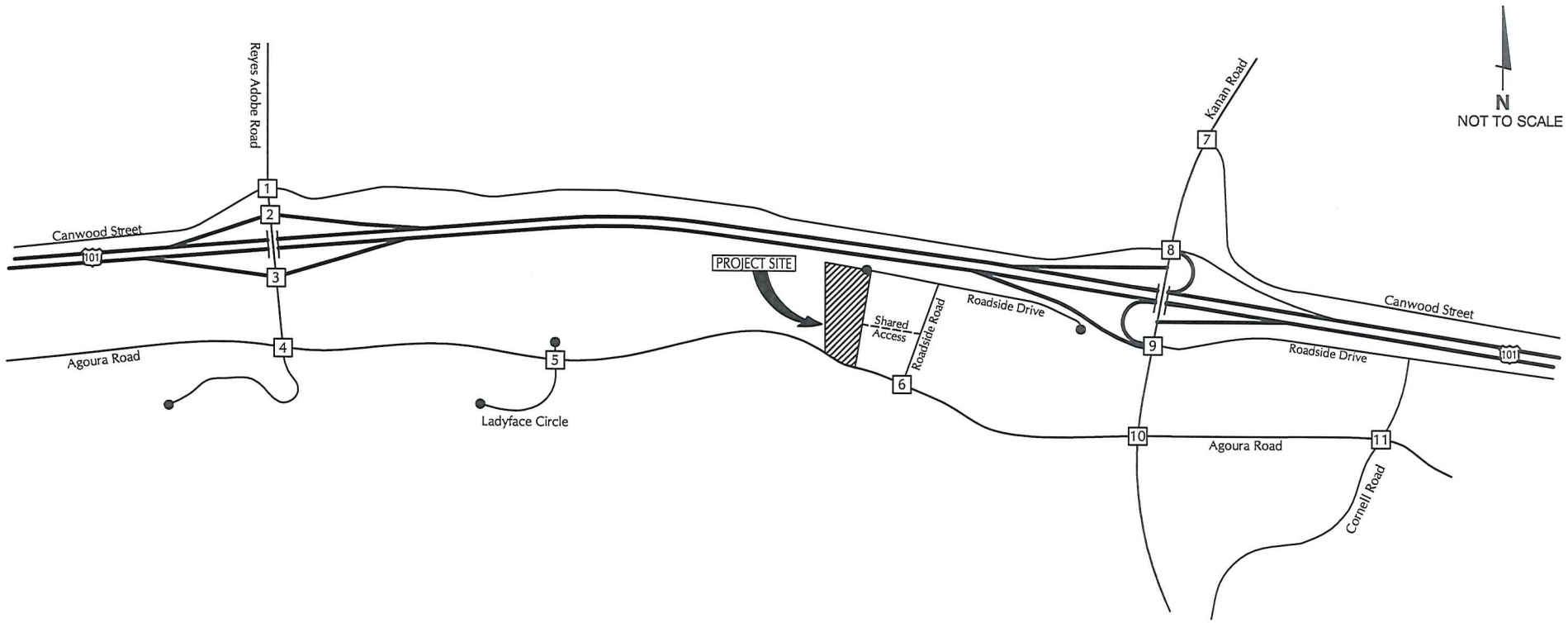
Figure 4 shows the study-area intersections, the existing traffic controls, and the intersection lane geometries. Existing peak hour volumes at study-area intersections were collected in February of 2015 and August of 2015 while school was in session (traffic count data is contained in the Technical Appendix for reference). Existing A.M. and P.M. peak hour traffic volumes for the study-area intersections are shown on Figure 3. Levels of service were calculated for the signalized intersections based on the "Intersection Capacity Utilization" (ICU) methodology. Levels of service for the unsignalized intersections were calculated using the methodology outlined in the 2010 HCM. Table 2 lists the existing levels of service for the study-area intersections (calculation worksheets are contained in the Technical Appendix).

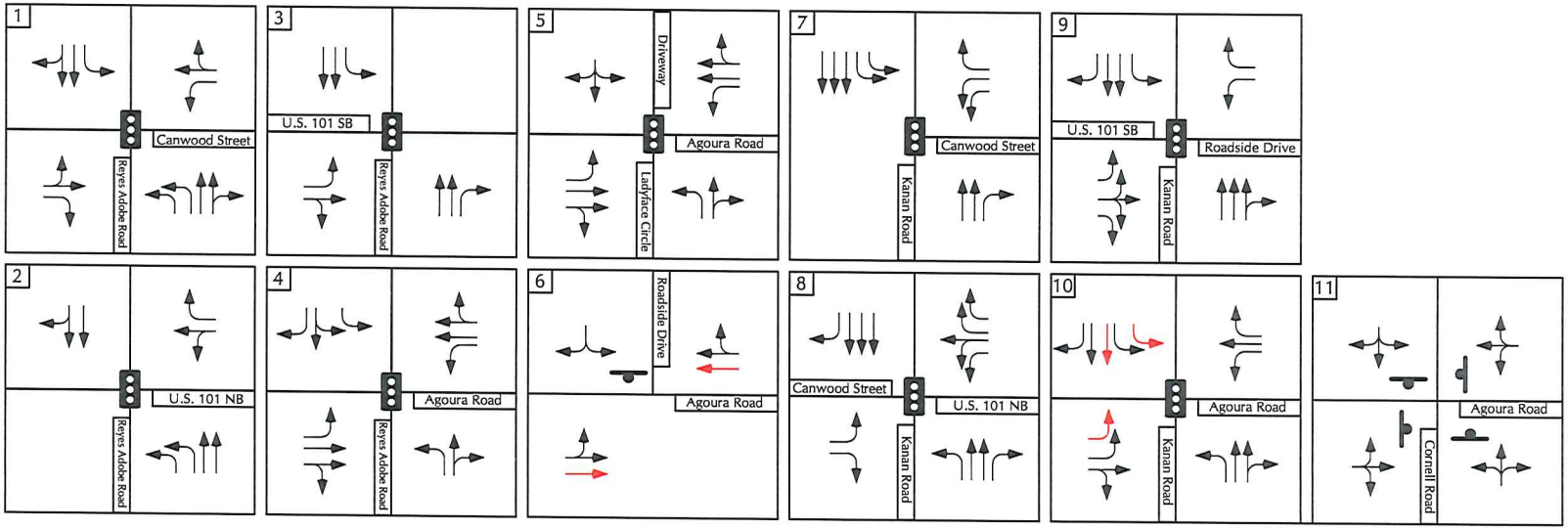
Table 2
Existing Intersection Levels of Service

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	ICU/Delay[(a)]	LOS	ICU/Delay[(a)]	LOS
Reyes Adobe Road/Canwood Street	0.70	LOS A	0.60	LOS A
U.S. 101 NB Ramp/Reyes Adobe Road	0.67	LOS B	0.56	LOS A
U.S. 101 SB Ramp/Reyes Adobe Road	0.62	LOS B	0.59	LOS A
Agoura Road/Reyes Adobe Road	0.52	LOS A	0.63	LOS B
Agoura Road/Ladyface Circle	0.18	LOS A	0.27	LOS A
Agoura Road/Roadside Road	10.4 sec.	LOS B	11.8 sec.	LOS B
Kanan Road/Canwood Street	0.59	LOS A	0.69	LOS B
U.S. 101 NB Ramp/Canwood Street/Kanan Road	0.66	LOS B	0.61	LOS B
U.S. 101 SB Ramp/Roadside Drive/Kanan Road	0.58	LOS A	0.70	LOS B
Agoura Road/Kanan Road	**0.87**	**LOS D**	**0.98**	**LOS E**
Agoura Road/Cornell Road	8.1 sec.	LOS A	20.7 sec	LOS C

(a) ICU reported for signalized intersections and delay reported for unsignalized intersections.
Bold Values exceed City's LOS C standard.

The data presented in Table 2 shows the Agoura Road/Kanan Road intersection currently operates at LOS D during the A.M. peak hour period and LOS E during P.M. peak hour period. A planned improvement for the Agoura Road/Kanan Road intersection discussed in the following section will improve the operation of the intersection.





ASSOCIATED TRANSPORTATION ENGINEERS

INTERSECTION LANE GEOMETRIES AND TRAFFIC CONTROLS

FIGURE 4

MMF - #15068

PLANNED IMPROVEMENTS

The City of Agoura Hills has identified the following near-term and cumulative programmed improvements for the signalized Agoura Road/Kanan Road intersection and the 2-lane section of Agoura Road from Kanan Road to Ladyface Circle.

Near-Term Improvements

Agoura Road from Ladyface Circle to Kanan Road Improvement: The existing undivided 2-lane section of Agoura Road is currently being widened to a 4-lane divided section with a landscaped median. Pedestrian sidewalks and bicycle lanes will be provided in both directions.

Agoura Road/Kanan Road Intersection Improvement:
Southbound Approach: Add a second left-turn lane and a through lane.
Eastbound Approach: Add a second left-turn lane.

Cumulative Improvements

Agoura Road/Kanan Road Intersection Improvement:
Eastbound Approach: Add an exclusive right-turn lane.
Northbound Approach: Add an exclusive right-turn lane.

THRESHOLDS OF SIGNIFICANCE

The City of Agoura Hills considers LOS C or better acceptable for signalized intersection operations. A significant impact would occur when a proposed project increases traffic demand by:

> 4% or greater (V/C increase $\geq$ 0.04) at a facility that would operate at LOS C with project-added traffic volumes.
>
> 2% or greater (V/C increase $\geq$ 0.02) at a facility that would operate at LOS D with project-added traffic volumes.
>
> 1% or greater (V/C increase $\geq$ 0.01) at a facility that would operate at LOS E/F with project-added traffic volumes.

The City of Agoura Hills considers LOS C or better acceptable for unsignalized intersection operations. A significant impact would occur if there is a change in the LOS with the addition of project traffic to LOS D or worse. A significant impact at an unsignalized intersection would also occur if there is a increase in delay by 5 or more seconds for intersections operating at an unacceptable LOS. A significant impact at an unsignalized intersection would also occur if the California Manual on Uniform Traffic Control Devices (MUTCD) warrants for traffic signals are satisfied with the addition of project traffic.

PROJECT-SPECIFIC ANALYSIS

Project Trip Generation

Trip generation estimates were calculated for the Courtyard & TownePlace Suites Hotel based on the rates published in the Institute of Transportation Engineers (ITE), Trip Generation, 9th Edition for Hotels (Land-Use Code #310).[2] Table 3 summarizes the average daily, A.M. and P.M. peak hour trip generation estimates for the hotel project.

Table 3
Project Trip Generation

Land Use	Size	ADT		A.M. Peak Hour		P.M. Peak Hour	
		Rate	Trips	Rate	Trips (In/Out)	Rate	Trips (In/Out)
Hotel	225 Rooms	8.17	1,838	0.53	119 (70/49)	0.60	135(69/66)

The proposed hotel project would generate a total of 1,838 average daily trips (ADT), 119 A.M. peak hour trips, and 135 P.M. peak hour trips as shown in Table 3.

[2] Trip Generation, Institute of Transportation Engineers, 9th Edition, 2013.

Project Trip Distribution

The project-generated traffic volumes were distributed and assigned to the adjacent street network based on percentages shown in Table 4 and illustrated on Figure 5. The trip distribution percentages were developed based on existing traffic patterns observed in the study area, input from City staff, and consideration of the most logical travel routes for drivers accessing the proposed hotel.

Table 4
Project Trip Distribution

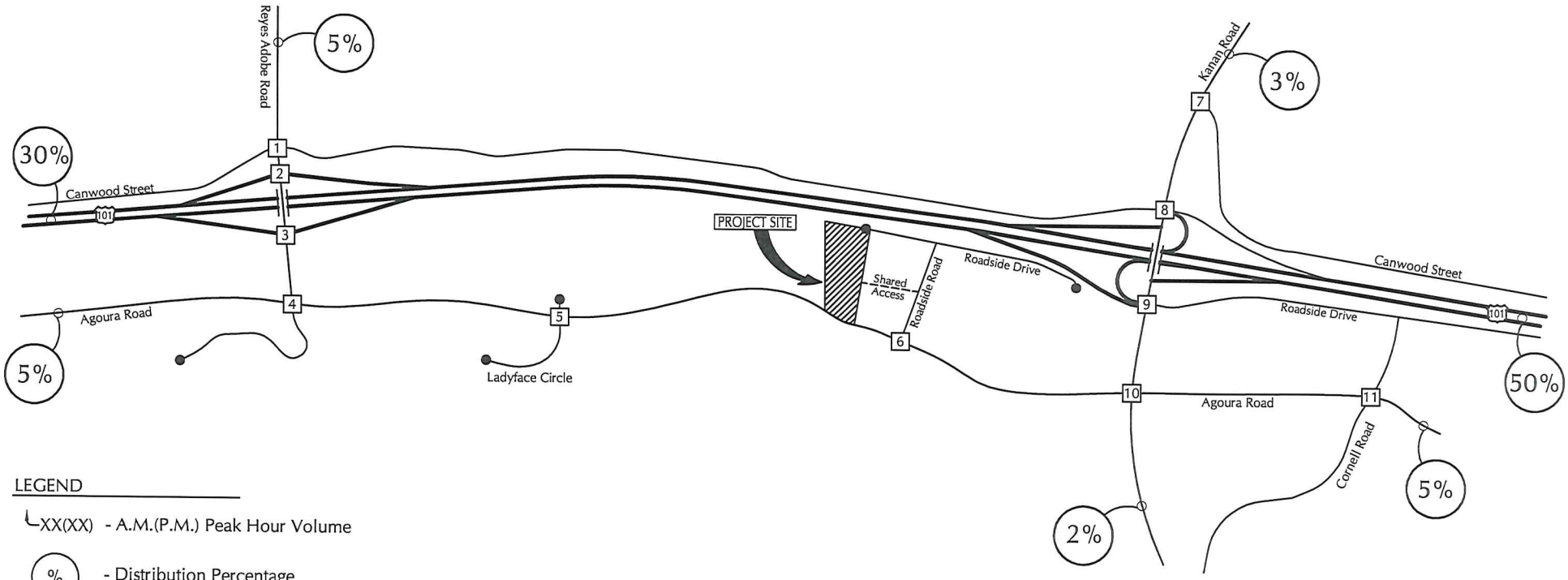
Origin/Destination	Direction	Percent
U.S. Highway 101 East of Kanan Road	East	50%
U.S. Highway 101 West of Reyes Adobe Road	West	30%
Reyes Adobe Road North of U.S. Highway 101	North	5%
Kanan Road North of U.S. Highway 101/Canwood Street	North	3%
Kanan Road South of Agoura Road	South	2%
Agoura Road East of Cornell Road	East	5%
Agoura Road West of Reyes Adobe Road	West	5%
	Total	**100%**

Project-Specific Impacts

Roadways. Levels of service were calculated for Agoura Road assuming the Existing + Project volumes. LOS Worksheets are contained in the Technical Appendix. Roadway level of service for the existing and existing + project conditions are listed in Table 5. As noted previously the Existing + Project analysis assumes the completion of the Agoura Road widening project that is currently under construction.

Table 5
Existing + Project Roadway Operations

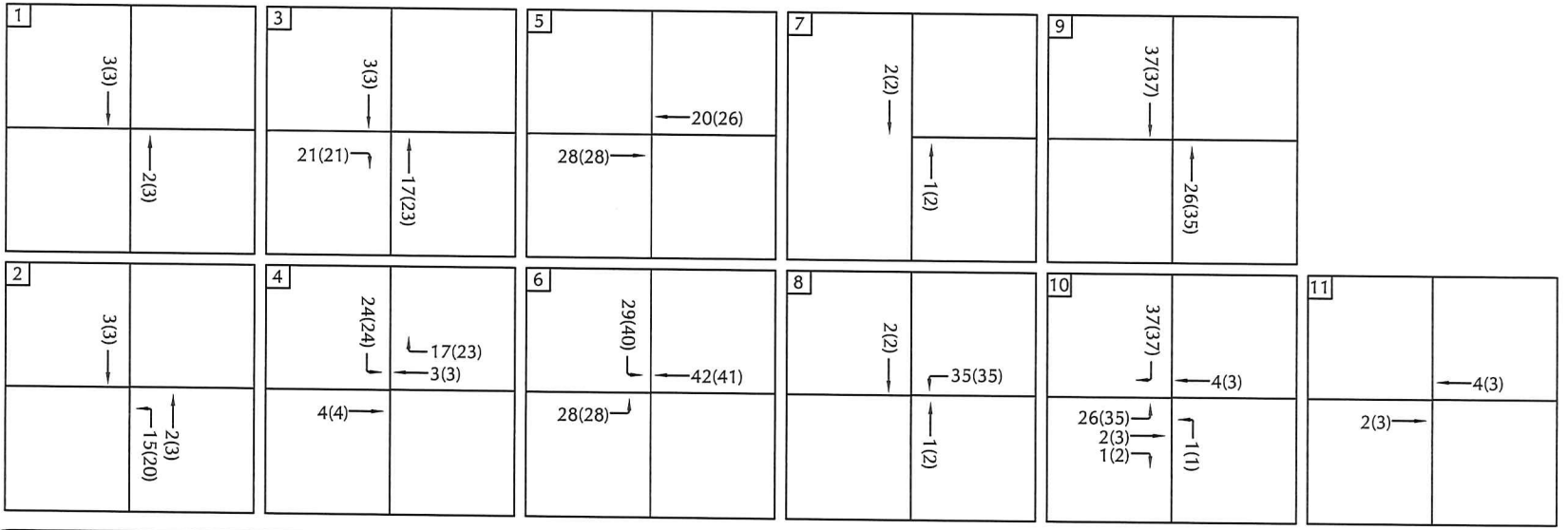
Roadway	Segment	Roadway Type	P.M. Peak Hour LOS		Impact
			Existing	Existing + Project	
Agoura Road					
- westbound	Ladyface Cir./Roadside Rd.	4-Lane Roadway	LOS E	LOS A	No
- eastbound	Ladyface Cir./Roadside Rd.	4-Lane Roadway	LOS E	LOS A	No
Agoura Road					
- westbound	Roadside Rd./Kanan Rd.	4-Lane Roadway	LOS E	LOS A	No
- eastbound	Roadside Rd./Kanan Rd.	4-Lane Roadway	LOS E	LOS A	No



LEGEND

XX(XX) - A.M.(P.M.) Peak Hour Volume

% - Distribution Percentage



ASSOCIATED TRANSPORTATION ENGINEERS

PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

FIGURE 5

MMF - #15068

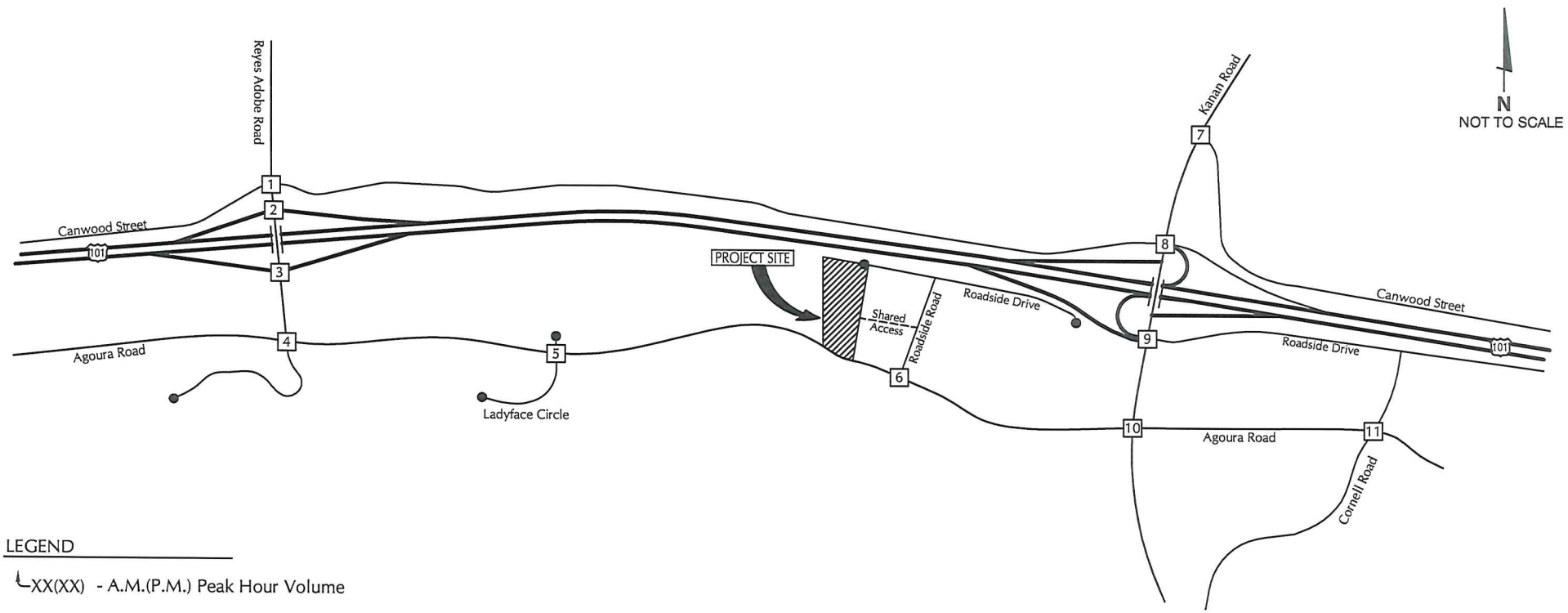
The data in Table 5 show that with the widening to 4-lanes Agoura Road would operate at LOS A. The addition of project traffic to Agoura Road would not significantly impact the roadway segments adjacent to the site based on City of Agoura Hills impact thresholds.

Intersections. Levels of service were calculated for the study-area intersections assuming the Existing + Project traffic volumes presented on Figure 6. Tables 6 and 7 compare the Existing and Existing + Project levels of service and identify project-specific impacts based on City thresholds. Analysis assumes the implementation of the City's road widening improvements on Agoura Road adjacent to the project site.

Table 6
Existing and Existing + Project A.M. Peak Hour Levels of Service

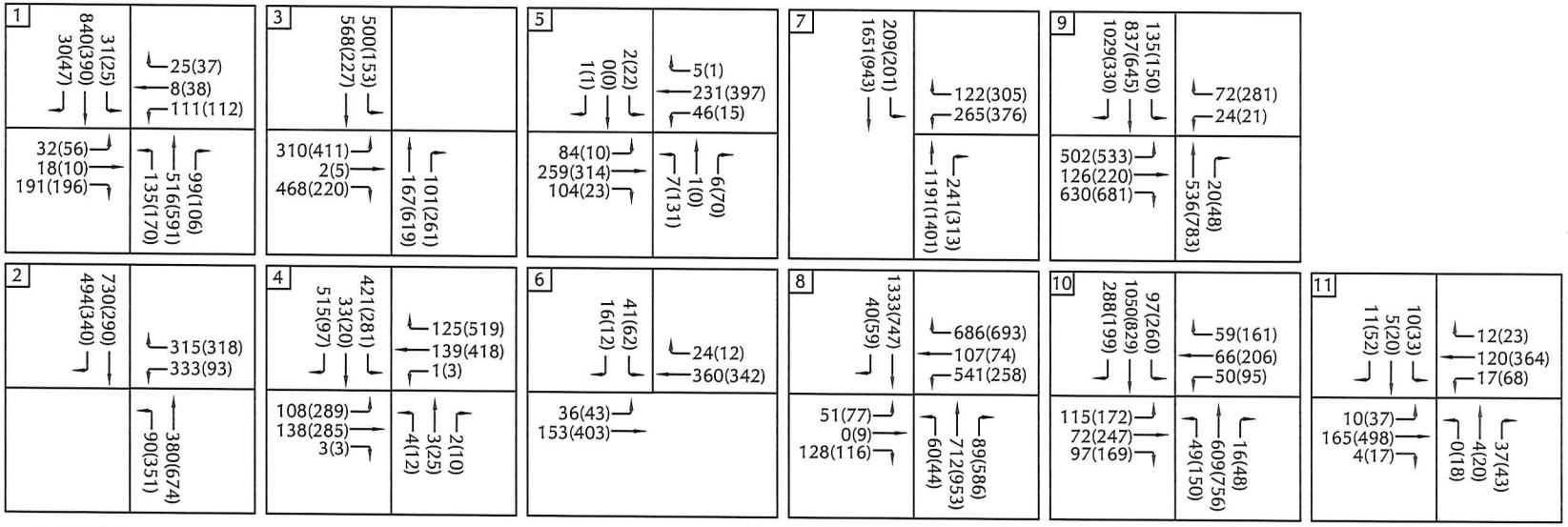
Intersection	Existing		Existing + Project		Project Added	
	ICU/Delay[(a)]	LOS	ICU/Delay[(a)]	LOS	Increase	Impact?
Reyes Adobe Rd./Canwood St.	0.70	B	0.70	B	0.00	NO
U.S. 101 NB Ramp/Reyes Adobe Rd.	0.67	B	0.67	B	0.00	NO
U.S. 101 SB Ramp/Reyes Adobe Rd.	0.62	B	0.62	B	0.00	NO
Agoura Rd./Reyes Adobe Rd.	0.52	A	0.53	A	0.01	NO
Agoura Rd./Ladyface Cir.	0.18	A	0.20	A	0.02	NO
Agoura Rd./Roadside Rd.	10.4 sec.	B	10.2 sec.	B	–0.2 sec.	NO
Kanan Rd./Canwood St.	0.59.	A	0.59	A	0.00	NO
U.S. 101 NB Ramp/Canwood St./Kanan Rd.	0.66	B	0.66	B	0.00	NO
U.S. 101 SB Ramp/Roadside Dr./Kanan Rd.	0.58	A	0.59	A	0.01	NO
Agoura Road/Kanan Road	**0.87**	**D**	**0.87**	**D**	**0.00**	**NO**
Agoura Road/Cornell Road	8.1 sec.	A	8.1 sec.	A	0.0 sec.	NO

(a) ICU reported for signalized intersections and delay reported for unsignalized intersections.
Bold Values exceed City's LOS C standard.



LEGEND

└XX(XX) - A.M.(P.M.) Peak Hour Volume



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EXISTING + PROJECT TRAFFIC VOLUMES

FIGURE 6

MMF - #15068

Table 7
Existing and Existing + Project P.M. Peak Hour Levels of Service

Intersection	Existing		Existing + Project		Project Added	
	ICU/Delay[a]	LOS	ICU/Delay[a]	LOS	Increase	Impact?
Reyes Adobe Rd./Canwood St.	0.60	A	0.60	A	0.00	NO
U.S. 101 NB Ramp/Reyes Adobe Rd.	0.56	A	0.57	A	0.01	NO
U.S. 101 SB Ramp/Reyes Adobe Rd.	0.59	A	0.60	A	0.01	NO
Agoura Rd./Reyes Adobe Rd.	0.63	B	0.64	B	0.01	NO
Agoura Rd./Ladyface Cir.	0.27	A	0.28	A	0.01	NO
Agoura Rd./Roadside Rd.	11.8 sec.	B	11.1 sec.	B	-0.7 sec.	NO
Kanan Rd./Canwood St.	0.69	B	0.69	B	0.00	NO
U.S. 101 NB Ramp/Canwood St./Kanan Rd.	0.61	B	0.61	B	0.00	NO
U.S. 101 SB Ramp/Roadside Dr./Kanan Rd.	0.70	B	0.70	B	0.00	NO
Agoura Road/Kanan Road	**0.98**	**E**	**0.98**	**E**	**0.00**	**NO**
Agoura Road/Cornell Road	20.7 sec.	C	21.0 sec.	C	0.3 sec.	NO

(a) ICU reported for signalized intersections and delay reported for unsignalized intersections.
Bold Values exceed City's LOS C standard.

The data presented in Tables 6 and 7 indicate that the Agoura Road/Kanan Road intersection would operate in the LOS D - E range. The project's traffic additions would not generate project-specific impacts based on City of Agoura Hills impact thresholds since the V/C increase attributable to the project delay is less than 0.01. The remaining intersections would operate at LOS C or better.

NEAR-TERM (OPENING YEAR 2016) ANALYSIS

The City of Agoura Hills requires that intersections be analyzed with the addition of traffic generated by approved/pending developments that would be operational by the opening year (Year 2016) of the project and an ambient growth factor of 0.75 percent over a 1 year period (1.0075). The Year 2016 analysis assumes implementation of the City's near-term improvements on Agoura Road adjacent to the project site and at the Agoura Road/Kanan Road intersection.

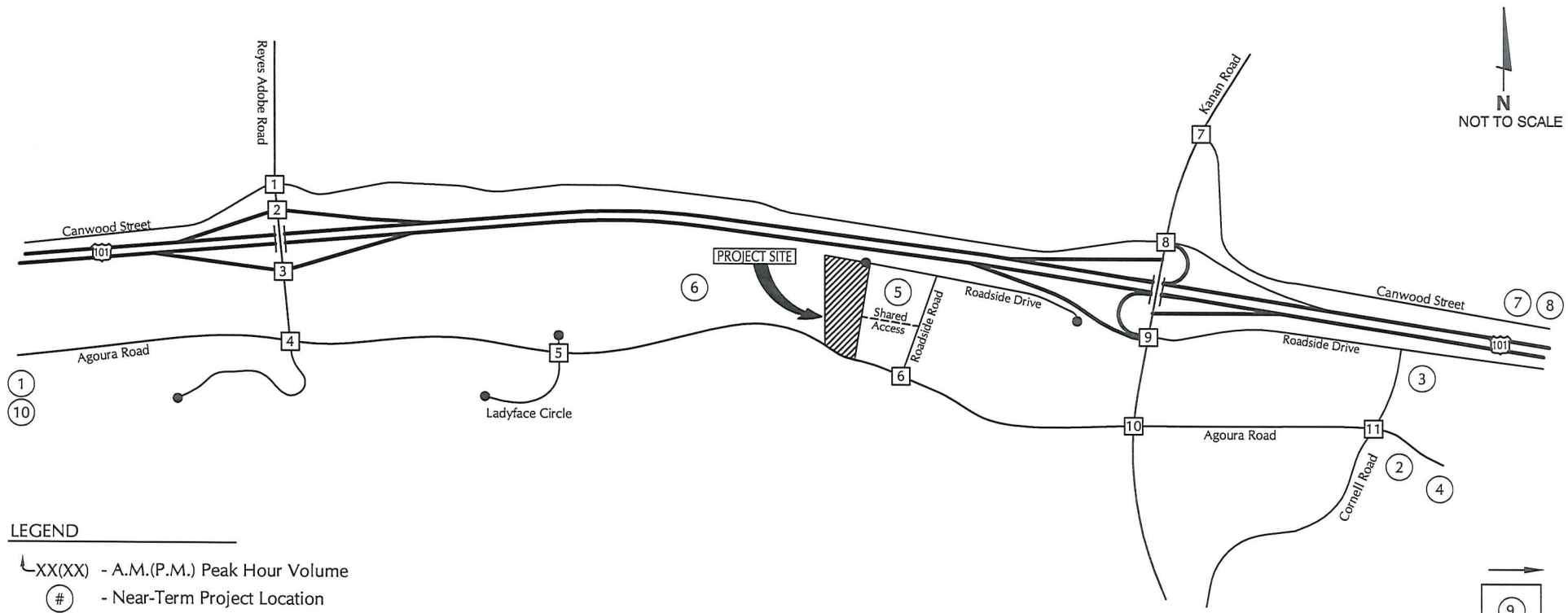
Traffic Forecasts

Near-Term (Opening Year 2016) traffic volumes were forecasted assuming development of the approved/pending projects proposed within the City of Agoura Hills. A copy of the City of Agoura Hills Development Summary June 2015 Quarterly Report is contained in the Technical Appendix for reference. Trip generation estimates were developed for the approved/pending projects using the rates presented in the ITE, Trip Generation, 9th Edition. Table 8 summarizes the average daily, A.M. and P.M. peak hour trip generation estimates for the approved/pending development projects. A spreadsheet containing the ITE Land Use Codes and trip generation rates is contained in the Technical Appendix for reference.

Table 8
Approved/Pending Development Projects Trip Generation

No.	Project	Land Use	Size	ADT	A.M. Peak (In/Out)	P.M. Peak (In/Out)
1.	Heathcote	Medical Office	14,075 s.f.	509	34 (27/7)	50 (14/36)
2.	Cornerstone Mixed-Use	Trip Generation from ATE T.I.S.		3,035	220 (135/85)	242 (114/128)
3.	Whizin Market	Trip Generation from ATE T.I.S.		4,274	234 (137/97)	319 (170/149)
4.	Utopia Hills	Restaurant Townhome Condominium Gym/Yoga	3,381 s.f. 8 Units 9 Units 2,204 s.f	430 46 52 72	36 (20/16) 4 (1/3) 4 (1/3) 3 (2/1)	33 (20/13) 4 (2/2) 5 (3/2) 8 (5/3)
5.	Selleck Development	Trip Generation from LSA T.I.S.		3,630	195(111/84)	237 (131/106)
6.	Agoura Landmark	Warehouse Office	48,532 s.f. 21,320 s.f.	173 235	14 (11/3) 33 (29/4)	16 (4/12) 32 (5/27)
7.	Shirvanian	Industrial Park	103,000 s.f.	718	95 (0/0)	100 (12/88)
8.	Agoura Business Center West	Commercial	21,782 s.f.	965	29 (0/0)	59 (26/33)
9.	APB	Office	30,400 s.f.	335	47 (41/6)	45 (8/37)
10.	Khantzis/Rice	Residential	46 units	267	20 (3/17)	24 (16/8)
11.	Jay Rogers	Residential	18 units	171	14 (4/10)	18 (11/7)
12.	Barry Robles	Residential	2 units	19	2 (1/1)	2 (1/1)
13.	Payan	Residential	1 unit	10	1 (1/0)	1 (0/1)
14.	Nabiollah Moallem	Residential	1 unit	10	1 (1/0)	1 (0/1)
15.	Katherine Neff	Residential	1 unit	10	1 (1/0)	1 (0/1)
16.	Abudalu	Residential	1 unit	10	1 (1/0)	1 (0/1)
17.	Texidor	Residential	1 unit	10	1 (1/0)	1 (0/1)
18.	Gold	Residential	1 unit	10	1 (1/0)	1 (0/1)
			Total Trips:	14,991	990 (622/368)	1,200 (549/651)

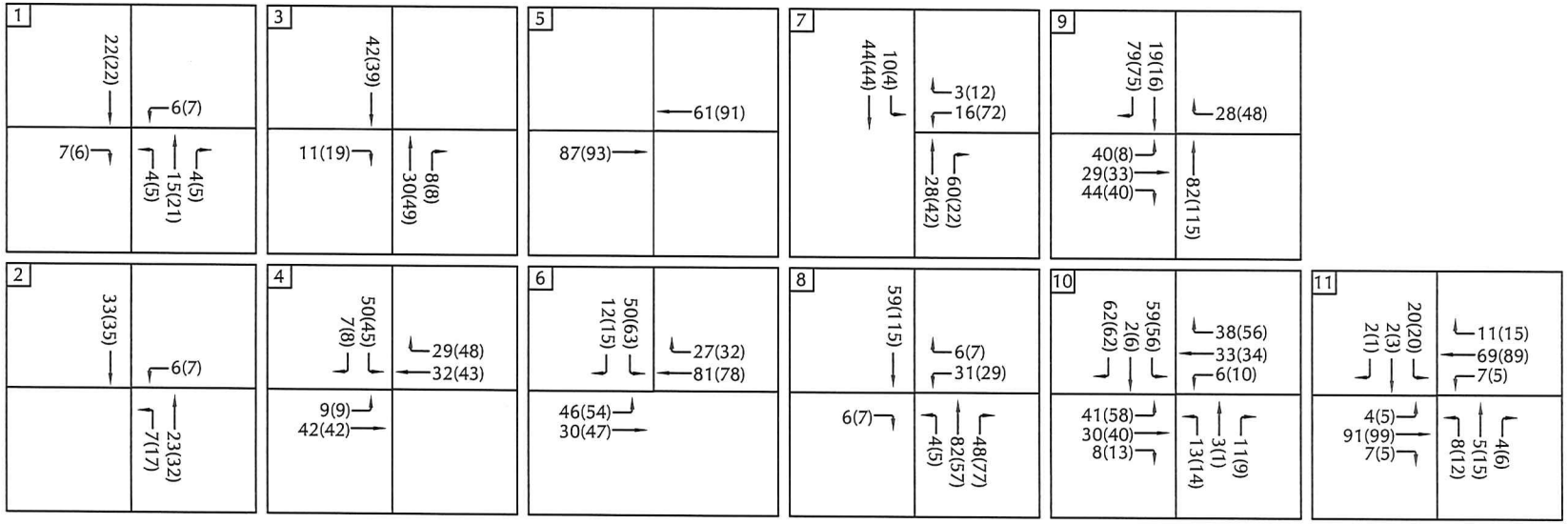
The data presented in Table 8 indicates that the approved/pending projects would generate a total of 14,991 average daily trips, 990 A.M. peak hour trips and 1,200 P.M. peak hour trips. The approved/pending projects' traffic volumes were distributed and assigned to the study-area intersections. The trip assignment for the approved/pending projects was developed based on the location of each project, recent traffic studies, existing traffic patterns observed in the study-area as well as a general knowledge of the population, employment and commercial centers in Agoura Hills. Figure 7 illustrates the Near-Term-Added peak hour traffic volumes for the study-area intersections. The trip distribution for the Near-Term projects is presented in the Technical Appendix.

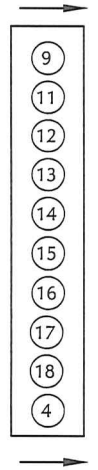


LEGEND

XX(XX) - A.M.(P.M.) Peak Hour Volume

(#) - Near-Term Project Location





ASSOCIATED TRANSPORTATION ENGINEERS

NEAR-TERM ADDED TRAFFIC VOLUMES

FIGURE 7

MMF - #15068

Near-Term Impacts

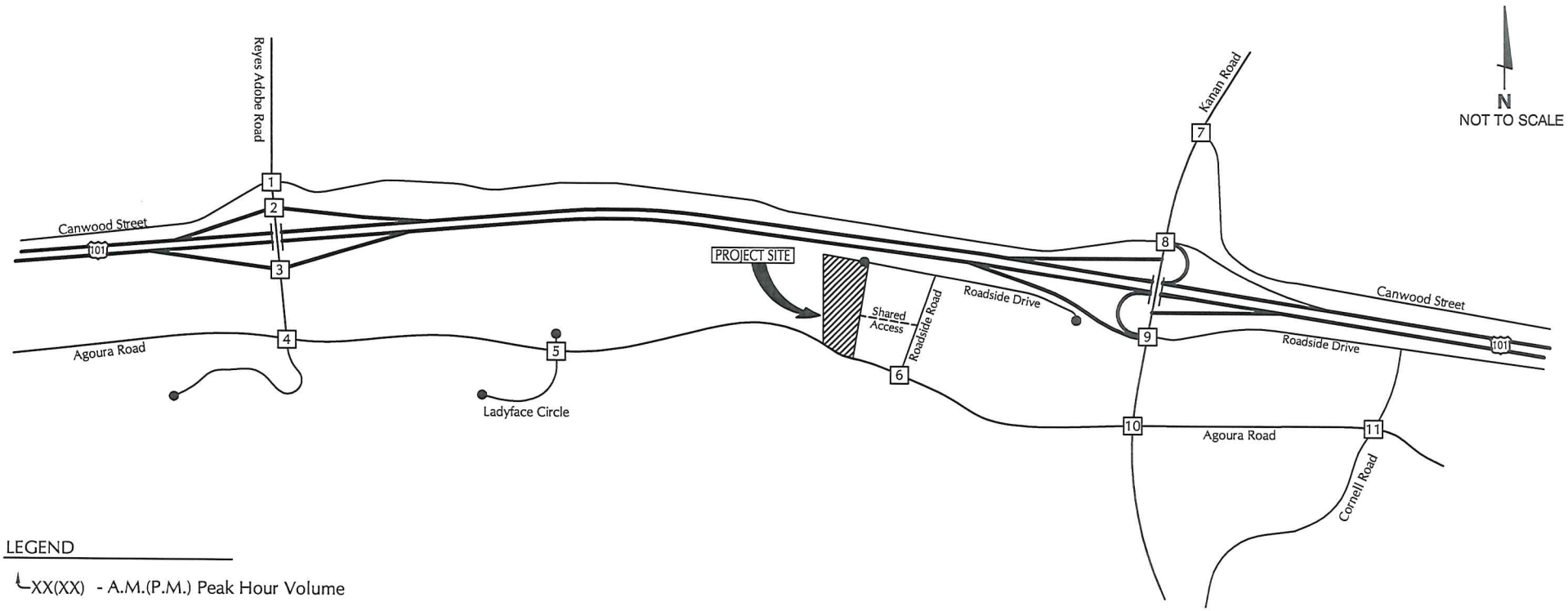
Roadways. Levels of service were calculated for Agoura Road assuming the Near-Term + Project volumes. LOS Worksheets are contained in the Technical Appendix. Roadway level of service for the Near-Term and Near-Term + Project conditions are listed in Table 9.

Table 9
Near-Term + Project Roadway Operations

Roadway	Segment	Roadway Type	Peak Hour LOS		Impact
			Near-Term	Near-Term + Project	
Agoura Road					
- eastbound	Ladyface Cir./Roadside Rd.	4-Lane Roadway	LOS A	LOS A	No
- westbound	Ladyface Cir./Roadside Rd.	4-Lane Roadway	LOS A	LOS A	No
Agoura Road					
- eastbound	Roadside Rd./Kanan Rd.	4-Lane Roadway	LOS A	LOS A	No
- westbound	Roadside Rd./Kanan Rd.	4-Lane Roadway	LOS A	LOS A	No

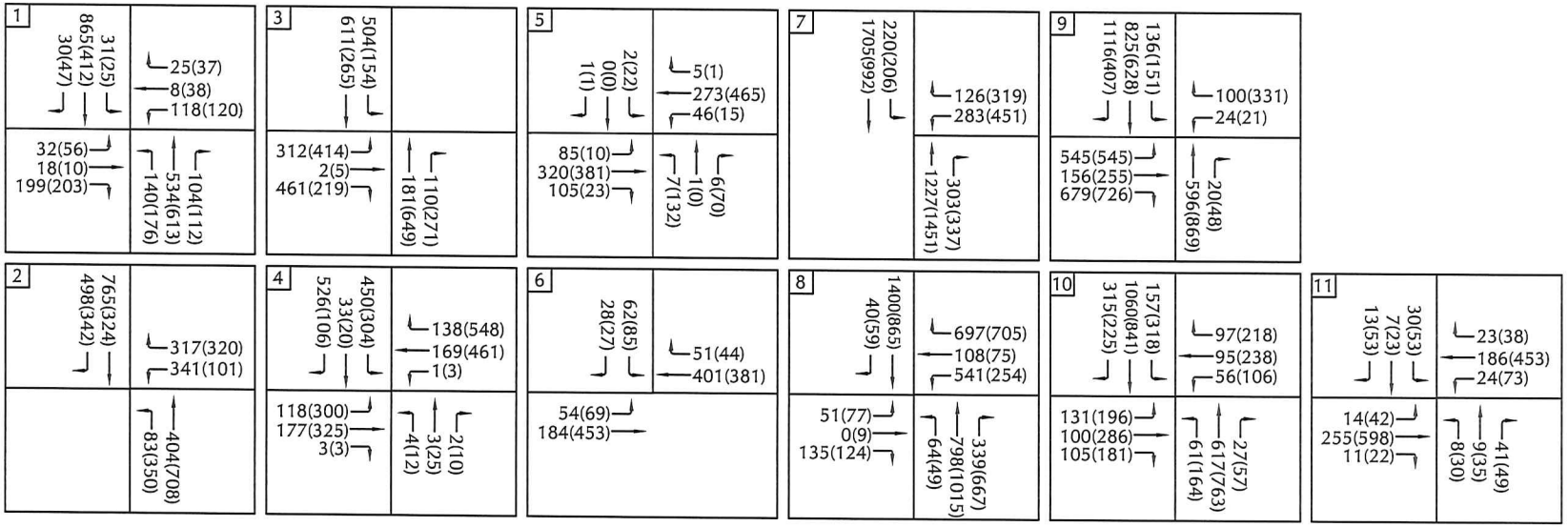
The data presented in Table 9 show that the addition of project traffic to the Agoura Road would not significantly impact the roadway segments adjacent to the site based on City of Agoura Hills impact thresholds.

Intersections. Levels of service were calculated for the study-area intersections assuming the Near-Term and Near-Term + Project traffic volumes presented on Figures 8 and 9. Tables 10 and 11 compare the Near-Term and Near-Term + Project levels of service for the study-area intersections and identify near-term impacts based on City thresholds.



LEGEND

└XX(XX) - A.M.(P.M.) Peak Hour Volume



ASSOCIATED TRANSPORTATION ENGINEERS

NEAR-TERM TRAFFIC VOLUMES

FIGURE 8

1.0075 + NEAR TERM ADDED MMF - #15068