Appendix A Traffic Data Summary Tables

This appendix contains summary tables, presenting the traffic data used for the traffic noise modeling, for existing conditions and for design-year conditions under the No-Build and Build conditions.

Table A-1 **Existing PM Peak Hour Traffic Volumes**

Roadway	Segment	Number of Lanes	Total Peak Hour Volume	Auto		Trucks (Heavy)		Speed
				Percent	Volume	Percent	Volume	
Pleasant Grove Blvd	West of Washington Blvd	6	3,921	98%	3,843	2%	78	45
Pleasant Grove Blvd	East of Washington Blvd	6	4,027	98%	3,946	2%	81	45
Washington Blvd	North of Pleasant Grove Blvd	4	1,595	98%	1,563	2%	32	45
Washington Blvd	Between Pleasant Grove Blvd and Emerald/Diamond Oaks Rd	2 to 4	2,115	98%	2,073	2%	42	45
Washington Blvd	Between Emerald/Diamond Oaks Rd and Kaseberg Dr	2	1,989	98%	1,949	2%	40	45
Washington Blvd	Between Kaseberg Dr and Sawtell Rd	4	2,026	98%	1,985	2%	41	45
Washington Blvd	Between Sawtell Rd and Junction Blvd	4	2,031	98%	1,990	2%	41	45
Emerald Oak Rd	West of Washington Blvd	2	44	98%	43	2%	1	25
Diamond Oaks Rd	East of Washington Blvd	2	472	98%	463	2%	9	25
Kaseberg Dr	West of Washington Blvd	2	117	98%	115	2%	2	25
Sawtell Rd	West of Washington Blvd	2	175	98%	172	2%	4	25
Derek Pl	East of Washington Blvd	2	96	98%	94	2%	2	25

Table A-2 **Future No Build PM Peak Hour Traffic Volumes**

Roadway	Segment	Number of Lanes	Total Peak Hour Volume	Auto		Trucks (Heavy)		Speed
				Percent	Volume	Percent	Volume	
Pleasant Grove Blvd	West of Washington Blvd	6	5,113	98%	5,011	2%	102	45
Pleasant Grove Blvd	East of Washington Blvd	6	5,162	98%	5,059	2%	103	45
Washington Blvd	North of Pleasant Grove Blvd	4	2,586	98%	2,534	2%	52	45
Washington Blvd	Between Pleasant Grove Blvd and Emerald/Diamond Oaks Rd	2 to 4	2,587	98%	2,535	2%	52	45
Washington Blvd	Between Emerald/Diamond Oaks Rd and Kaseberg Dr	2	2,242	98%	2,197	2%	45	45
Washington Blvd	Between Kaseberg Dr and Sawtell Rd	4	2,244	98%	2,199	2%	45	45
Washington Blvd	Between Sawtell Rd and Junction Blvd	4	2,273	98%	2,228	2%	45	45
Emerald Oak Rd	West of Washington Blvd	2	52	98%	51	2%	1	25
Diamond Oaks Rd	East of Washington Blvd	2	887	98%	869	2%	18	25
Kaseberg Dr	West of Washington Blvd	2	114	98%	112	2%	2	25
Sawtell Rd	West of Washington Blvd	2	176	98%	172	2%	4	25
Derek Pl	East of Washington Blvd	2	103	98%	101	2%	2	25

Table A-3 **Future Build PM Peak Hour Traffic Volumes**

Roadway	Segment	Number of Lanes	Total Peak Hour Volume	Auto		Trucks (Heavy)		Speed
				Percent	Volume	Percent	Volume	
Pleasant Grove Blvd	West of Washington Blvd	6	5,065	98%	4,964	2%	101	45
Pleasant Grove Blvd	East of Washington Blvd	6	5,293	98%	5,187	2%	106	45
Washington Blvd	North of Pleasant Grove Blvd	4	2,842	98%	2,785	2%	57	45
Washington Blvd	Between Pleasant Grove Blvd and Emerald/Diamond Oaks Rd	4	3,182	98%	3,118	2%	64	45
Washington Blvd	Between Emerald/Diamond Oaks Rd and Kaseberg Dr	4	2,979	98%	2,919	2%	60	45
Washington Blvd	Between Kaseberg Dr and Sawtell Rd	4	2,977	98%	2,917	2%	60	45
Washington Blvd	Between Sawtell Rd and Junction Blvd	4	2,993	98%	2,933	2%	60	45
Emerald Oak Rd	West of Washington Blvd	2	49	98%	48	2%	1	25
Diamond Oaks Rd	East of Washington Blvd	2	878	98%	860	2%	18	25
Kaseberg Dr	West of Washington Blvd	2	114	98%	112	2%	2	25
Sawtell Rd	West of Washington Blvd	2	182	98%	178	2%	4	25
Derek Pl	East of Washington Blvd	2	104	98%	102	2%	2	25

Appendix B Predicted Future Noise Levels and Noise Barrier Analysis

Washington Boulevard/Andora Bridge Improvement Project Future Worst Hour Noise Levels (Traffic Noise Only) - $L_{eq}(h)$, dBA

Receiver I.D.	Measurement Location	Noise Barrier I.D.	Land Use / Activity Category	Number of Dwelling Units or Equivalent	Address	Existing Noise Level $L_{eq}(h)$, dBA	Design Year Noise Level without Project, Leq(h), dBA	Design Year Noise Level with Project, Leq(h), dBA	Design Year Noise Level without Project minus Existing Conditions Leq(h), dBA	Design Year Noise Level with Project minus No Project Conditions Leq(h), dBA	Design Year Noise Level with Project minus Existing Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type (None, or A/E)	Wall Heights																	
														6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
														$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR
M1	--	--	Residential/B	1	241 Needle Court	59	61	61	2	0	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M2	--	--	Residential/B	2	240 Needle Court	59	60	61	1	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M3	--	--	Residential/B	2	333 Aspen Court	55	56	57	1	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M4	--	--	Residential/B	2	224 Needle Court	52	53	54	1	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M5	--	--	Residential/B	1	340 Aspen Court	57	58	59	1	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M6	--	--	Residential/B	2	332 Aspen Court	54	55	56	1	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M7	--	--	Residential/B	2	324 Aspen Court	49	50	50	1	0	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M8	ST2	--	Residential/B	1	465 Elmwood Court	59	60	61	1	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M9	--	--	Residential/B	1	464 Elmwood Court	61	62	63	1	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M10	--	--	Residential/B	1	456 Elmwood Court	54	55	56	1	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M11	--	--	Residential/B	1	448 Elmwood Court	54	54	55	0	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M12	--	--	Residential/B	2	1200 Emerald Oak Road	56	57	58	1	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Washington Boulevard/Andora Bridge Improvement Project Future Worst Hour Noise Levels (Traffic Noise Only) - $L_{eq}(h)$, dBA

Receiver I.D.	Measurement Location	Noise Barrier I.D.	Land Use / Activity Category	Number of Dwelling Units or Equivalent	Address	Existing Noise Level $L_{eq}(h)$, dBA	Design Year Noise Level without Project, Leq(h), dBA	Design Year Noise Level with Project, Leq(h), dBA	Design Year Noise Level without Project minus Existing Conditions Leq(h), dBA	Design Year Noise Level with Project minus No Project Conditions Leq(h), dBA	Design Year Noise Level with Project minus Existing Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type (None, or A/E)	Wall Heights																
														6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
														$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR
M13	--	--	Residential/B	1	1216 Emerald Oak Road	51	52	53	1	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M14	--	--	Residential/B	1	1224 Emerald Oak Road	49	50	51	1	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M15		--	Residential/B	2	50 Gingerhill Court	60	61	62	1	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M16		1	Residential/B	1	125 Silverado Circle	65	66	67	1	1	2	B (67)	A/E	66	1	0	63	4	0	59	8	1	57*	10*	1*	56*	11*	1*	55*	12*	1*
M17	ST1	--	Public Right-of-Way/G	0	NA	68	68	69	0	1	1	G (-)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M18		1	Residential/B	2	123 Silverado Circle	66	67	68	1	1	2	B (67)	A/E	61	7	2	58*	10*	2*	56*	12*	2*	54*	14*	2*	53*	15*	2*	52*	16*	2*
M19		1	Residential/B	2	119 Silverado Circle	67	67	68	0	1	1	B (67)	A/E	61*	7*	2*	57*	11*	2*	55*	13*	2*	53*	15*	2*	52*	16*	2*	50*	18*	2*
M20		1	Residential/B	1	115 Silverado Circle	65	66	68	1	2	3	B (67)	A/E	67	1	0	64	4	0	61	7	1	59	9	1	58	10	1	56*	12*	1*
M21		1	Residential/B	1	113 Silverado Cricle	64	65	67	1	2	3	B (67)	A/E	65	2	0	63	4	0	61	6	1	58*	9*	1*	56*	11*	1*	55*	12*	1*
M22		--	Residential/B	1	1241 Emerald Oak Road	53	54	54	1	0	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Washington Boulevard/Andora Bridge Improvement Project Future Worst Hour Noise Levels (Traffic Noise Only) - $L_{eq}(h)$, dBA

Receiver I.D.	Measurement Location	Noise Barrier I.D.	Land Use / Activity Category	Number of Dwelling Units or Equivalent	Address	Existing Noise Level $L_{eq}(h)$, dBA	Design Year Noise Level without Project, Leq(h), dBA	Design Year Noise Level with Project, Leq(h), dBA	Design Year Noise Level without Project minus Existing Conditions Leq(h), dBA	Design Year Noise Level with Project minus No Project Conditions Leq(h), dBA	Design Year Noise Level with Project minus Existing Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type (None, or A/E)	Wall Heights																	
														6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
														$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR
M23		--	Residential/B	1	1249 Emerald Oak Road	49	50	50	1	0	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M24		--	Residential/B	1	108 Sprig Court	54	56	57	2	1	3	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M25		--	Residential/B	1	109 Sprig Court	56	56	59	0	3	3	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M26		--	Residential/B	3	101 Sprig Court	59	59	61	0	2	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M27	ST3	--	Residential/B	0	South of 120 Glenwood Circle	58	59	61	1	2	3	B (67)	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M28		--	Residential/B	2	132 Glenwood Circle	59	59	61	0	2	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M29		--	Residential/B	1	140 Glenwood Circle	58	58	60	0	2	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Washington Boulevard/Andora Bridge Improvement Project Future Worst Hour Noise Levels (Traffic Noise Only) - $L_{eq}(h)$, dBA

Receiver I.D.	Measurement Location	Noise Barrier I.D.	Land Use / Activity Category	Number of Dwelling Units or Equivalent	Address	Existing Noise Level $L_{eq}(h)$, dBA	Design Year Noise Level without Project, Leq(h), dBA	Design Year Noise Level with Project, Leq(h), dBA	Design Year Noise Level without Project minus Existing Conditions Leq(h), dBA	Design Year Noise Level with Project minus No Project Conditions Leq(h), dBA	Design Year Noise Level with Project minus Existing Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type (None, or A/E)	Wall Heights																	
														6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
														$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR
M30		--	Residential/B	2	144 Glenwood Circle	54	55	57	1	2	3	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M31		--	Residential/B	1	152 Glenwood Circle	52	52	53	0	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M32		--	Residential/B	2	156 Glenwood Circle	45	46	47	1	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M33		--	Residential/B	1	164 Glenwood Circle	44	45	46	1	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M34		--	Residential/B	1	168 Glenwood Cricle	43	44	45	1	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M35		--	Residential/B	1	1284 Hawthorne Loop	54	55	55	1	0	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M36		--	Residential/B	1	1276 Hawthorne Loop	55	55	56	0	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Washington Boulevard/Andora Bridge Improvement Project Future Worst Hour Noise Levels (Traffic Noise Only) - $L_{eq}(h)$, dBA

Receiver I.D.	Measurement Location	Noise Barrier I.D.	Land Use / Activity Category	Number of Dwelling Units or Equivalent	Address	Existing Noise Level $L_{eq}(h)$, dBA	Design Year Noise Level without Project, Leq(h), dBA	Design Year Noise Level with Project, Leq(h), dBA	Design Year Noise Level without Project minus Existing Conditions Leq(h), dBA	Design Year Noise Level with Project minus No Project Conditions Leq(h), dBA	Design Year Noise Level with Project minus Existing Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type (None, or A/E)	Wall Heights																	
														6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
														$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR
M37		--	Residential/B	1	1268 Hawthorne Loop	56	56	57	0	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M38		--	Residential/B	1	1260 Hawthorne Loop	57	58	59	1	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M39		--	Residential/B	1	1252 Hawthorne Loop	57	57	58	0	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M40		--	Residential/B	2	1244 Hawthorne Loop	57	58	59	1	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M41	ST4	--	Residential/B	1	1228 Hawthorne Loop	57	58	59	1	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M42		--	Residential/B	1	1220 Hawthorne Loop	57	58	59	1	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M43		--	Residential/B	1	1212 Hawthorne Loop	57	58	58	1	0	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Washington Boulevard/Andora Bridge Improvement Project Future Worst Hour Noise Levels (Traffic Noise Only) - $L_{eq}(h)$, dBA

Receiver I.D.	Measurement Location	Noise Barrier I.D.	Land Use / Activity Category	Number of Dwelling Units or Equivalent	Address	Existing Noise Level $L_{eq}(h)$, dBA	Design Year Noise Level without Project, Leq(h), dBA	Design Year Noise Level with Project, Leq(h), dBA	Design Year Noise Level without Project minus Existing Conditions Leq(h), dBA	Design Year Noise Level with Project minus No Project Conditions Leq(h), dBA	Design Year Noise Level with Project minus Existing Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type (None, or A/E)	Wall Heights																	
														6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
														$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR
M44		--	Residential/B	1	36A Hancock Drive	63	64	64	1	0	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M45		--	Residential/B	3	35 Hancock Drive	64	65	65	1	0	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M46	ST5	--	Undeveloped Land/G	0	NA	64	65	64	1	-1	0	G (-)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M47		--	Residential/B	1	33 Hancock Drive	64	64	65	0	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M48		--	Residential/B	1	7 Stephens Court	62	62	63	0	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M49		--	Residential/B	1	6 Stephens Court	57	58	59	1	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M50		--	Residential/B	1	5 Stephens Court	60	61	62	1	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Washington Boulevard/Andora Bridge Improvement Project Future Worst Hour Noise Levels (Traffic Noise Only) - $L_{eq}(h)$, dBA

Receiver I.D.	Measurement Location	Noise Barrier I.D.	Land Use / Activity Category	Number of Dwelling Units or Equivalent	Address	Existing Noise Level $L_{eq}(h)$, dBA	Design Year Noise Level without Project, Leq(h), dBA	Design Year Noise Level with Project, Leq(h), dBA	Design Year Noise Level without Project minus Existing Conditions Leq(h), dBA	Design Year Noise Level with Project minus No Project Conditions Leq(h), dBA	Design Year Noise Level with Project minus Existing Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type (None, or A/E)	Wall Heights																
														6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
														$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR
M51		--	Residential/B	1	2 Kaseberg Drive	55	55	57	0	2	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M52		2	Residential/B	1	1 Kaseberg Drive	66	66	67	0	1	1	B (67)	A/E	67	0	0	65	2	0	62	5	1	60	7	1	58	9	1	56*	11*	1*
M53		--	Residential/B	1	323 Kaseberge Drive	63	63	65	0	2	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M54		--	Residential/B	1	316 Justin Court	63	63	64	0	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M55		--	Residential/B	2	1950 Quail Ridge W Lane	48	49	50	1	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

*Noise barriers that block the line-of-sight from the receptor to truck exhaust stacks are shaded in yellow for receptors exceeding NAC.

Appendix C Noise Barrier Analysis Worksheets

Table C-1. Analysis of Noise Barrier 1

	Receivers					Total Number of Benefited Receptors
	M16	M18	M19	M20	M21	
Number of Units Represented	1	2	2	1	1	--
Existing Traffic Noise Level (dBA L_{eq}[h])	65	66	67	65	64	--
Future with Project Traffic Noise Level (dBA Leq[h])	**67**	**68**	**68**	**68**	**67**	--
Future with Project - Existing Traffic Noise Level (dBA Leq[h])	2	2	1	3	3	--
6-Foot Barrier						
Future with Project Traffic Noise Level (dBA Leq[h])	**66**	61	61*	**67**	65	--
Predicted Noise Reduction (dB)	1	7	7*	1	2	--
Number of Benefited Receptors	0	2	2*	0	0	4
8-Foot Barrier						
Future with Project Traffic Noise Level (dBA Leq[h])	63	58*	57*	64	63	--
Predicted Noise Reduction (dB)	4	10*	11*	4	4	--
Number of Benefited Receptors	0	2*	2*	0	0	4
10-Foot Barrier						
Future with Project Traffic Noise Level (dBA Leq[h])	59	56*	55*	61	61	--
Predicted Noise Reduction (dB)	8	12*	13*	7	6	--
Number of Benefited Receptors	1	2*	2*	1	1	7
12-Foot Barrier						
Future with Project Traffic Noise Level (dBA Leq[h])	57*	54*	53*	59	58*	--
Predicted Noise Reduction (dB)	10*	14*	15*	9	9*	--
Number of Benefited Receptors	1*	2*	2*	1	1*	7
14-Foot Barrier						
Future with Project Traffic Noise Level (dBA Leq[h])	56*	53*	52*	58	56*	--
Predicted Noise Reduction (dB)	11*	15*	16*	10	11*	--
Number of Benefited Receptors	1*	2*	2*	1	1*	7
16-Foot Barrier						
Future with Project Traffic Noise Level (dBA Leq[h])	55*	52*	50*	56	55*	--
Predicted Noise Reduction (dB)	12*	16*	18*	12	12*	--
Number of Benefited Receptors	1*	2*	2*	1	1*	7

Notes:

Traffic noise levels that approach or exceed 67 dBA L_{eq}(h) are shown in bold.

*Noise barriers that block the line-of-sight from the receptor to truck exhaust stacks are shaded in yellow for receptors exceeding NAC.

Table C-2. Analysis of Noise Barrier 2

	Receiver	Total Number of Benefited Receptors
	M52	
Number of Units Represented	1	--
Existing Traffic Noise Level (dBA L_{eq}[h])	66	--
Future with Project Traffic Noise Level (dBA Leq[h])	**67**	--
Future with Project - Existing Traffic Noise Level (dBA Leq[h])	1	--
6-Foot Barrier		
Future with Project Traffic Noise Level (dBA Leq[h])	**67**	--
Predicted Noise Reduction (dB)	0	--
Number of Benefited Receptors	0	0
8-Foot Barrier		
Future with Project Traffic Noise Level (dBA Leq[h])	65	--
Predicted Noise Reduction (dB)	2	--
Number of Benefited Receptors	0	0
10-Foot Barrier		
Future with Project Traffic Noise Level (dBA Leq[h])	62	--
Predicted Noise Reduction (dB)	5	--
Number of Benefited Receptors	1	1
12-Foot Barrier		
Future with Project Traffic Noise Level (dBA Leq[h])	60	--
Predicted Noise Reduction (dB)	7	--
Number of Benefited Receptors	1	1
14-Foot Barrier		
Future with Project Traffic Noise Level (dBA Leq[h])	58	--
Predicted Noise Reduction (dB)	9	--
Number of Benefited Receptors	1	1
16-Foot Barrier		
Future with Project Traffic Noise Level (dBA Leq[h])	56*	--
Predicted Noise Reduction (dB)	11*	--
Number of Benefited Receptors	1*	1

Notes:

Traffic noise levels that approach or exceed 67 dBA L_{eq}(h) are shown in bold.

*Noise barriers that block the line-of-sight from the receptor to truck exhaust stacks are shaded in yellow for receptors exceeding NAC.

Appendix D Supplemental Data

Appendix D-1

Field Data Sheets

Traffic data was gathered simultaneously with the field noise measurements detailed in this appendix to provide the vehicle counts used in model calibration runs.

The decision regarding which local streets, if any, to count for each noise measurement was made in the field by the noise analysts performing the measurements. Streets that were not observed to contribute to the overall measured noise level were not counted. Typical reasons that a local street was found to be a negligible contributor to the overall noise level were:

- The street had a very low traffic volume; and/or,
- The street was a substantial distance from the measurement location; and/or,
- The measurement location was shielded from the street by intervening barriers such as walls or buildings.

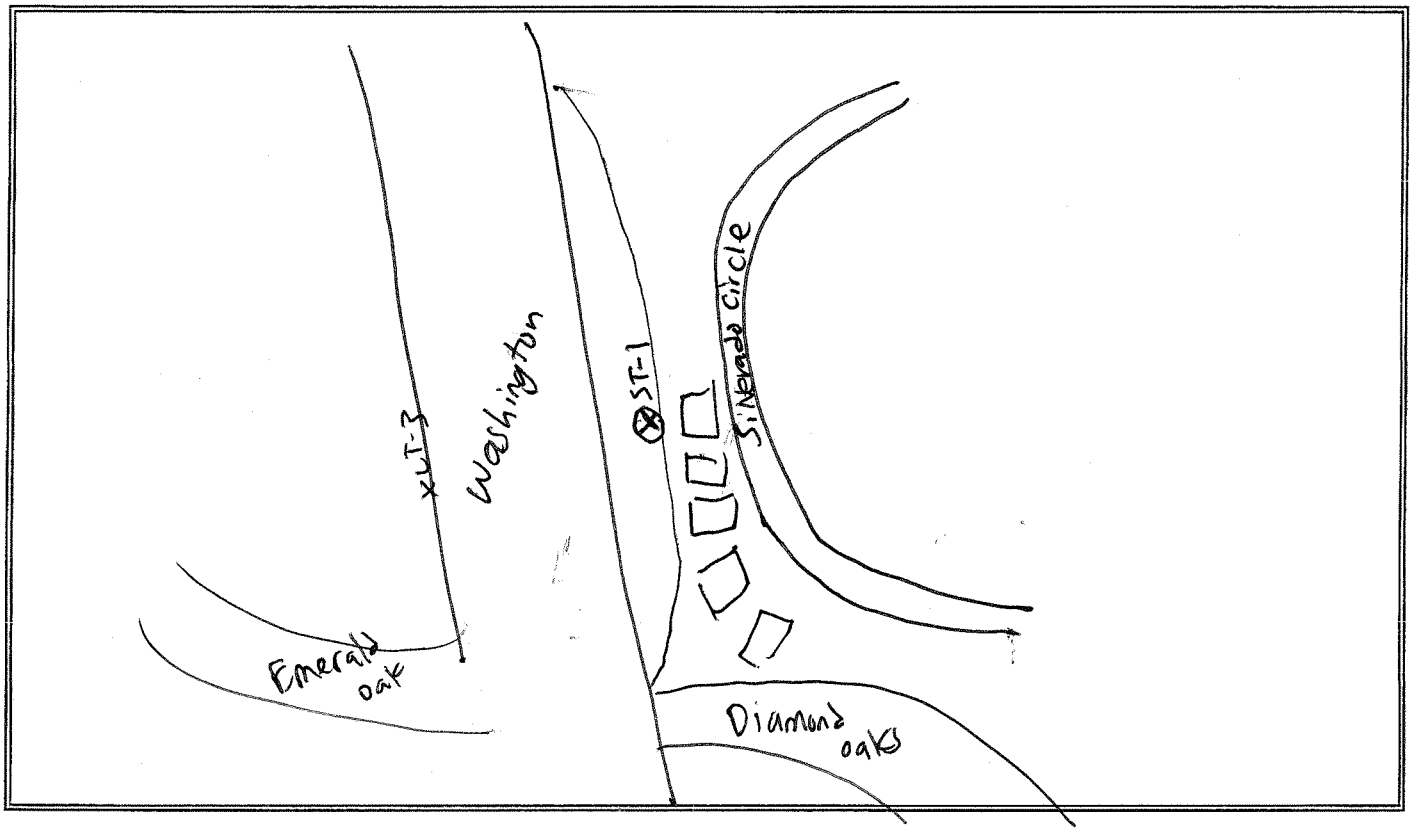
All the normalized (1-hour) calibration traffic data for this NSR is summarized in the body of the report, in Table 6-1.

NOISE MEASUREMENT SITE INFORMATION SHEET

Jones & Stokes

PROJECT NAME: Andora towashington
PROJECT #:
SITE NUMBER: ST-1a
DATE/TIME: 9/27 - 12:40
LOCATION/ADDRESS: behind Silverado Circle
ENGINEERS: E. Scott & C. Matsui

SITE SKETCH: Show microphone location, nearby residences/buildings, potential reflective surfaces, project roadways, local roadways, driveways, ground type, trees. Indicate reference distances between objects, arrows showing wind direction, North, and camera locations/directions. Describe the line-of-sight and topography/elevation changes relative to noise sources.



WEATHER DATA: (temperature, wind speed/direction, sky conditions, relative humidity)

1.2mph Avg, Sunny/clear, 21.5%RH, 96°F

EQUIPMENT DATA: (sound level meter, microphone, preamp, calibrator, factory cal. date)

LD-LXT, Cal 200

ESTIMATED CONSTRUCTION DATE OF RESIDENCES: (Pre-1978, or new construction)

POSTED SPEED: COMMENTS:

TRAFFIC COUNTS:

Roadway/Direction	Autos	Medium	Heavy	Motor	Speed	Start Time	Duration
Washington NB	179	1	1	2	35-40 mph		
Washington SB	163	6	1	0	35-40		

NOISE MEASUREMENT LOG SHEET (20)

Jones & Stokes

PROJECT NAME: _____ PROJECT #: _____

SITE NUMBER: ST-1a DATE/TIME: 12:40 p.m 9/27

LOCATION/ADDRESS: behind Silverado circle ENGINEERS: E. Scott & C. Matsui

#	Minute Starting	Measured Leq (dBA)	O or X	Autos	Medium Trucks	Heavy Trucks	Other Noise Sources/Comments (include SLM equipment, Calibration Data)
1							
2							faint weed wacker @ 2:30
3							
4							watering plants behind me @ 3:50 w/hose
5							
6							
7							
8							
9							
10							Dog Barking in far background around 9:10
11							9:55
12							
13							
14							Leq 68.3
15							Lmax 81.1
16							Lmin 45.2
17							L10
18							L33
19							L50
20							L90

post lawn mower in background starting @ 5:50

~of weed wacker

Overall Leq (Include "O" minutes, Exclude "X" minutes) = 68.3 dBA

Subset Leq (Exclude "O" and "X" minutes) = _____ dBA

"O" = other characteristic sources that contributed to the Leq

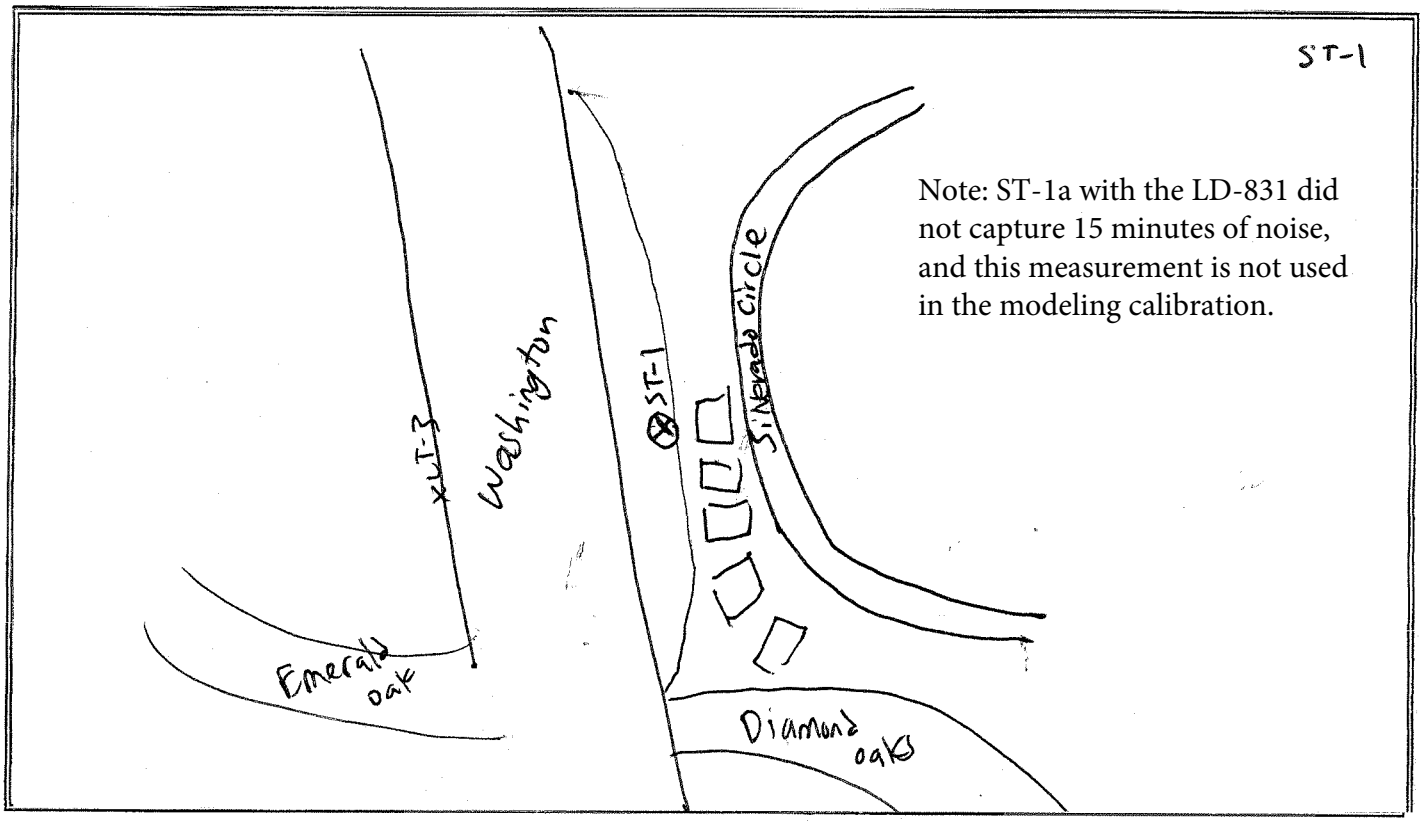
"X" = exclude from Leq calculation; a non-typical source contaminated the measurement

NOISE MEASUREMENT SITE INFORMATION SHEET

Jones & Stokes

PROJECT NAME: Andora to Washington
PROJECT #:
SITE NUMBER: ST-1b
DATE/TIME: 12:40 pm / 9/27/2016
LOCATION/ADDRESS: behind Silverado circle
ENGINEERS: E. Scott & C. Matsui

SITE SKETCH: Show microphone location, nearby residences/buildings, potential reflective surfaces, project roadways, local roadways, driveways, ground type, trees. Indicate reference distances between objects, arrows showing wind direction, North, and camera locations/directions. Describe the line-of-sight and topography/elevation changes relative to noise sources.



Note: ST-1a with the LD-831 did not capture 15 minutes of noise, and this measurement is not used in the modeling calibration.

WEATHER DATA: (temperature, wind speed/direction, sky conditions, relative humidity)

1.2mph winds, Sunny/clear, 21.5%RH, 96°F

EQUIPMENT DATA: (sound level meter, microphone, preamp, calibrator, factory cal. date)

LD-831, Cal 200

ESTIMATED CONSTRUCTION DATE OF RESIDENCES: (Pre-1978, or new construction)

POSTED SPEED: COMMENTS:

TRAFFIC COUNTS:

Roadway/Direction	Autos	Medium	Heavy	Motor	Speed	Start Time	Duration
Washington NB	179	1	1	2	35-40		
Washington SB	163	6	1	0	35-40 mph		

NOISE MEASUREMENT LOG SHEET (20)

Jones & Stokes

PROJECT NAME: _____ PROJECT #: _____

SITE NUMBER: ST-161 DATE/TIME: 1:10pm, 9/27/16

LOCATION/ADDRESS: Behind Silverado Court ENGINEERS: B. Scott & C. Matsui

#	Minute Starting	Measured Leq (dBA)	O or X	Autos	Medium Trucks	Heavy Trucks	Other Noise Sources/Comments (include SLM equipment, Calibration Data)
1							
2							faint
3							weed wacker @ 2:30
4							watering plants behind me @ 3:50 w/hose
5							
6							
7							
8							
9							
10							Dog Barking in far background around 9:10
11							↓ 9:55
12							
13							
14							Leq 68.2
15							Lmax 81.0
16							Lmin 47.8
17							L10
18							L33
19							L50
20							L90

Overall Leq (Include "O" minutes, Exclude "X" minutes) = 68.2 dBA

Subset Leq (Exclude "O" and "X" minutes) = _____ dBA

"O" = other characteristic sources that contributed to the Leq

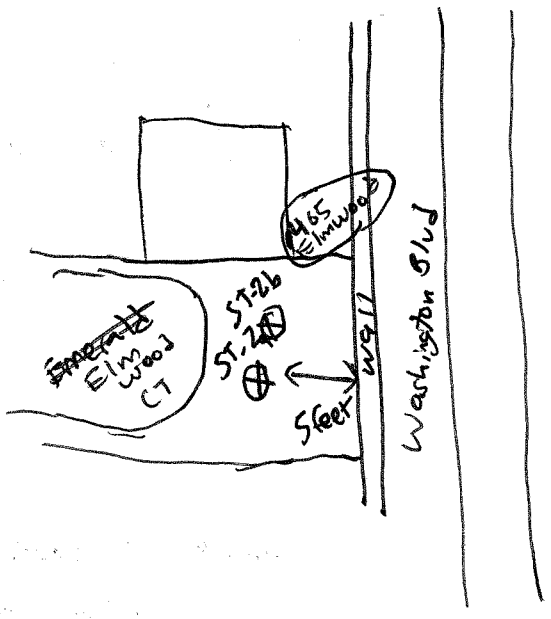
"X" = exclude from Leq calculation; a non-typical source contaminated the measurement

NOISE MEASUREMENT SITE INFORMATION SHEET

Jones & Stokes

PROJECT NAME: Andora to Washington
PROJECT #:
SITE NUMBER: ST-2a
DATE/TIME: 9/27/16 ~ 11:50
LOCATION/ADDRESS: Elmwood CT (near 465)
ENGINEERS: E. Scott & C. Matsui

SITE SKETCH: Show microphone location, nearby residences/buildings, potential reflective surfaces, project roadways, local roadways, driveways, ground type, trees. Indicate reference distances between objects, arrows showing wind direction, North, and camera locations/directions. Describe the line-of-sight and topography/elevation changes relative to noise sources.



WEATHER DATA: (temperature, wind speed/direction, sky conditions, relative humidity)

2.2 mph wind, 88°F, sunny, clear, 32% RH

EQUIPMENT DATA: (sound level meter, microphone, preamp, calibrator, factory cal. date)

LD, LXT, Cal 200

ESTIMATED CONSTRUCTION DATE OF RESIDENCES: (Pre-1978, or new construction) new

POSTED SPEED: _____ COMMENTS: _____

TRAFFIC COUNTS:

Roadway/Direction	Bus	Autos	Medium	Heavy	Moto	Speed	Start Time	Duration
Washington NB	1	154	1	4	1	40 mph		
Washington SB	0	144	0	1	3			

NOISE MEASUREMENT LOG SHEET (20)

Jones & Stokes

PROJECT NAME: Andora to Washington. PROJECT #:

SITE NUMBER: ST-2 a DATE/TIME: 9/27 - 11:50

LOCATION/ADDRESS: 465 Elmwood CT ENGINEERS: F. Scott & C. Matsui

#	Minute Starting	Measured Leq (dBA)	O or X	Autos	Medium Trucks	Heavy Trucks	Other Noise Sources/Comments (include SLM equipment, Calibration Data)
1							
2							
3							3:50 music from vehicle & motorcycle revving
4							
5							
6							
7							
8							
9							
10							minute ~10, truck drove up Elmwood CT.
11							~10:25 car door slam
12							
13							~12:50 motorcycle revving
14							~13:05 car door slam & car back out near me
15							~13:30 same car accelerate away
16							
17							
18							
19							
20							

Leq	56.4
Lmax	78.0
Lmin	38.2
L10	
L33	
L50	
L90	

Overall Leq (Include "O" minutes, Exclude "X" minutes) = 56.4 dBA

Subset Leq (Exclude "O" and "X" minutes) = dBA

"O" = other characteristic sources that contributed to the Leq

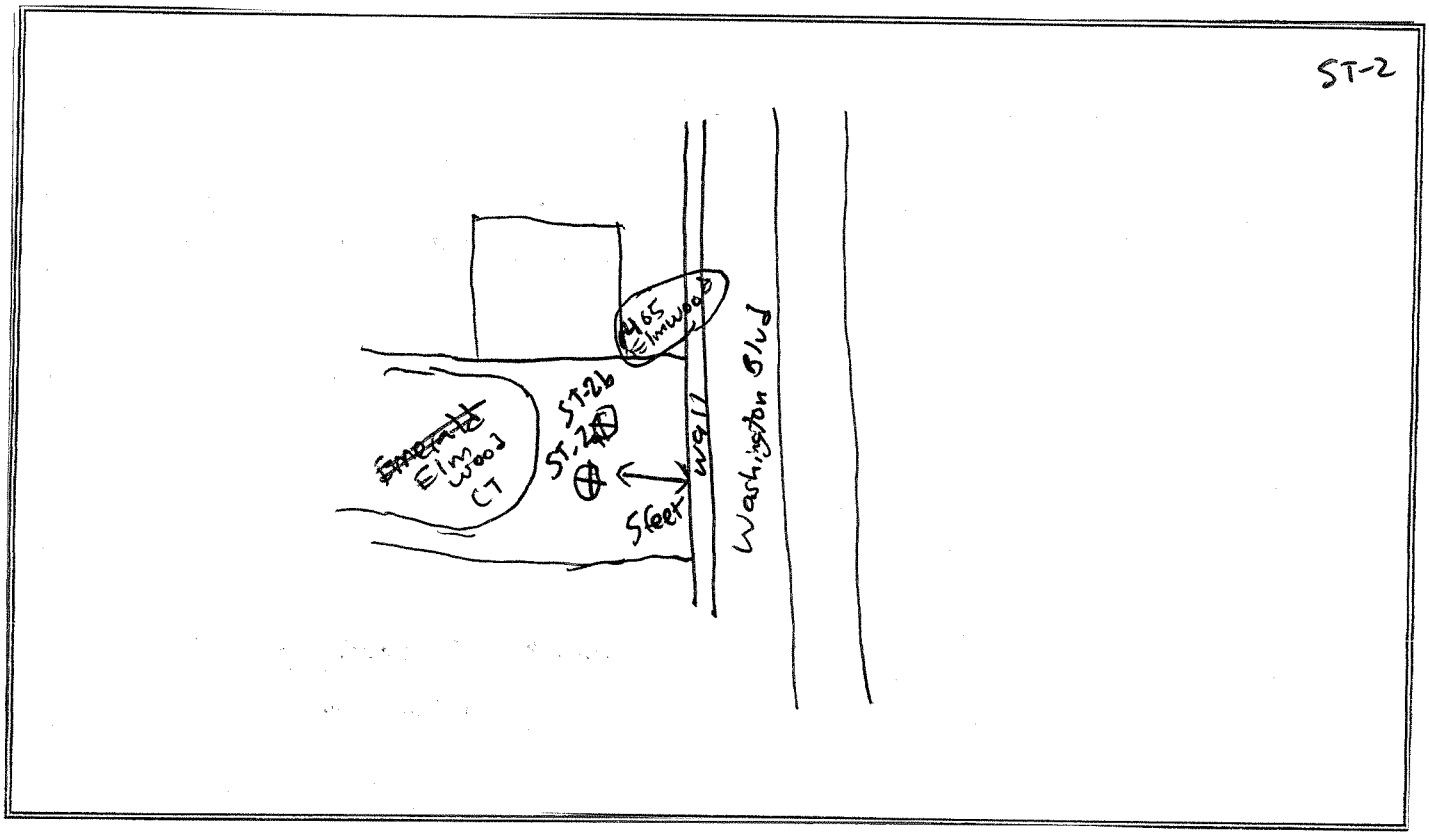
"X" = exclude from Leq calculation; a non-typical source contaminated the measurement

NOISE MEASUREMENT SITE INFORMATION SHEET

Jones & Stokes

PROJECT NAME: Andorato Washington
PROJECT #:
SITE NUMBER: ST-26
DATE/TIME: 9/27/16 - 11:50
LOCATION/ADDRESS: 465 Elmwood CT
ENGINEERS: E. Scott & C. Matsui

SITE SKETCH: Show microphone location, nearby residences/buildings, potential reflective surfaces, project roadways, local roadways, driveways, ground type, trees. Indicate reference distances between objects, arrows showing wind direction, North, and camera locations/directions. Describe the line-of-sight and topography/elevation changes relative to noise sources.



WEATHER DATA: (temperature, wind speed/direction, sky conditions, relative humidity)

2.2 mph, 88°F, sunny/clear, 32% RH

EQUIPMENT DATA: (sound level meter, microphone, preamp, calibrator, factory cal. date)

LD-831, cal 200

ESTIMATED CONSTRUCTION DATE OF RESIDENCES: (Pre-1978, or new construction) New

POSTED SPEED: _____ COMMENTS: _____

TRAFFIC COUNTS:

Roadway/Direction	Buses	Autos	Medium	Heavy	Motor	Speed	Start Time	Duration
Washington NB	1	154	1	4	1	40mph		
Washington SB	0	144	0	1	3			

NOISE MEASUREMENT LOG SHEET (20)

Jones & Stokes

PROJECT NAME: Anderato Washington
PROJECT #:
SITE NUMBER: ST-26
DATE/TIME: 9/27/16 – 11:50
LOCATION/ADDRESS: 465 Elmwood CT
ENGINEERS: B. Scott & C. Matsui

#	Minute Starting	Measured Leq (dBA)	O or X	Autos	Medium Trucks	Heavy Trucks	Other Noise Sources/Comments (include SLM equipment, Calibration Data)
1							
2							
3							3:50 music from vehicle & moto revving
4							
5							
6							
7							
8							
9							
10							minute ~10, truck drove up Elmwood Ct.
11							~ 10:25 car door slam
12							~12:50 moto revving
13							~13:05 car door slam & car back out near me
14							~13:30: same car accelerate away
15							
16							
17							
18							
19							
20							

Leq	56.7
Lmax	75.7
Lmin	38.6
L10	
L33	
L50	
L90	

Overall Leq (Include "O" minutes, Exclude "X" minutes) = 56.7 dBA

Subset Leq (Exclude "O" and "X" minutes) = dBA

"O" = other characteristic sources that contributed to the Leq

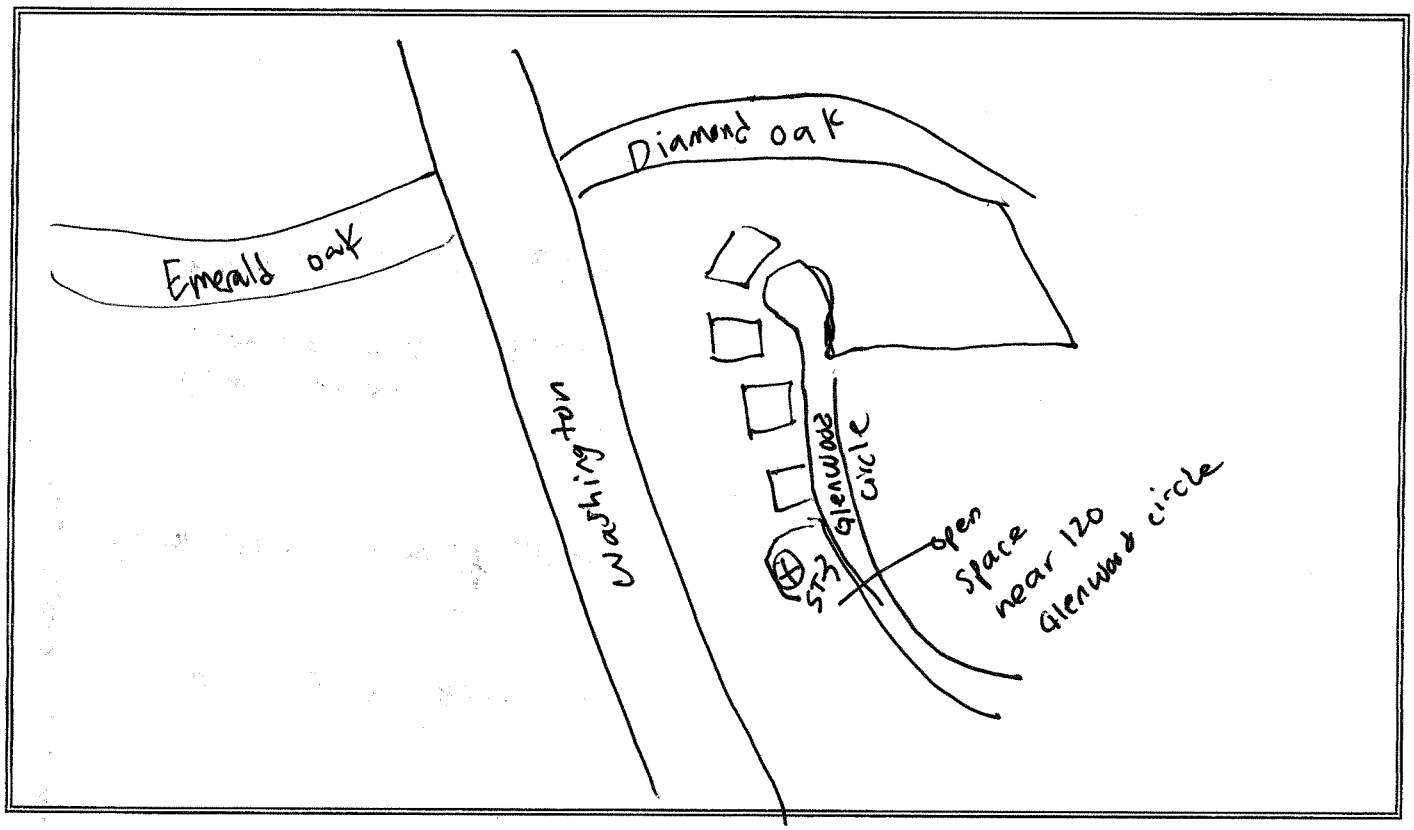
"X" = exclude from Leq calculation; a non-typical source contaminated the measurement

NOISE MEASUREMENT SITE INFORMATION SHEET

Jones & Stokes

PROJECT NAME: andora to Washington
PROJECT #:
SITE NUMBER: ST-3 a
DATE/TIME: 2:45
LOCATION/ADDRESS: near 120 glenwood circle
ENGINEERS: E. Scott & C. Matsui

SITE SKETCH: Show microphone location, nearby residences/buildings, potential reflective surfaces, project roadways, local roadways, driveways, ground type, trees. Indicate reference distances between objects, arrows showing wind direction, North, and camera locations/directions. Describe the line-of-sight and topography/elevation changes relative to noise sources.



WEATHER DATA: (temperature, wind speed/direction, sky conditions, relative humidity)

91°F, 31% RH, Sunny/clear, 0mph wind

EQUIPMENT DATA: (sound level meter, microphone, preamp, calibrator, factory cal. date)

LD-Lxt, Cal 200

ESTIMATED CONSTRUCTION DATE OF RESIDENCES: (Pre-1978, or new construction) new-ish

POSTED SPEED: _____ COMMENTS: _____

TRAFFIC COUNTS:

Roadway/Direction	Motor	Autos	Medium	Heavy	Bus	Speed	Start Time	Duration
NB Washington	0	215	0	0	0			
SB Washington	0	227	2	0	2			

NOISE MEASUREMENT LOG SHEET (20)

Jones & Stokes

PROJECT NAME: Ardora to Washington
PROJECT #:
SITE NUMBER: ST-3a
DATE/TIME: 2:45 / 9/27/2016
LOCATION/ADDRESS: near 120 glenwood circle
ENGINEERS: C. Marbut & E. Scott

#	Minute Starting	Measured Leq (dBA)	O or X	Autos	Medium Trucks	Heavy Trucks	Other Noise Sources/Comments (include SLM equipment, Calibration Data)
1							
2							
3							
4							~4:30 = leaves rustleling
5							~5:35 = noise of door closing near by
6							
7							
8							- leaves rustled a little louder
9							
10							
11							leaves rustled a little louder
12							
13							
14							
15							
16							
17							
18							
19							
20							note: sound wall between noise & traffic

Leq	54.8
Lmax	62.6
Lmin	42.6
L10	
L33	
L50	
L90	

leaves rustled intermittently throughout measurement, but relatively quiet

Overall Leq (Include "O" minutes, Exclude "X" minutes)	=	54.8	dBA
Subset Leq (Exclude "O" and "X" minutes)	=		dBA

"O" = other characteristic sources that contributed to the Leq

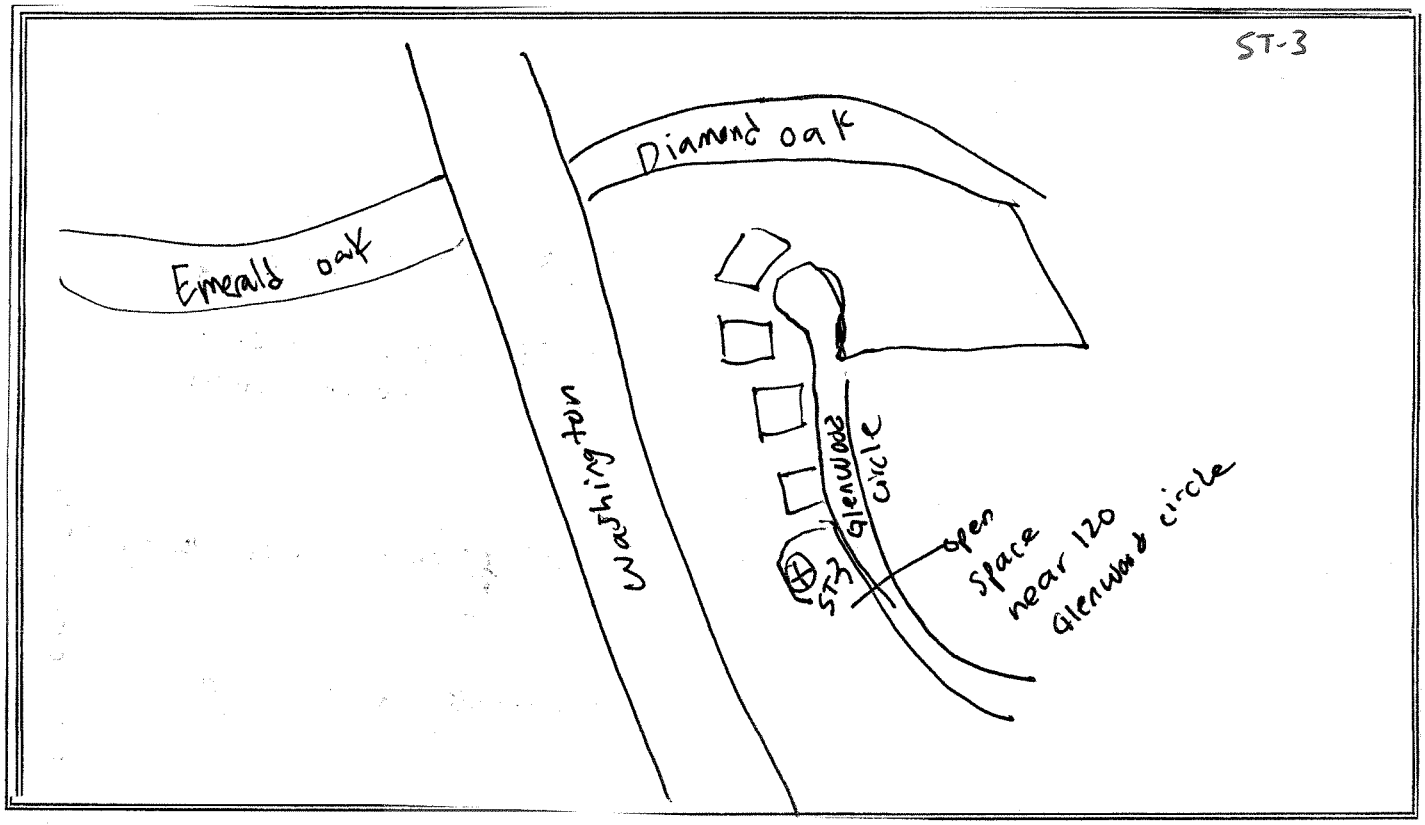
"X" = exclude from Leq calculation; a non-typical source contaminated the measurement

NOISE MEASUREMENT SITE INFORMATION SHEET

Jones & Stokes

PROJECT NAME: Andorato Washington
PROJECT #:
SITE NUMBER: ST-3b
DATE/TIME: ~2:45 / 9/27/2016
LOCATION/ADDRESS: Near 120 glenwood circle
ENGINEERS: C. Matsui & E Scott

SITE SKETCH: Show microphone location, nearby residences/buildings, potential reflective surfaces, project roadways, local roadways, driveways, ground type, trees. Indicate reference distances between objects, arrows showing wind direction, North, and camera locations/directions. Describe the line-of-sight and topography/elevation changes relative to noise sources.



WEATHER DATA: (temperature, wind speed/direction, sky conditions, relative humidity)

EQUIPMENT DATA: (sound level meter, microphone, preamp, calibrator, factory cal. date)

LD-831

ESTIMATED CONSTRUCTION DATE OF RESIDENCES: (Pre-1978, or new construction)

POSTED SPEED: COMMENTS:

TRAFFIC COUNTS:

Roadway/Direction	Motor	Autos	Medium	Heavy	Bus	Speed	Start Time	Duration
NB Washington	Ø	215	Ø	Ø	Ø			
SB Washington	Ø	227	2	Ø	2			

NOISE MEASUREMENT LOG SHEET (20)

Jones & Stokes

PROJECT NAME: Andora to Washington
PROJECT #:
SITE NUMBER: St-36
DATE/TIME: 2:45 / 9/27/2016
LOCATION/ADDRESS: near 120 Glenwood Circle
ENGINEERS: C. Matsui & E. Scott

#	Minute Starting	Measured Leq (dBA)	O or X	Autos	Medium Trucks	Heavy Trucks	Other Noise Sources/Comments (include SLM equipment, Calibration Data)
1							
2							
3							
4							~4:30=leaves rustle
5							~5:35 - noise of car door closing near by
6							
7							
8							-leaves rustled a little louder
9							
10							
11							-leaves rustle a little louder
12							
13							
14							
15							
16							
17							
18							
19							
20							note: Sound wall between meter & traffic

Leq	55.2
Lmax	64.0
Lmin	43.0
L10	
L33	
L50	
L90	

Leaves rustled (but relatively quiet) throughout measurement

Overall Leq (Include "O" minutes, Exclude "X" minutes) = 55.2 dBA

Subset Leq (Exclude "O" and "X" minutes) = dBA

"O" = other characteristic sources that contributed to the Leq

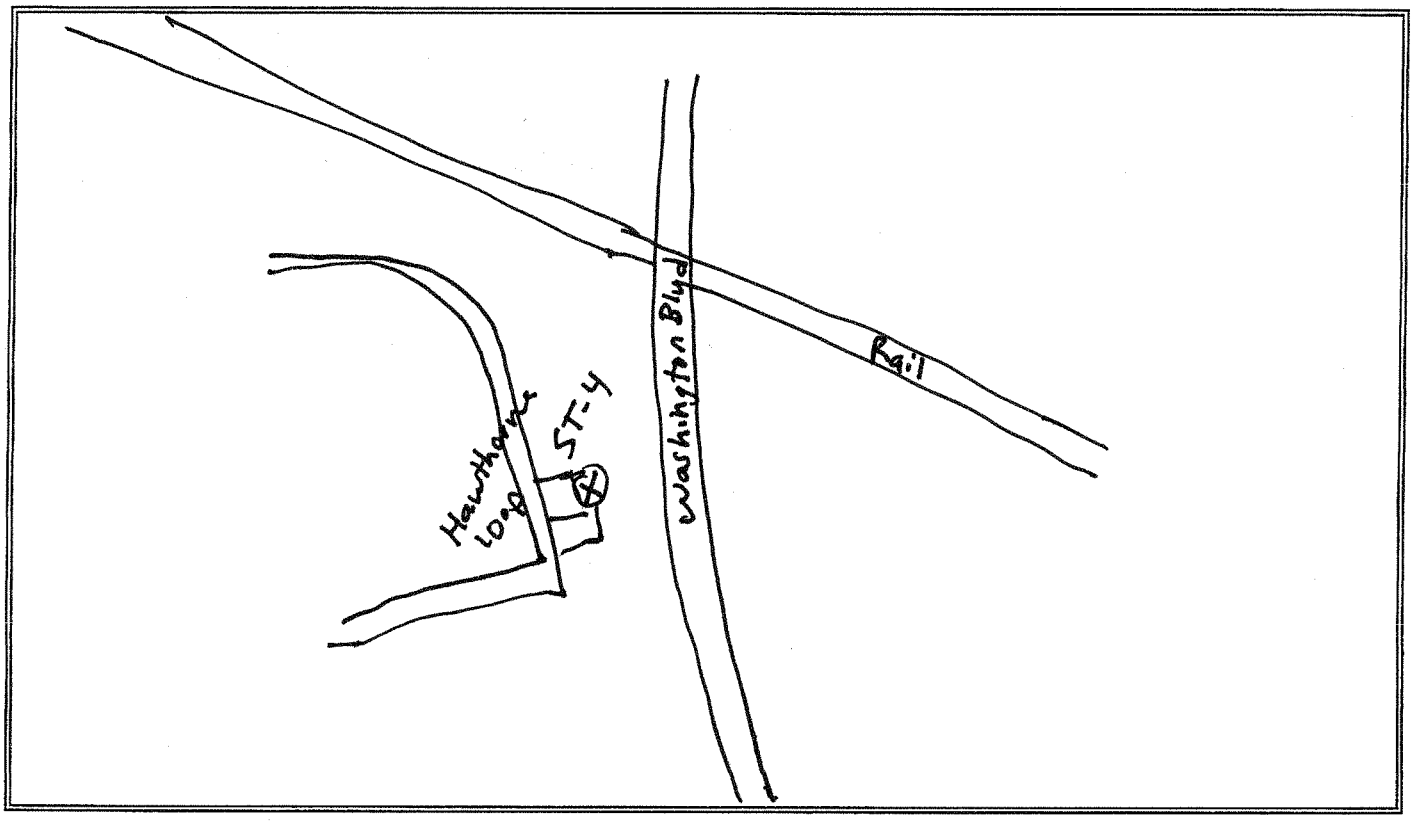
"X" = exclude from Leq calculation; a non-typical source contaminated the measurement

NOISE MEASUREMENT SITE INFORMATION SHEET

Jones & Stokes

PROJECT NAME: Washington to Andora
PROJECT #:
SITE NUMBER: ST-4a
DATE/TIME: 9/27/16
LOCATION/ADDRESS: 1228 Hawthorne
ENGINEERS: E. Scott & C Matsui

SITE SKETCH: Show microphone location, nearby residences/buildings, potential reflective surfaces, project roadways, local roadways, driveways, ground type, trees. Indicate reference distances between objects, arrows showing wind direction, North, and camera locations/directions. Describe the line-of-sight and topography/elevation changes relative to noise sources.



WEATHER DATA: (temperature, wind speed/direction, sky conditions, relative humidity)

1mph wind, 27% humidity, clear sky/sunny, 84°F (meter read 91) but think it was wrong

EQUIPMENT DATA: (sound level meter, microphone, preamp, calibrator, factory cal. date)

LD-LxT, CAL 200 (sn 4594)

ESTIMATED CONSTRUCTION DATE OF RESIDENCES: (Pre-1978, or new construction) new

POSTED SPEED: COMMENTS:

TRAFFIC COUNTS:

Roadway/Direction	Autos	Medium	Heavy	m/h	Speed	Start Time	Duration
Washington NB	113	1	1	4	35-43 mph		
Washington SB	119	2	2	1			

NOISE MEASUREMENT LOG SHEET (20)

Jones & Stokes

PROJECT NAME: Washington to Andorra Widening
PROJECT #:
SITE NUMBER: ST-4 a
DATE/TIME: 9/27/16 / 10:55 a.m.
LOCATION/ADDRESS: 1228 Hawthorne loop
ENGINEERS: E. Scott & C. Matsui

#	Minute Starting	Measured Leq (dBA)	O or X	Autos	Medium Trucks	Heavy Trucks	Other Noise Sources/Comments (include SLM equipment, Calibration Data)
1							plane during minute 1 (around 50 seconds)
2							
3							Bird chirp around 2:20
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							13:40 = loud Bird squak
14							Leq 49.9
15							Lmax 65.8
16							Lmin 39.5
17							L10
18							L33
19							L50
20							L90

Overall Leq (Include "O" minutes, Exclude "X" minutes) = 49.9 dBA

Subset Leq (Exclude "O" and "X" minutes) = dBA

"O" = other characteristic sources that contributed to the Leq

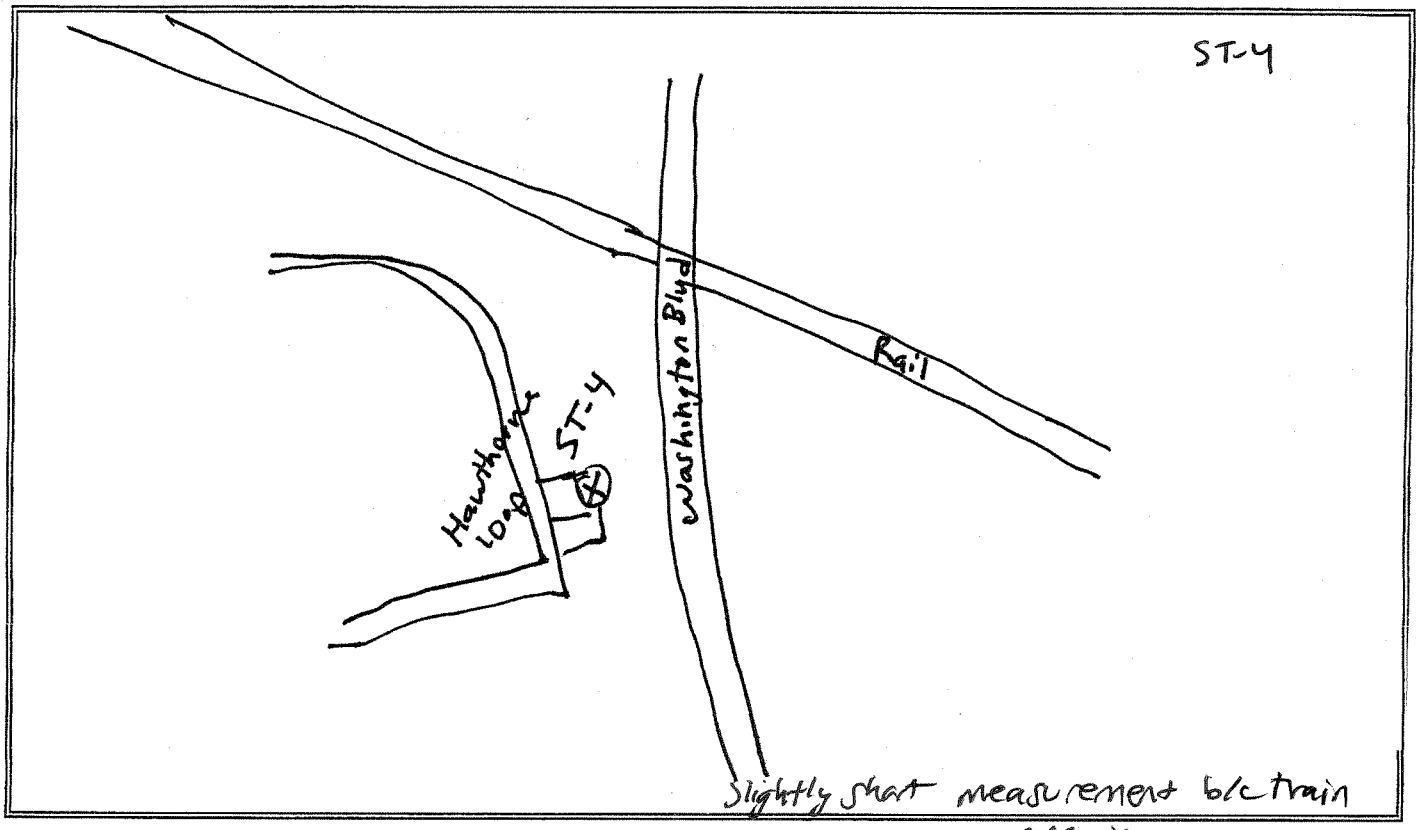
"X" = exclude from Leq calculation; a non-typical source contaminated the measurement

NOISE MEASUREMENT SITE INFORMATION SHEET

Jones & Stokes

PROJECT NAME: Washington to Anderson
PROJECT #:
SITE NUMBER: ST-4b
DATE/TIME: 9/27/2016
LOCATION/ADDRESS: 1228 Hawthorne
ENGINEERS: E. Scott & C. Matsui

SITE SKETCH: Show microphone location, nearby residences/buildings, potential reflective surfaces, project roadways, local roadways, driveways, ground type, trees. Indicate reference distances between objects, arrows showing wind direction, North, and camera locations/directions. Describe the line-of-sight and topography/elevation changes relative to noise sources.



WEATHER DATA: (temperature, wind speed/direction, sky conditions, relative humidity)

1 mph wind, 27% humidity, clear sky/sunny, 84°F

EQUIPMENT DATA: (sound level meter, microphone, preamp, calibrator, factory cal. date)

LD 831, CaL 200 (SN 4594)

ESTIMATED CONSTRUCTION DATE OF RESIDENCES: (Pre-1978, or new construction) new

POSTED SPEED: _____ COMMENTS: _____

TRAFFIC COUNTS:

Roadway/Direction	Autos	Medium	Heavy	Moto	Speed	Start Time	Duration
Washington NB	113	1	1	4	35-43 mph		
Washington SB	119	2	2	1			

NOISE MEASUREMENT LOG SHEET (20)

Jones & Stokes

PROJECT NAME: Washington to Andorg
PROJECT #:
SITE NUMBER: ST-46
DATE/TIME: 9/27/16 / 10:55 am
LOCATION/ADDRESS: 1228 Hawthorne Loop
ENGINEERS: E. Scott & C. Matsui

#	Minute Starting	Measured Leq (dBA)	O or X	Autos	Medium Trucks	Heavy Trucks	Other Noise Sources/Comments (include SLM equipment, Calibration Data)
1							Plane during minute 1 (around 50 seconds)
2							
3							Bird around 2:20 (loud chirp)
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							13:40 loud Bird Squeak
15							
16							
17							
18							
19							
20							

low level of bird chirping noise throughout

Leq	50.1
Lmax	68.8
Lmin	39.7
L10	
L33	
L50	
L90	

Overall Leq (Include "O" minutes, Exclude "X" minutes) = 50.1 dBA

Subset Leq (Exclude "O" and "X" minutes) = dBA

"O" = other characteristic sources that contributed to the Leq

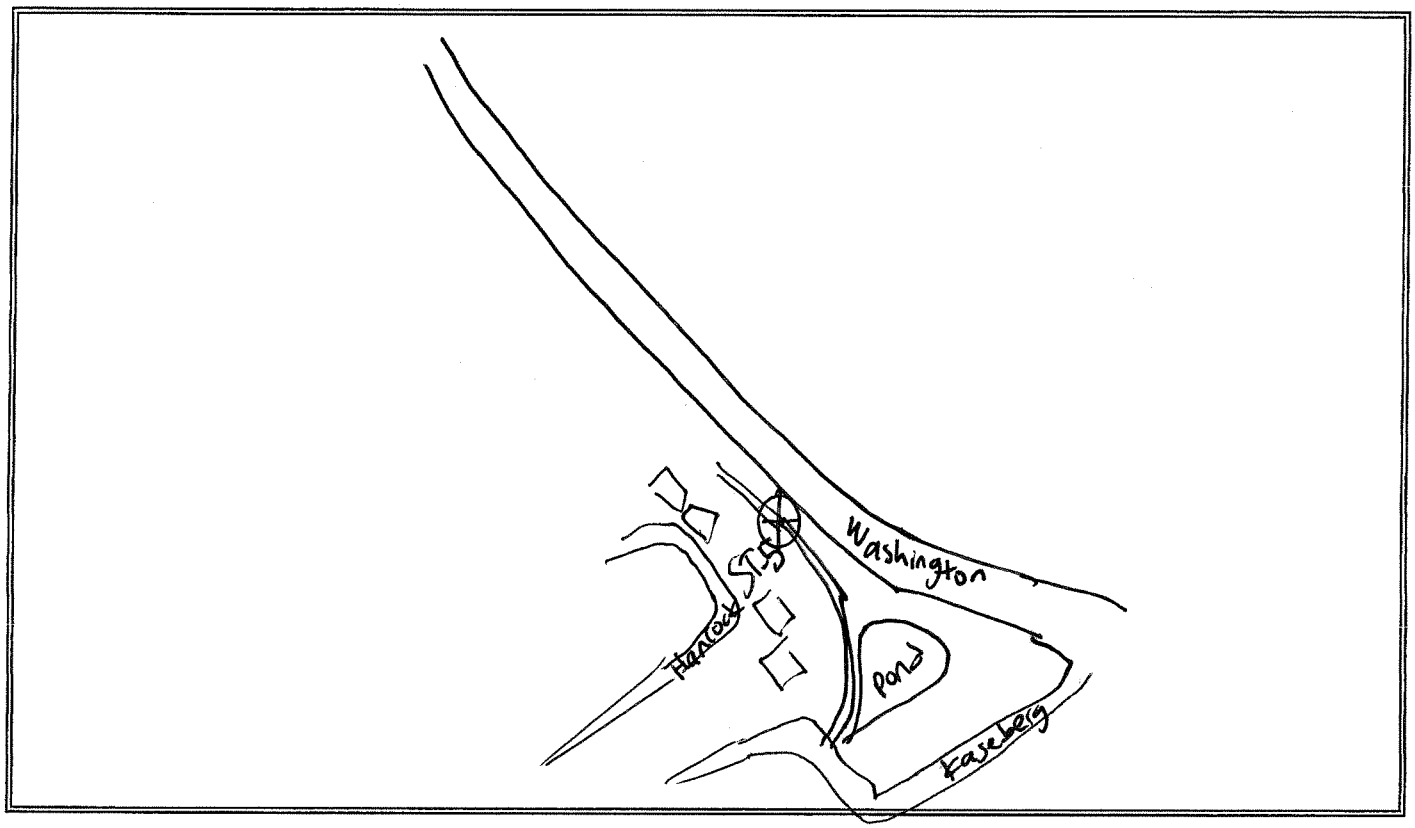
"X" = exclude from Leq calculation; a non-typical source contaminated the measurement

NOISE MEASUREMENT SITE INFORMATION SHEET

Jones & Stokes

PROJECT NAME: andorato Washington
PROJECT #:
SITE NUMBER: ST-5a
DATE/TIME: 3:35 / 9/27/2016
LOCATION/ADDRESS: off Kaseberg near pond/trail
ENGINEERS: E. Scott & C. Matsui

SITE SKETCH: Show microphone location, nearby residences/buildings, potential reflective surfaces, project roadways, local roadways, driveways, ground type, trees. Indicate reference distances between objects, arrows showing wind direction, North, and camera locations/directions. Describe the line-of-sight and topography/elevation changes relative to noise sources.



WEATHER DATA: (temperature, wind speed/direction, sky conditions, relative humidity)

94 °F, 1.3 mph winds, sunny/clear, 23.3% RH

EQUIPMENT DATA: (sound level meter, microphone, preamp, calibrator, factory cal. date)

LD-LXT, Cal 200

ESTIMATED CONSTRUCTION DATE OF RESIDENCES: (Pre-1978, or new construction) double wide/mobile homes

POSTED SPEED: _____ COMMENTS: _____

TRAFFIC COUNTS:

Roadway/Direction	Moto	Autos	Medium	Heavy	Bus	Speed	Start Time	Duration
Wash NB	0	250	1	0	2	35-40 mph		
Wash SB	4	199	0	0	0			

NOISE MEASUREMENT LOG SHEET (20)

Jones & Stokes

PROJECT NAME: Andora to Washington
PROJECT #:
SITE NUMBER: ST-5a
DATE/TIME: 3:35 / 9/27/2016
LOCATION/ADDRESS: off Kaseberg near trail/pond
ENGINEERS: E. Scott & C. Matsui

#	Minute Starting	Measured Leq (dBA)	O or X	Autos	Medium Trucks	Heavy Trucks	Other Noise Sources/Comments (include SLM equipment, Calibration Data)
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							Leq 59.8
15							Lmax 73.2
16							Lmin 40.0
17							L10
18							L33
19							L50
20							L90

Overall Leq (Include "O" minutes, Exclude "X" minutes) = 59.9 **dBA**

Subset Leq (Exclude "O" and "X" minutes) = **dBA**

"O" = other characteristic sources that contributed to the Leq

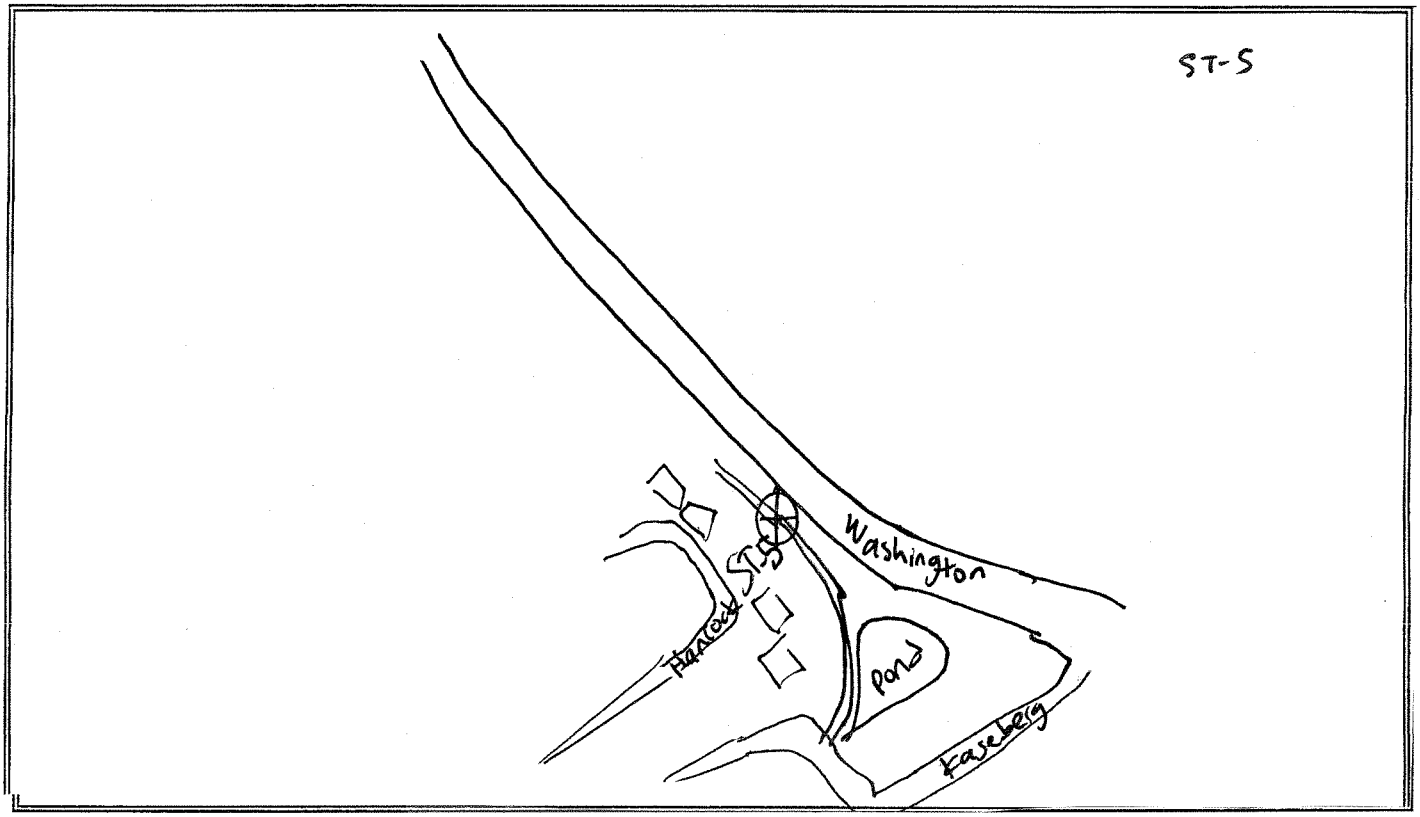
"X" = exclude from Leq calculation; a non-typical source contaminated the measurement

NOISE MEASUREMENT SITE INFORMATION SHEET

Jones & Stokes

PROJECT NAME: Andora to Washington
PROJECT #:
SITE NUMBER: ST-5b
DATE/TIME: 3:35ish
LOCATION/ADDRESS: off Kaseberg near trail/pond
ENGINEERS: E. Scott & C. Matsui

SITE SKETCH: Show microphone location, nearby residences/buildings, potential reflective surfaces, project roadways, local roadways, driveways, ground type, trees. Indicate reference distances between objects, arrows showing wind direction, North, and camera locations/directions. Describe the line-of-sight and topography/elevation changes relative to noise sources.



WEATHER DATA: (temperature, wind speed/direction, sky conditions, relative humidity)

94°F, 1.3 mph winds, 23.3% RH, Sunny/clear

EQUIPMENT DATA: (sound level meter, microphone, preamp, calibrator, factory cal. date)

LD-831, cal 200

ESTIMATED CONSTRUCTION DATE OF RESIDENCES: (Pre-1978, or new construction) double wide/mobile homes

POSTED SPEED: _____ COMMENTS: _____

TRAFFIC COUNTS:

Roadway/Direction	Moto	Autos	Medium	Heavy	Bus	Speed	Start Time	Duration
Wash NB	Ø	250	1	Ø	2			
Wash SB	4	197	Ø	Ø	Ø			

NOISE MEASUREMENT LOG SHEET (20)

Jones & Stokes

PROJECT NAME: Andora to Washington
PROJECT #:
SITE NUMBER: ST-5b
DATE/TIME: 3:35 / 9/27/2016
LOCATION/ADDRESS: behind mobile homes near Pond
ENGINEERS: E. Scott & C. Matsui

#	Minute Starting	Measured Leq (dBA)	O or X	Autos	Medium Trucks	Heavy Trucks	Other Noise Sources/Comments (include SLM equipment, Calibration Data)
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							Leq 59.9
15							Lmax 73.3
16							Lmin 40.2
17							L10
18							L33
19							L50
20							L90

Overall Leq (Include "O" minutes, Exclude "X" minutes) = 59.9 **dBA**

Subset Leq (Exclude "O" and "X" minutes) = **dBA**

"O" = other characteristic sources that contributed to the Leq

"X" = exclude from Leq calculation; a non-typical source contaminated the measurement

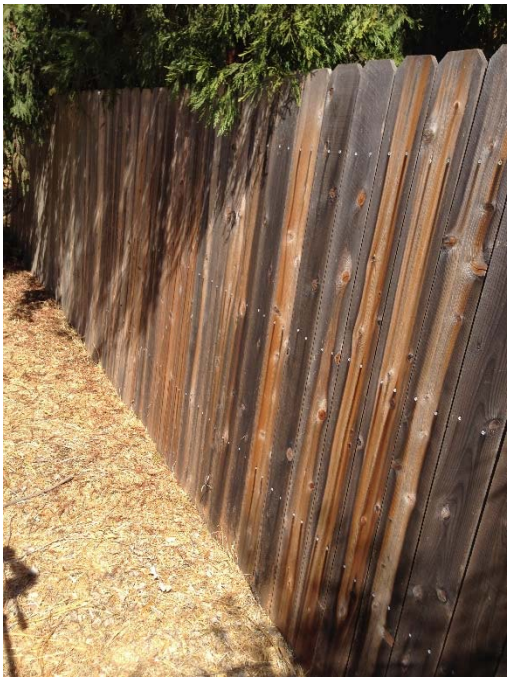
Appendix D-2

Field Photos

Photograph 1. ST1 – Camera facing north

Photograph 2. ST1 – Camera facing southwest

Photograph 3. ST1 – Camera facing west, Washington Boulevard



Photograph 4. Area near ST1 – Camera facing northeast, residential privacy fence

Photograph 5. ST2 – Camera facing northeast

Photograph 6. ST2 – Camera facing east

Photograph 7. ST2 – Camera facing north

Photograph 8. ST2 – Camera facing southeast

Photograph 9. ST3 – Camera facing west

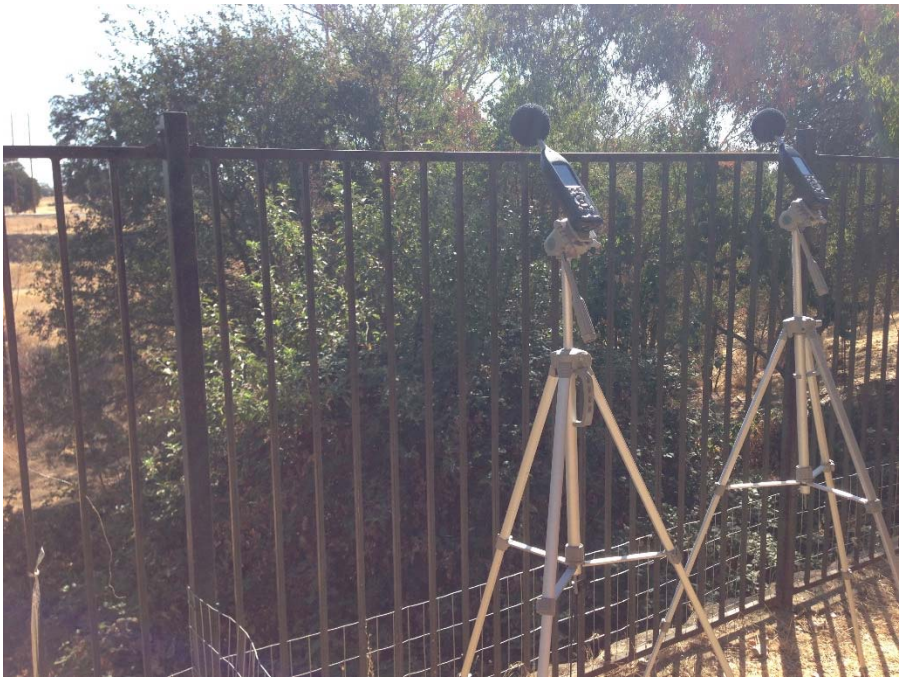
Photograph 10. ST3 – Camera facing west

Photograph 11. Area near ST3 – Camera facing southeast from meter location

Photograph 12. Area near ST3 – Camera facing east from meter location

Photograph 13. Area near ST3 – Camera facing northwest

Photograph 14. ST4 – Camera facing northeast



Photograph 15. ST4 – Camera facing southeast

Photograph 16. ST4 – Camera facing north

Photograph 17. ST4 – Camera facing east

Photograph 18. ST5 – Camera facing east

Photograph 19. ST5 – Camera facing east

Photograph 20. Area/residence near ST5 – Camera facing west from meter location

Photograph 21. LT1 – Camera facing west

Photograph 22. LT1 – Camera facing northeast

Photograph 23. LT1 – Camera facing northwest

Photograph 24. LT2 – Camera facing east

Photograph 25. LT2 – Camera facing southwest

Photograph 26. LT2 – Camera facing east

Photograph 27. LT2 – Camera facing east

Photograph 28. LT3 – Camera facing west

Photograph 29. LT3 – Camera facing southwest

Appendix E Traffic and Transportation Technical Memorandum and Data

Final Transportation Study for the

Washington / Andora Widening Project

Prepared for:

MARK THOMAS & COMPANY

CITY OF ROSEVILLE CALIFORNIA

January 24, 2017

RS16-3431

FEHR & PEERS

Table of Contents

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1. INTRODUCTION

This study analyzes the transportation impacts of the proposed Washington / Andora Widening Project ("Proposed Project"), which would widen approximately 0.75-miles of Washington Boulevard from two to four travel lanes from north of Sawtell Road/Derek Place to approximately 500 feet south of Pleasant Grove Boulevard. The study analyzes transportation conditions under Existing Conditions and Cumulative (2035) conditions.

PROJECT DESCRIPTION

The project would widen Washington Boulevard in Roseville, CA from two to four travel lanes between Sawtell Road/Derek Place and Pleasant Grove Boulevard, resulting in a continuous four-lane divided roadway. This would involve restriping and widening the roadway primarily to the east. The widening also includes improvements to the existing Union Pacific Railroad (UPRR) Andora Underpass bridge and stream culverts to accommodate the wider cross-section.

The widening would also include the following improvements to other travel modes in the corridor:

- The project would result in continuous Class II bike lanes (i.e., on-street with appropriate signing and striping) on both sides of Washington Boulevard between Sawtell Road/Derek Place and Pleasant Grove Boulevard.
- A new sidewalk and a new segment of Class I (i.e., off-street) Multi-Use Path would be constructed on the west side of the roadway between Kaseberg Drive, the Power line corridor and Diamond Oaks Road/Emerald Oak Road, thereby resulting in a continuous pedestrian facility between Sawtell Road/Derek Place and Pleasant Grove Boulevard.
- The project would expand an existing Class I (i.e., off-street) Multi-Use Path located on the east side of the roadway. After construction, it would extend parallel to Washington Boulevard from Derek Place/Sawtell Road to Pleasant Grove Boulevard, providing an alternative to the existing Class I path that connects to Derek Place.

The project would not alter the existing bus turnout located in the southbound direction of Washington Boulevard south of Pleasant Grove Boulevard.

STUDY AREA

The study area extends along the Washington Boulevard corridor from Pleasant Grove Boulevard to Junction Boulevard. The following study intersections located along the corridor were selected for study (refer to **Figure 1):**

1. Washington Boulevard/Pleasant Grove Boulevard
2. Washington Boulevard/Diamond Oaks Road
3. Washington Boulevard/Kaseberg Drive (private)
4. Washington Boulevard/Sawtell Road
5. Washington Boulevard/Junction Boulevard

Although the proposed widening would not extend through study intersections 1, 4, and 5, they were included in the study area because of the potential that the project would result in a shift in traffic away from other roadways, thereby adding traffic to these facilities.

For the analysis of temporary impacts associated with construction-related closures of Washington Boulevard, the study area has been expanded to include key intersections along Foothills Boulevard, Pleasant Grove Boulevard, and Roseville Parkway.

Figure 1 shows six elementary or middle schools located in the vicinity of the proposed widening. This figure also shows the locations of golf courses and fire stations in the vicinity. Although not shown on Figure 1, Roseville High School, which is located beyond the limits of the map at the terminus of Sierra Boulevard at Tiger Way, is frequented accessed via Washington Boulevard.

ANALYSIS SCENARIOS

The following scenarios are analyzed in this report to evaluate the effects of the proposed project:

- Existing Conditions - represents the existing setting upon which project-specific impacts are evaluated.
- Existing Plus Project Conditions - represents existing conditions with the Washington / Andora Widening Project.

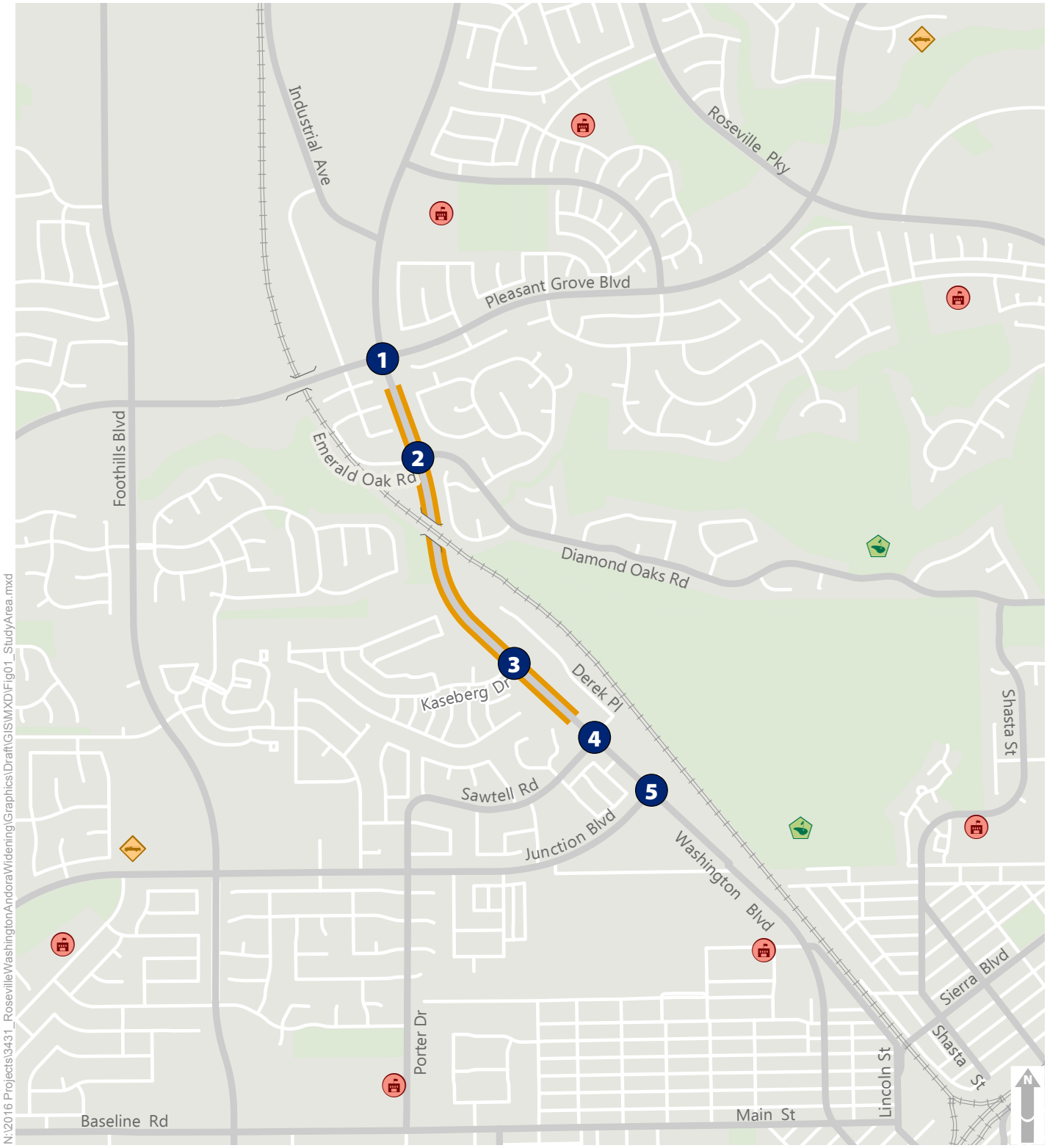


Figure 1

Study Area

- Cumulative (2035) No Project Conditions – assumes development of reasonably foreseeable land uses throughout the region, and assumes planned City of Roseville roadway system improvements but without the Washington / Andora Widening Project.
- Cumulative (2035) Plus Project Conditions – assumes Cumulative (2035) No Project conditions but with the Washington / Andora Widening Project.

This report also evaluates temporary construction-related closures of Washington Boulevard, including operational results for the two preferred options.

ANALYSIS METHODS

LEVEL OF SERVICE (LOS)

Level of Service (LOS) is a qualitative measure of traffic operating conditions whereby a letter grade, from A (the best) to F (the worst), is assigned. These grades represent the perspective of drivers and are an indication of the comfort and convenience associated with driving. In general, LOS A represents free-flow conditions with no congestion, and LOS F represents severe congestion and delay under stop-and-go conditions. **Table 1** contains information for intersection LOS criteria.

SimTraffic is micro-simulation software used to analyze the study intersections for all scenarios. Per standard practice, ten SimTraffic runs were conducted and averaged for the reported results consistent with the methodology described in the *2010 Highway Capacity Manual* (HCM). SimTraffic is appropriate for this analysis because it accounts for queue spillbacks, considers the effect of coordinated signal timing along Pleasant Grove Boulevard, and appropriately assigns delay to bottleneck intersections.

For signalized intersections, the average delay and LOS is reported for the weighted average of all movements at the intersection. For side-street stop-controlled intersections, the average delay and LOS is reported both for the entire intersection as well as the minor-street movement with the greatest delay.

TABLE 1: SIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	Description (for Signalized Intersections)	Average Delay (seconds per vehicle)	
		Signalized Intersections	Unsignalized Intersections
A	Operations with very low delay occurring with favorable progression and/or short cycle length.	≤ 10.0	≤ 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	>10.0 to 20.0	> 10.0 to 15.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20.0 to 30.0	> 15.0 to 25.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35.0 to 55.0	> 25. 0 to 35.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55.0 to 80.0	>35.0 to 50.0
F	Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	> 80.0	> 50.0

Source: 2010 Highway Capacity Manual.

AVERAGE DAILY TRAFFIC (ADT)

Average Daily Traffic (ADT) is a valuable metric used to evaluate the traffic volume on a roadway compared to its capacity. ADT is the sum of all trips in each direction of a roadway segment over a 24-hour period. Comparison of "No Project" and "Plus Project" ADT can provide understanding of the overall impacts of a project on the roadway system. ADT is typically an estimate of mid-week traffic (Tuesday, Wednesday, or Thursday) while schools are in session.

Note that while the City of Roseville reports ADT on its roadways, the City does not use an ADT-based LOS metric. The City evaluates LOS at signalized intersections only because intersections dictate overall operations of the City's roadway system.

SIGNIFICANCE CRITERIA

The City of Roseville's Level of Service policy calls for maintaining a LOS C standard at a minimum of 70 percent of all signalized intersections in the City during the AM and PM peak hours. The City Council, following a public hearing, may determine, on a case-by-case basis that "extraordinary" improvements are not feasible or desirable and may relax the LOS C standard for a particular intersection.

The City's LOS policy is not applicable for unsignalized intersections. Average delay and LOS results are provided at those facilities for information purposes.

The project would have a significant impact if it would:

ROADWAY SYSTEM

1. Cause a signalized intersection in Roseville to be degraded as follows under Existing or Cumulative (2035) conditions during the AM or PM peak hours:
    - For intersections operating at LOS C or better: worsen operations to LOS D or worse.
    - For intersections that operate at less than LOS C: cause operations to further worsen by one or more service levels.
    - For intersections that operate at LOS F: cause intersection delay to worsen by 12.5 seconds or greater.
2. Cause the overall percentage of signalized intersections throughout the City of Roseville operating at LOS C or better during the AM and PM peak hours to fall below 70 percent.

Since the City Council approved the Amoruso Ranch Specific Plan in mid-2016 (along with a 2035 horizon year and changes in intersection analysis methods), the City's General Plan now reflects a revised list of intersections that would operate at LOS D or worse during the AM and PM peak hours. This list of intersections includes the Washington Boulevard/Pleasant Grove Boulevard intersection, which is predicted to operate at LOS D during the PM peak hour under Cumulative (2035) conditions. All other signalized study intersections were predicted to operate at LOS C or better.

BICYCLE SYSTEM

- Not meet the policies and guidelines of Roseville's Bicycle Master Plan.

PEDESTRIAN SYSTEM

- Interfere with the operation of an existing pedestrian facility or preclude the construction of a planned pedestrian facility.

TRANSIT SYSTEM

- Have a negative impact on transit operations, travel times, and/or circulation.

CONSTRUCTION-RELATED TRAFFIC IMPACTS

- Degrade an intersection to an unacceptable level of operations.
- Cause inconveniences to motorists due to prolonged street closures.
- Result in increased frequency of potential conflicts between vehicles, pedestrians, and bicyclists.

EMERGENCY VEHICLE ACCESS IMPACTS

- Result in inadequate emergency vehicle access.

2. EXISTING CONDITIONS

This chapter analyzes existing conditions within the study area including the roadway, bicycle, pedestrian, and transit systems.

ROADWAY SYSTEM

Within the study area, Washington Boulevard is primarily a two-lane arterial roadway with a posted speed limit of 45 mph. As noted previously, it has an 85th percentile vehicle speed of 51 mph based on a survey conducted by the City of Roseville in January 2014.

Washington Boulevard transitions from four to two travel lanes a short distance south of Pleasant Grove Boulevard. Similarly, it transitions from four to two travel lanes a short distance north of Sawtell Road/Derek Place. As the image below depicts, Washington Boulevard is a two-lane undivided roadway with limited shoulders at the UPRR Andora underpass. **Figure 2** shows the existing number of travel lanes along segments of Washington Boulevard and on other nearby roadways.

View of northbound Washington Boulevard at UPRR Andora Underpass

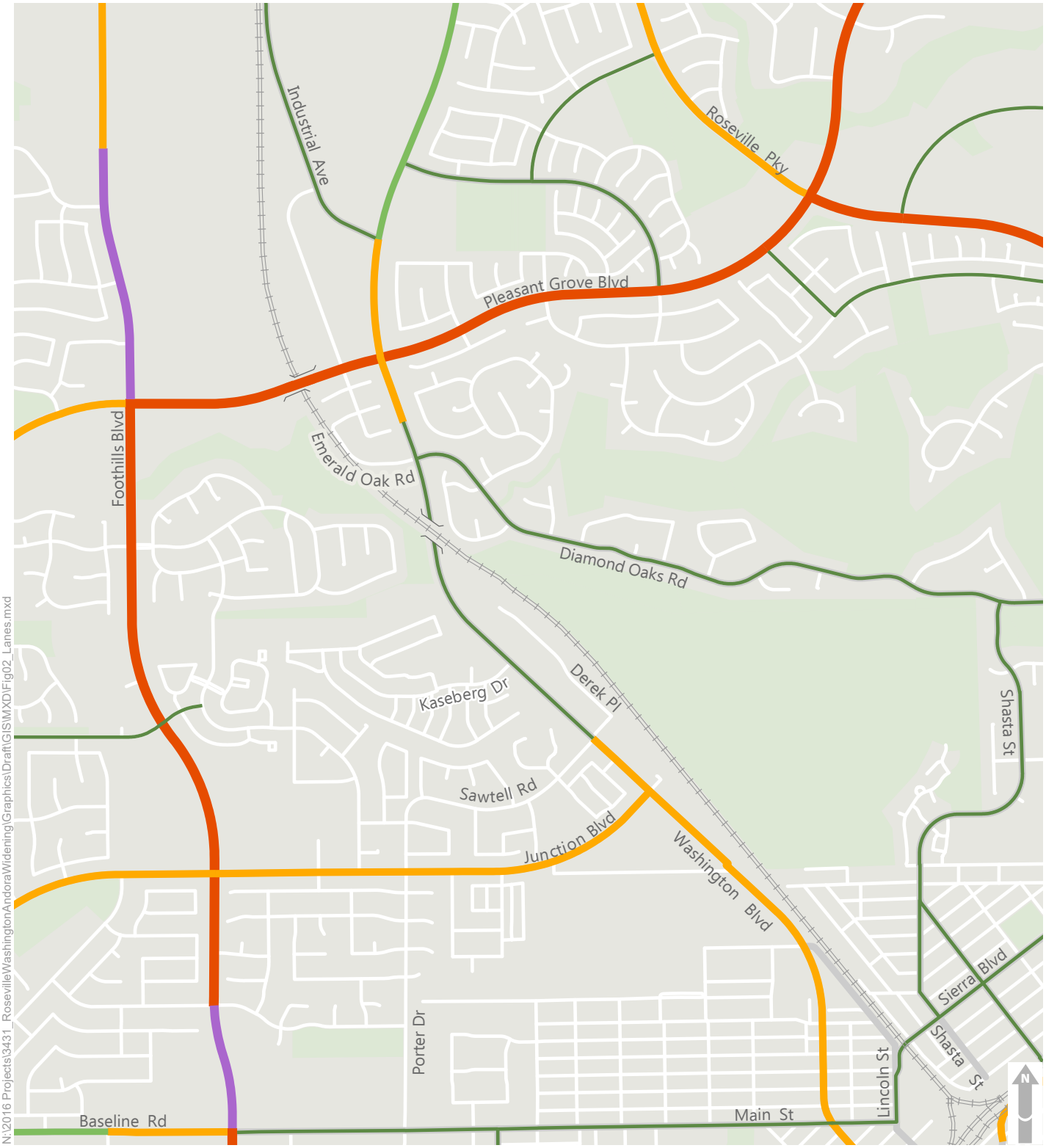


Figure 2

Number of Lanes

Figure 3 displays existing weekday AM and PM peak hour turning volumes and lane configurations at the study intersections. At most study intersections, the AM peak hour occurred from 7:30 – 8:30 AM, and the PM peak hour occurred from 4:45 to 5:45 PM.

The City of Roseville provided traffic count data at the four signalized study intersections for three different weekdays in April 2015 from their ITS traffic count database. Fehr & Peers conducted traffic counts at the unsignalized Washington Boulevard/Kaseberg Drive intersection in May 2016. The segment volumes (i.e., north and south of Kaseberg Drive) collected in May 2016 were compared to the averaged April 2015 counts. The comparison showed somewhat greater volumes during the May 2016 counts versus the April 2015 counts. This growth may be due to a variety of factors ranging from new land uses in the area, increased congestion on parallel facilities, and seasonal variations in traffic demand. The through movements at intersections #1, #2, #4, and #5 were increased from the observed April 2015 values as appropriate to reflect this traffic growth, thereby enabling these volumes to represent May 2016 conditions.

The ADT on Diamond Oaks Road and Washington Boulevard was collected and compared for conditions when nearby schools are both in session and out of session. **Table 2** shows the results for Diamond Oaks Road, while **Table 3** shows the results for Washington Boulevard. As shown, the ADT on Washington Boulevard increases by five percent, and the ADT on Diamond Oaks Road increases by 20 percent when school is in session.

TABLE 2: DIAMOND OAKS ROAD - EXISTING AVERAGE DAILY TRAFFIC

Segment	Count Date	Average Daily Traffic (ADT)
School Out of Session		
Diamond Oaks Road east of Washington Boulevard	Tuesday, August 2, 2016	4,400
	Wednesday, August 3, 2016	4,400
	Thursday, August 4, 2016	4,700
	Average	4,500
School In Session		
Diamond Oaks Road east of Washington Boulevard	Wednesday, August 17, 2016	5,100
	Thursday, August 18, 2016	5,600
	Average	5,400 (20% increase)

Notes:
1. Data collected on Tuesday, August 16th was not used because of malfunction of Washington Boulevard/Pleasant Grove Boulevard traffic signal, which caused atypical traffic patterns.
2. Source: City of Roseville ITS Traffic count database.
3. Values rounded to the nearest 100 vehicles.

Source: Fehr & Peers, 2016.

TABLE 3: WASHINGTON BOULEVARD - EXISTING AVERAGE DAILY TRAFFIC

Segment	Count Date	Average Daily Traffic (ADT)
School Out of Session		
Washington Boulevard south of Diamond Oaks Road	Tuesday, August 2, 2016	19,000
	Wednesday, August 3, 2016	19,200
	Thursday, August 4, 2016	19,800
	Average	19,300
School In Session		
Washington Boulevard south of Diamond Oaks Road	Wednesday, August 17, 2016	19,900
	Thursday, August 18, 2016	20,700
	Average	20,300 (5% increase)

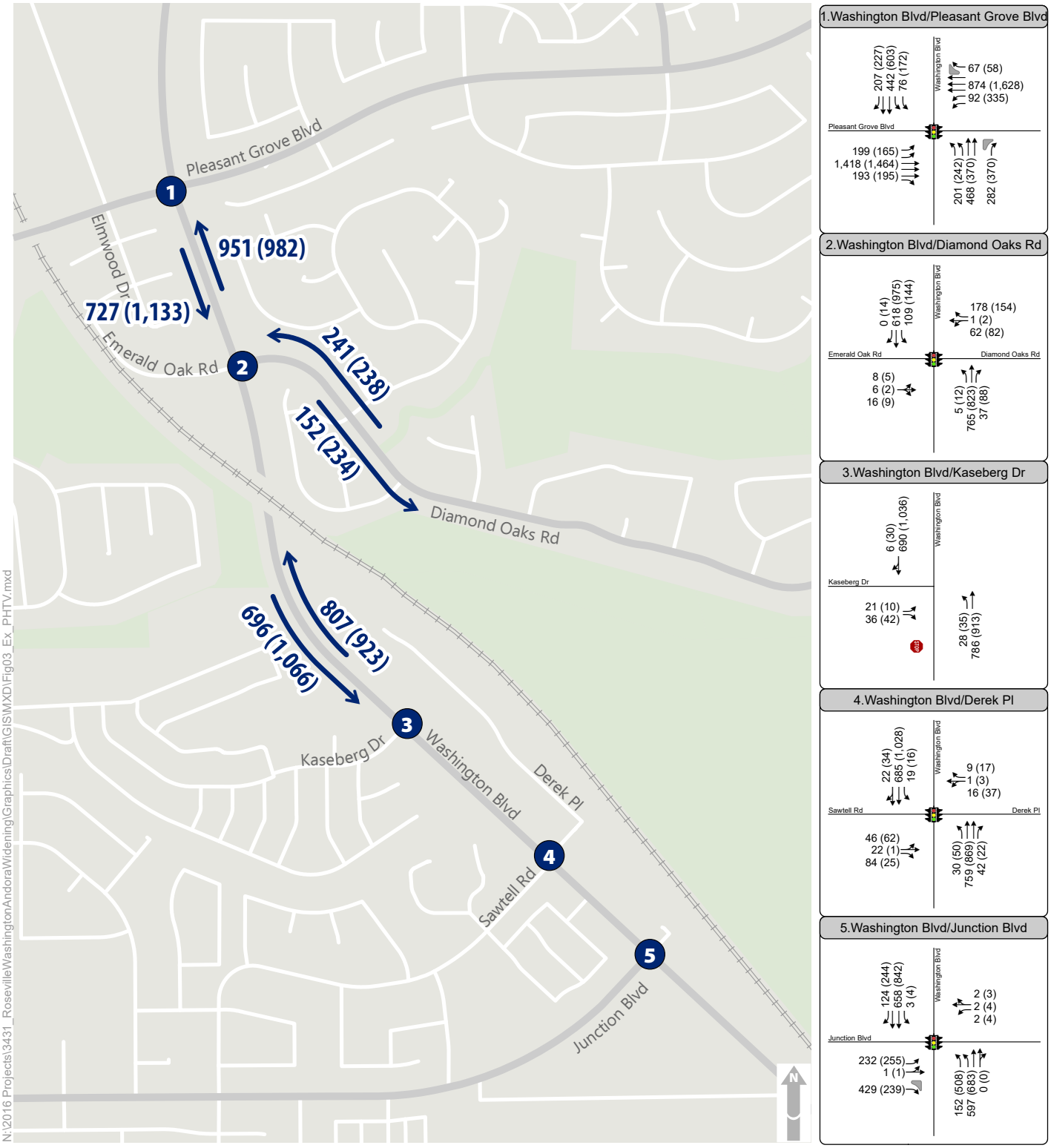
Notes:
1. Data collected on Tuesday, August 16th was not used because of malfunction of Washington Boulevard/Pleasant Grove Boulevard traffic signal, which caused atypical traffic patterns.
2. Source: City of Roseville ITS Traffic count database.
3. Values rounded to the nearest 100 vehicles.

Source: Fehr & Peers, 2016.

Figure 4 shows the existing ADT at multiple locations along Washington Boulevard, Pleasant Grove Boulevard, Diamond Oaks Road, and Junction Boulevard. The ADT estimates were obtained as follows:

- The ADT on Pleasant Grove Boulevard and Junction Boulevard were based on data provided by the City of Roseville in April 2015.
- The ADT estimate shown on Figure 4 on Washington Boulevard south of Diamond Oaks Road is based on the average value shown in Table 3 (while schools are in session). The ADT estimates on the other segments were derived by factoring the daily traffic volume based on how the AM and PM peak hour volume differ for each given segment.

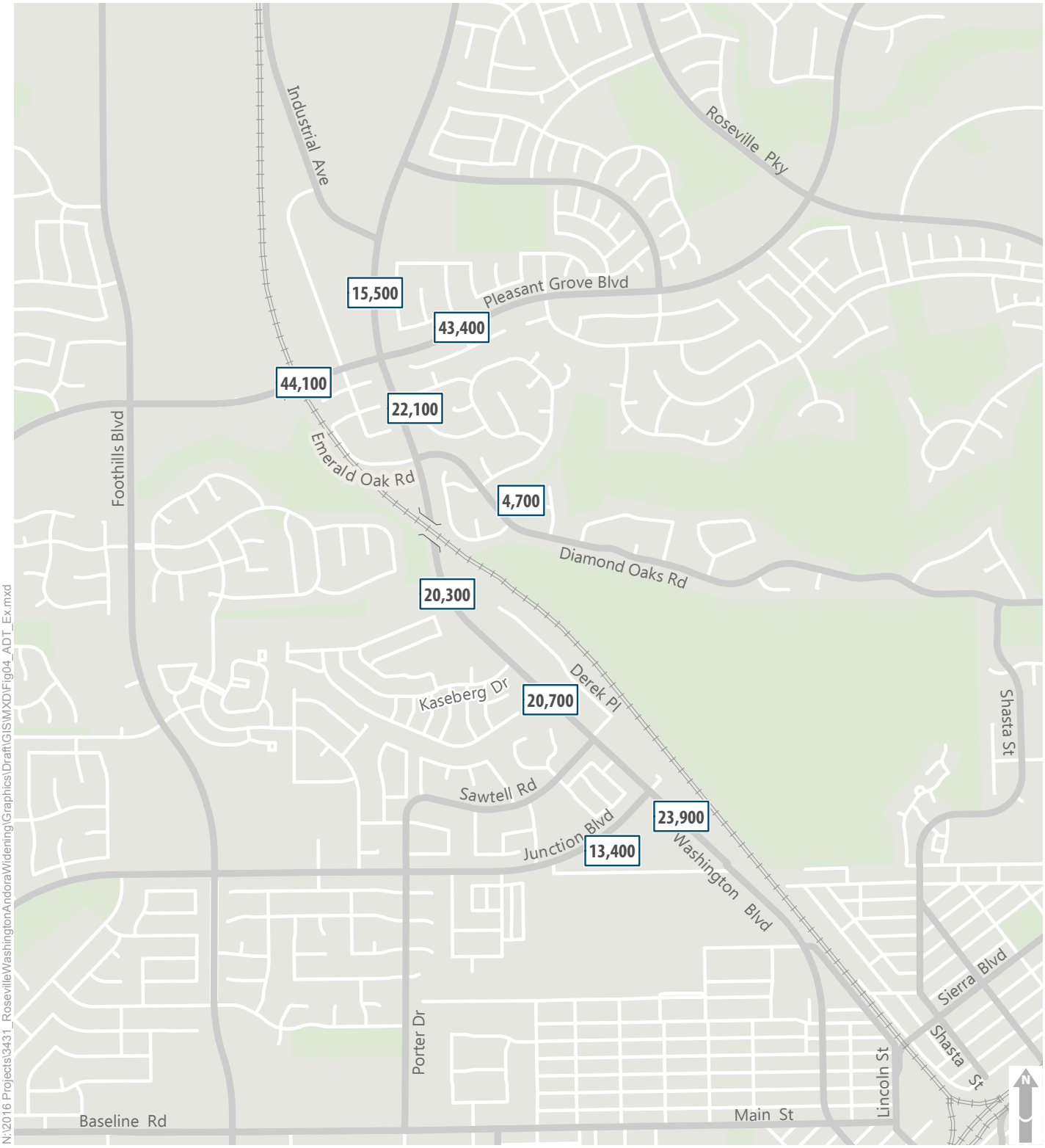
The ADT on Washington Boulevard (20,300 to 22,100 within the widening limits) represents a substantial amount of traffic for a two-lane undivided roadway to accommodate.



Note: The AM peak hour occurred from 7:30 – 8:30 AM, and the PM peak hour occurred from 4:45 to 5:45 PM.

Figure 3

Peak Hour Traffic Volumes and Lane Configurations - Existing Conditions



13,400 Average Daily Traffic (ADT)

Note:
Based on traffic counts collected in May 2016 while schools were in session.

Figure 4

Average Daily Traffic - Existing Conditions

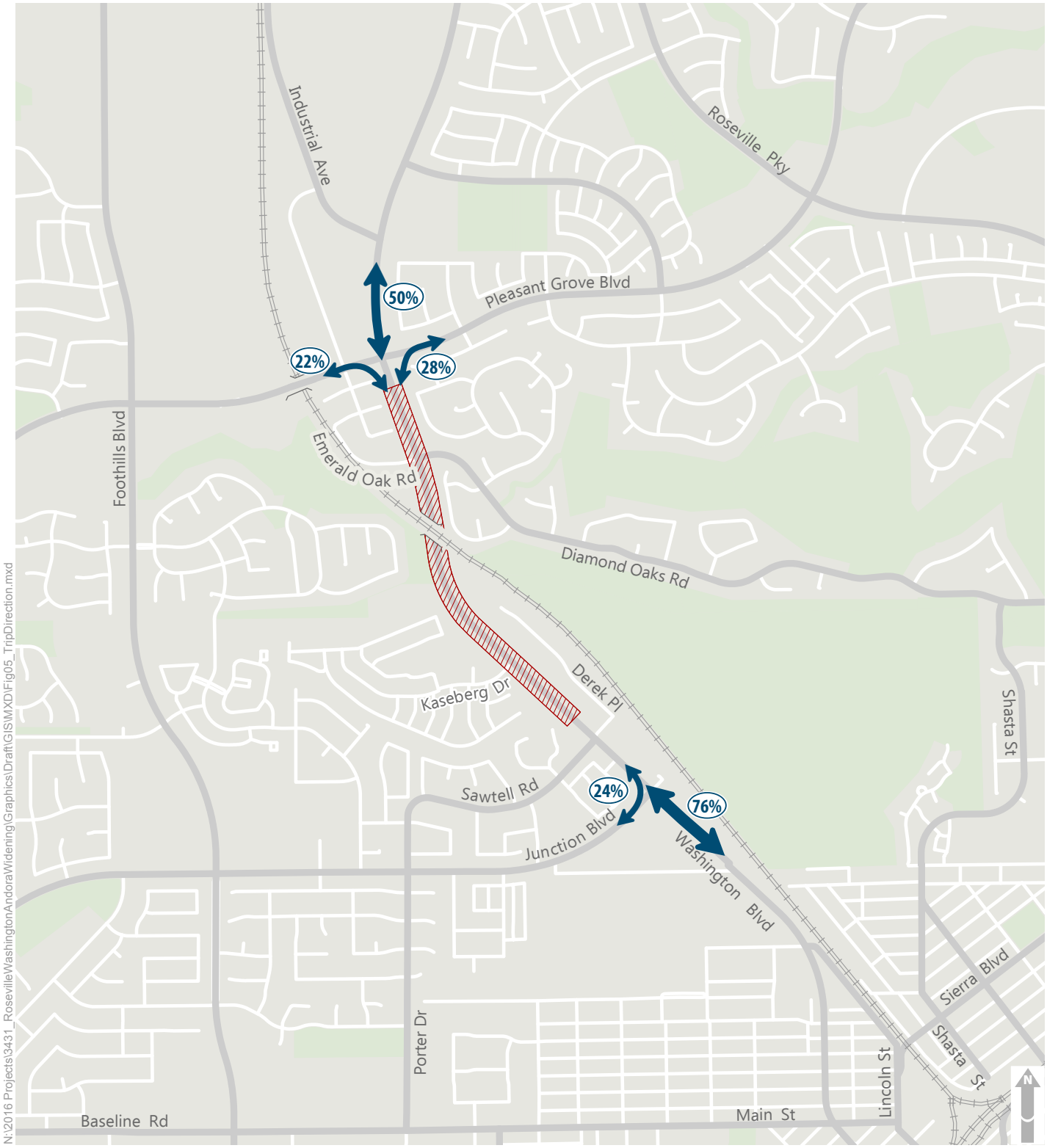
Figure 5 shows the general directionality of trips entering and exiting each end of the Washington Boulevard corridor, which reflect conditions with school in session. These estimates were derived by the AM and PM peak hour turning movements, and should be considered to provide a general trend of travel behavior. As shown, about three-quarters of the trips on the south end of the corridor are continued through trips on Washington Boulevard south of Junction Boulevard. In contrast, about half of the trips on the north end of the corridor either turn left or right from Pleasant Grove Boulevard.

Figure 6 displays a comparison of existing travel times on potential parallel/alternative routes to Washington Boulevard. This data was compiled primarily to assist in the evaluation of how various construction closure scenarios may affect a redistribution of existing traffic. Data is shown for the PM peak hour since this period has the greatest overall traffic volumes and amount of potentially diverted traffic. The travel time runs were conducted while schools were not in session because the majority of construction-related closures would occur during the summer when schools are not in session. This data is reported in this chapter because it pertains to existing conditions. However, its meaning and applicability to construction closures are discussed in detail in Chapter 5.

INTERSECTION OPERATIONS

The study corridor was analyzed using the SimTraffic microsimulation model. Refer to Chapter 1 for rationale for selection of this model. Actual signal timings at each signalized study intersection were entered into the model, as were lane configurations and peak hour traffic volumes. Although the private eastbound Kaseberg Drive approach to Washington Boulevard does not have two striped lanes, field observations indicated that the approximate 27-feet of pavement is sufficient to allow simultaneous left- and right-turn movements. Hence, they were modeled as exclusive left- and right-turn lanes.

It is important that the SimTraffic model be calibrated to match existing conditions. Thus, the model included the signal timing/coordination plans that exist along the Pleasant Grove Boulevard corridor (including the addition of nearby signalized intersections to model the effect of vehicle platooning). Additionally, it is important that the model properly replicate the somewhat random arrival of northbound Washington Boulevard traffic approaching Diamond Oaks Road. Field observations reveal that these arrivals can result in lengthy queues that extend back toward (but not typically into) the UPRR Andora Underpass structure. The SimTraffic model estimated the northbound through movement at Washington Boulevard/Diamond Oaks Road would have a PM peak hour 95th percentile vehicle



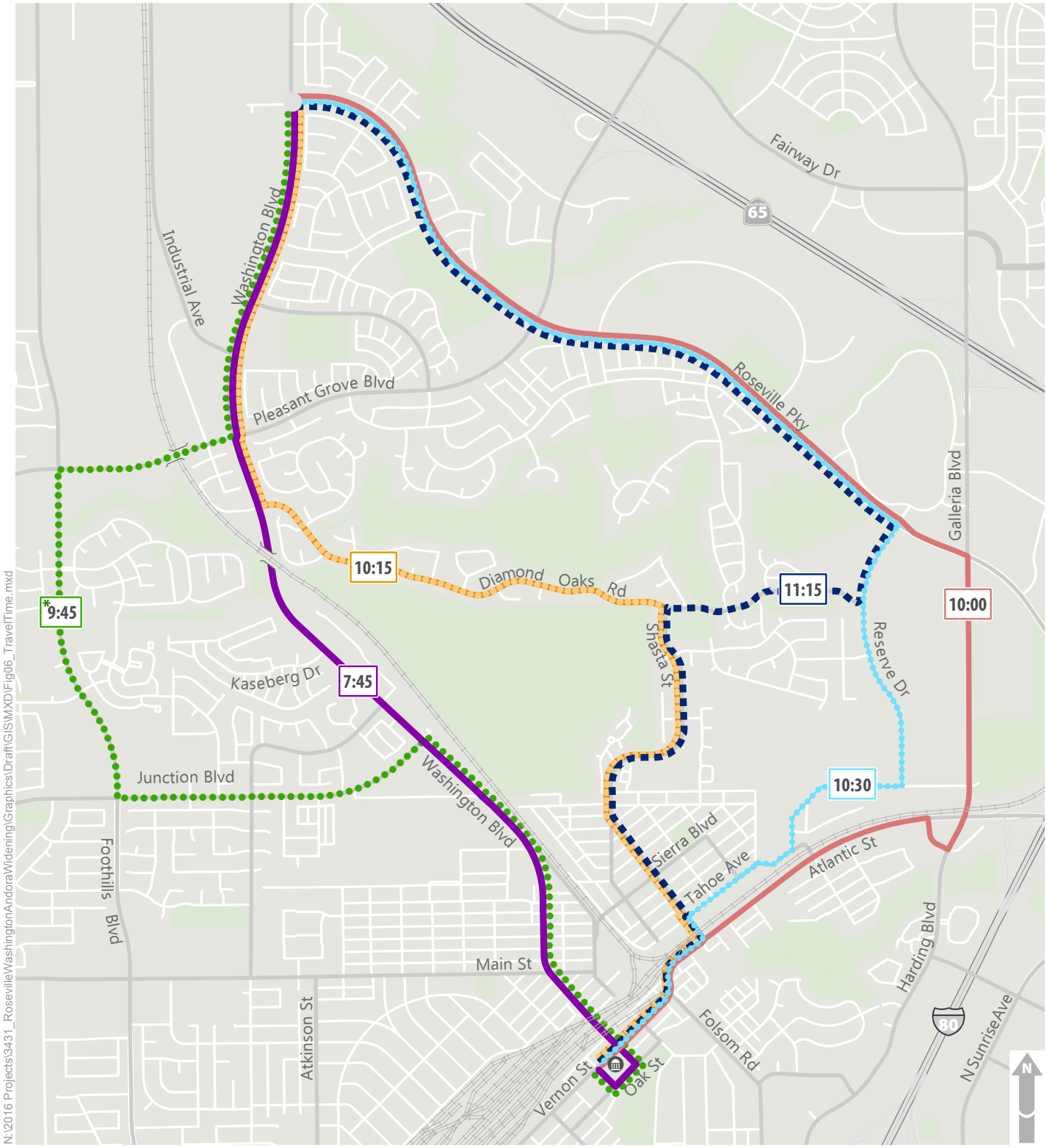
50% Percent of Trips

Study Corridor

Note:
Directionality estimated using AM and PM peak hour turning movements.

Figure 5

Existing Directionality of Trips Entering/Exiting Study Corridor



City Hall

XX:YY minutes:seconds

Notes:

1. Travel time survey conducted during PM peak hour while schools were not in session.
2. City Hall chosen as southerly destination, though travel time results would be comparable for other southerly origins/destinations.

*Travel time savings on this route increases as the southerly destination moves north (e.g., Old Roseville)

Figure 6

Travel Time Comparison - Existing Conditions

queue of 450 feet (i.e., 18 vehicles), which represents queuing that extends about two-thirds of the way back to the overcrossing. Reviews of other critical turn movements yielded similar validation findings. Thus, the model is adequately calibrated to existing conditions.

All signalized study intersections currently operate with protected left-turn phasing with the exception of the eastbound-westbound approaches to the Washington Boulevard/Diamond Oaks Road/Emerald Oak Road intersection, which operate with permitted phasing. The intersections along Washington Boulevard at Junction Boulevard and Sawtell Road are coordinated during peak periods. The Washington Boulevard/Diamond Oaks Road intersection is not coordinated.

Table 4 displays the average delay and LOS at the five study intersections (refer to Appendix A for technical calculations). These results represent conditions while schools are in session. As shown, all signalized study intersections operate at LOS C or better with the exception of the Washington Boulevard/Pleasant Grove Boulevard intersection, which operates at LOS D during the PM peak hour.

TABLE 4: PEAK HOUR INTERSECTION OPERATIONS – EXISTING CONDITIONS

	Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
1	Washington Boulevard / Pleasant Grove Boulevard	Signal	33	C	46	D
2	Washington Boulevard / Diamond Oaks Road / Emerald Oak Road	Signal	21	C	29	C
3	Washington Boulevard / Kaseberg Drive (private) [1]	Side-Street Stop	14 (11)	A (B)	5 (23)	A (C)
4	Washington Boulevard / Sawtell Road / Derek Place	Signal	10	A	11	B
5	Washington Boulevard / Junction Boulevard	Signal	10	A	16	B

[1] For side-street stop controlled intersections, the overall delay and worst movement delay is reported.
Source: Fehr & Peers, 2016.

BICYCLE / PEDESTRIAN SYSTEM

The following bicycle facilities are present along the Washington Boulevard corridor:

- Northbound: No designated bicycle facilities are present along Washington Boulevard. However, a two-way Class I multi-use path exists on the east side of Washington Boulevard extending from the Derek Place cul-de-sac northerly to Pleasant Grove Boulevard. This Class I facility includes a tunnel under the UPRR tracks.
- Southbound: A Class II on-street bike lane extends for a short segment south of Pleasant Grove Boulevard, terminating prior to Diamond Oaks Road. A sign is present in the southbound direction stating the following: "Bicycles Not Advised in Underpass". Southbound bicyclists can access the Class I path on the east side by either traveling with traffic and turning left at Diamond Oaks Road or remaining on the west side of the street and using the crosswalk to cross to the east side of the street.

No designated pedestrian facilities are present on the east side of Washington Boulevard north of Sawtell Road with the exception of the portion of the two-way Class I multi-use path located north of Diamond Oaks Road. A sidewalk is located on the west side of Washington Boulevard between Pleasant Grove Boulevard and Diamond Oaks Road. A sidewalk also exists from south of Kaseberg Drive to Sawtell Road. Crosswalks are present on all approaches at the Washington Boulevard/Pleasant Grove Boulevard and Washington Boulevard/Sawtell Road signalized intersections. Crosswalks are present on the east, west, and north legs of the Washington Boulevard/Diamond Oaks Road signalized intersection. Crosswalks are not present at the Washington Boulevard/Kaseberg Drive intersection.

In summary, bicycle and pedestrian facilities are present on portions of the study segment of Washington Boulevard. However, they are not continuous and therefore not well-suited for extended bicycle and pedestrian travel.

TRANSIT SYSTEM

No transit routes currently run on Washington Boulevard within the study area. However, Roseville Transit operates local lines along segments of Washington Boulevard adjacent to the study area (e.g. north of Pleasant Grove Boulevard and south of Junction Boulevard). A bus turnout is constructed on the west side of Washington Boulevard south of Pleasant Grove Boulevard.

3. EXISTING PLUS PROJECT CONDITIONS

This chapter analyzes the impacts of the proposed project under existing conditions. Refer to Appendix B for the 30 percent drawings of the proposed widening prepared by Mark Thomas & Company (dated September 9, 2016).

TRAFFIC FORECASTS

The City of Roseville base year travel demand model (TDM) was used to forecast expected changes in daily traffic and peak hour turning movement volumes under an "Existing Plus Washington / Andora Widening" condition (i.e., "Existing Plus Project"). The model underwent a review of roadway lanes, free-flow speeds, traffic analysis zone (TAZ) loadings, and other factors to ensure that it was adequately calibrated within the study area so that its traffic projections matched existing volumes (to within tolerable levels of deviation).

The proposed widening of Washington Boulevard was added to the base year model. The difference in the traffic volume estimates predicted by the model was then added to existing counts. This process is known as the difference method and is displayed below:

> *Existing Plus Project Forecast = Existing Volume + (Base Model Plus Project – Base Model)*

Figure 7 shows the AM and PM peak hour turning volumes at these intersections for the Existing Plus Project scenario. During each peak hour, the volumes traveling in either direction of Washington Boulevard south of Pleasant Grove Boulevard would increase by 220 to 400 vehicles depending on the peak hour and direction.

Figure 8 presents the Existing Plus Project ADT forecasts, and **Table 5** compares them to the Existing Conditions. As shown, the widening of Washington Boulevard would result in an increase of 7,700 vehicles per day on the widened portion of the roadway. A considerable amount of this traffic (6,000 daily vehicles) would be redistributed from Foothills Boulevard, a parallel six-lane roadway.

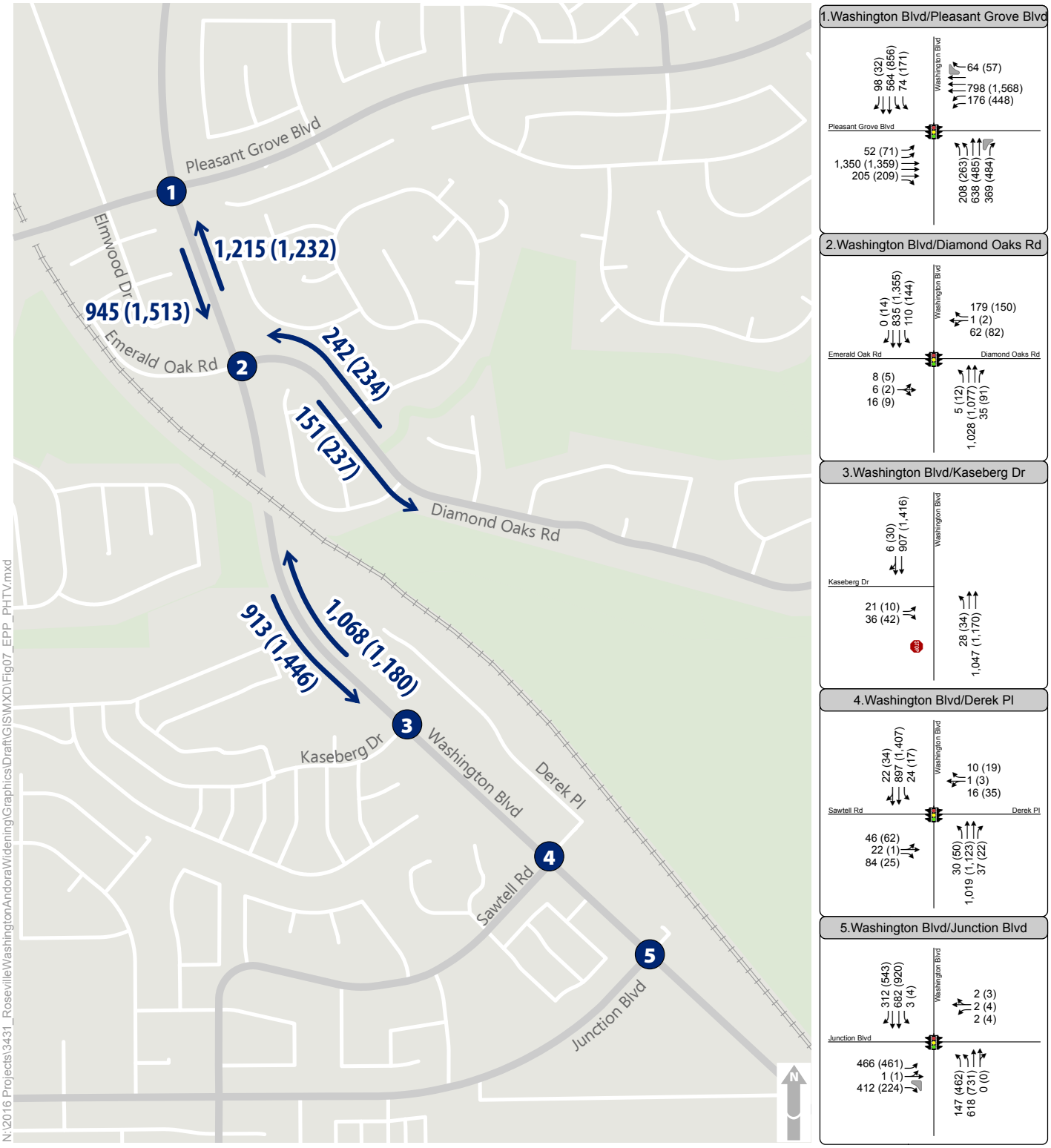


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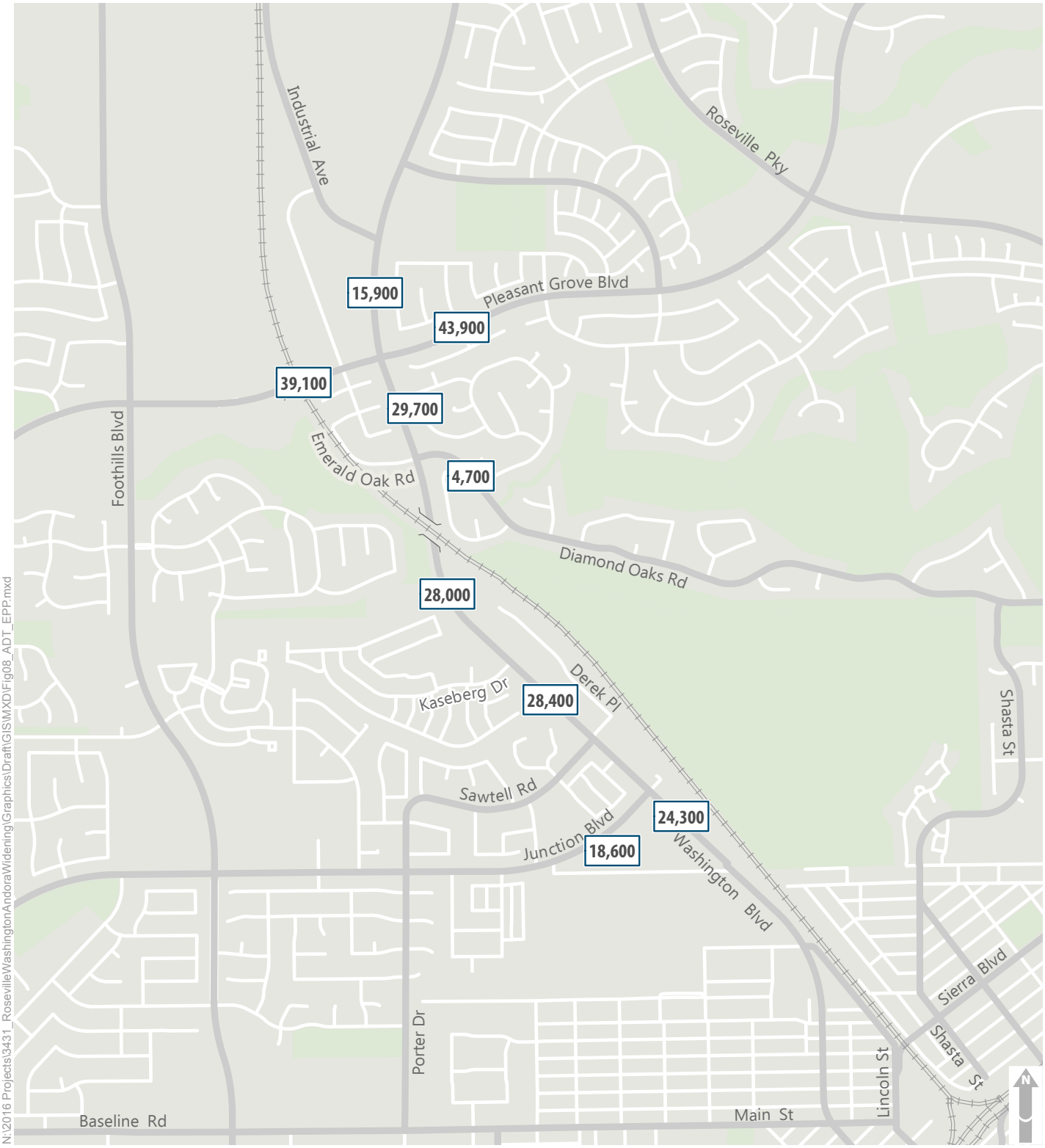
Figure 7

Peak Hour Traffic Volumes and Lane Configurations - Existing Plus Project Conditions



13,400 Average Daily Traffic (ADT)

Figure 8

Average Daily Traffic - Existing Plus Project Conditions

TABLE 5: EXISTING PLUS PROJECT AVERAGE DAILY TRAFFIC

Location	Existing ADT	Existing Plus Project ADT	Difference
Washington Boulevard between Pleasant Grove Boulevard and Industrial Avenue	15,500	15,900	+400
Washington Boulevard between Emerald Oak Road / Diamond Oaks Road and Pleasant Grove Boulevard	22,100	29,700	+7,600
Washington Blvd between Kaseberg Drive and Emerald Oak Road / Diamond Oaks Road	20,300	28,000	+7,700
Washington Blvd between Kaseberg Drive and Sawtell Road / Derek Place	20,700	28,400	+7,700
Washington Blvd between Junction Boulevard and Corporation Yard Road	23,900	24,300	+400
Pleasant Grove Boulevard between Winslow Drive and Washington Boulevard	43,400	43,900	+500
Pleasant Grove Boulevard between Washington Boulevard and Galilee Road/ Elmwood Rive	44,100	39,100	-5,000
Diamond Oaks Road between Glenwood Circle / Firestone Drive and Washington Boulevard	4,700	4,700	0
Junction Boulevard between Washington Boulevard and Corporation Yard Road	13,400	18,600	+5,200
Foothills Boulevard between Pleasant Grove Boulevard and S Bluff Drive / Beckett Drive	32,200	26,000	-6,000

Note: Values rounded to the nearest one hundred vehicles.

Source: Fehr & Peers, 2016

INTERSECTION OPERATIONS

The following describes the anticipated lane configurations, traffic control, and signal timing at each study intersection:

- Washington Boulevard/Diamond Oaks Road – Northbound and southbound approaches would each consist of one left-turn, two through lanes, and a dedicated right-turn lane. Eastbound and westbound approaches would remain unchanged and continue to operate with permitted phasing, per direction from City Traffic Operations staff.

- Washington Boulevard/Kaseberg Drive (private driveway) – would feature the same lane configurations with the exception of a second northbound and southbound through lane. The median would be configured to continue to provide an acceleration lane onto northbound Washington Boulevard.

- Washington Boulevard/Pleasant Grove Boulevard, Washington Boulevard/Sawtell Road, and Washington Boulevard/Junction Boulevard – no changes in lane configurations, traffic controls or signal timing/phasing from existing conditions.

Table 6 displays the average delay and LOS under Existing Plus Project conditions. Technical calculations for this analysis are in Appendix B. The following summarizes the key findings from the analysis:

- The widening of Washington Boulevard would degrade PM peak hour operations at the Washington Boulevard/Pleasant Grove intersection from LOS D to E. This occurs as a result of the southbound through movement increasing from 603 to 856 vehicles (42 percent), and the westbound-left volume increasing from 335 to 448 vehicles (34 percent), without any assumed changes in signal timings to accommodate these movements.

- Delays would decrease at the Washington Boulevard/Diamond Oaks Road intersection by virtue of additional capacity provided by the widening.

- Delays would increase modestly at the Washington Boulevard/Sawtell Road, Washington Boulevard/Junction Boulevard, and Washington Boulevard/Kaseberg Drive (private) intersections, though operations would remain at LOS C or better.

TABLE 6: PEAK HOUR INTERSECTION OPERATIONS – EXISTING PLUS PROJECT CONDITIONS

		Existing				Existing Plus Project			
	Intersection	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
1	Washington Boulevard / Pleasant Grove Boulevard	33	C	46	D	34	C	71	E
2	Washington Boulevard / Diamond Oaks Road / Emerald Oak Road	21	C	29	C	14	B	16	B
3	Washington Boulevard / Kaseberg Drive (private)[1]	14 (11)	A (B)	5 (23)	A (C)	4 (15)	A (C)	6 (22)	A (C)
4	Washington Boulevard / Sawtell Road / Derek Place	10	A	11	B	9	A	11	B
5	Washington Boulevard / Junction Boulevard	10	A	16	B	13	B	22	C

Notes:

[1] For side-street stop controlled intersections, the overall delay and worst movement delay is reported.
Source: Fehr & Peers, 2016

BICYCLE / PEDESTRIAN SYSTEM

The proposed project would substantially improve the environment for bicycle and pedestrian travel, as follows:

- The project would result in continuous Class II bike lanes on both sides of Washington Boulevard between Sawtell Road and Pleasant Grove Boulevard.
- A new sidewalk and a new segment of Class 1 Multi-Use Trail would be constructed on the west side of Washington Boulevard between Kaseberg Drive, the Power line corridor and Diamond Oaks Road, thereby resulting in a continuous pedestrian facility between Sawtell Road and Pleasant Grove Boulevard.
- The project would expand an existing Class I (i.e., off-street) Multi-Use Path located on the east side of the roadway. After construction, it would extend parallel to Washington Boulevard from Sawtell Road to Pleasant Grove Boulevard, providing a direct connection to the existing Class I path that connects to Derek Place.

Refer to Chapter 6 for project-specific impacts and mitigation measures.

4. CUMULATIVE (2035) CONDITIONS

This chapter presents the analysis of project impacts under Cumulative (2035) conditions.

LAND USE AND ROADWAY NETWORK ASSUMPTIONS

The City of Roseville utilizes a 2035 Capital Improvements Program (CIP) travel demand model to analyze future roadway conditions in the City. The model assumes buildout of the City of Roseville including various approved specific plans such as the Sierra Vista, Creekview, and Amoruso Specific Plans.[1] Land uses outside of the City represent projected absorption by the Year 2035. The City's traffic model also includes its existing roadway system along with planned CIP roadway and intersection improvements. The City's CIP project list is reasonably foreseeable based on a strong likelihood (and past history) that they will very likely be fully funded by the time they are needed based on the current fees being collected.

The City's CIP includes the widening of Washington Boulevard to four lanes between Pleasant Grove Boulevard and Sawtell Road. Accordingly, recent environmental documents in the City have assumed this improvement in place under cumulative conditions. The City's CIP also assumes the addition of a fourth westbound travel lane at the Washington Boulevard/Pleasant Grove Boulevard intersection, which is assumed in place for this analysis.

[1] The selection of the 2035 CIP versus 2035 Cumulative travel demand models would not appreciably change the study findings, as the cumulative daily forecasts on Washington Boulevard are within 1.5 percent of each other.

TRAFFIC FORECASTS

Traffic forecasts were developed for the following two cumulative scenarios:

- Cumulative No Project – assumes Washington Boulevard remains two lanes between Pleasant Grove Boulevard and Sawtell Road.
- Cumulative Plus Project – assumes Washington Boulevard is widened to four lanes between Pleasant Grove Boulevard and Sawtell Road.

Cumulative traffic forecasts were developed using the 'difference method' procedure as described below:

> *Cumulative Forecast = Existing Volume + (Cumulative Traffic Model – Base Traffic Model)*

Figure 9 shows the Cumulative (2035) No Project AM and PM peak hour turning movement forecasts and lane configurations at the study intersections. **Figure 10** displays the average daily traffic on Washington Boulevard and adjacent roadways for Cumulative No Project conditions.

Figure 11 shows the Cumulative (2035) Plus Project AM and PM peak hour turning movement forecasts and lane configurations at the study intersections. **Figure 12** displays the average daily traffic on Washington Boulevard and adjacent roadways for Cumulative Plus Project conditions.

Table 7 compares the Cumulative (2035) ADT forecasts along Washington Boulevard and adjacent roadways under No Project and Plus Project conditions. Key findings from this table include the following:

- The ADT on Washington Boulevard south of Diamond Oaks Road would increase from 20,300 under existing conditions to 24,900 under Cumulative No Project Conditions, which is a 23 percent increase.
- The proposed widening of Washington Boulevard would result in 32,000 ADT on Washington Boulevard south of Diamond Oaks Road under cumulative conditions. While this is a sizeable volume of traffic for a four-lane arterial, it represents a 21 percent decrease in traffic on a 'per lane' basis when compared to existing conditions (i.e., 20,300 ADT on two lanes).

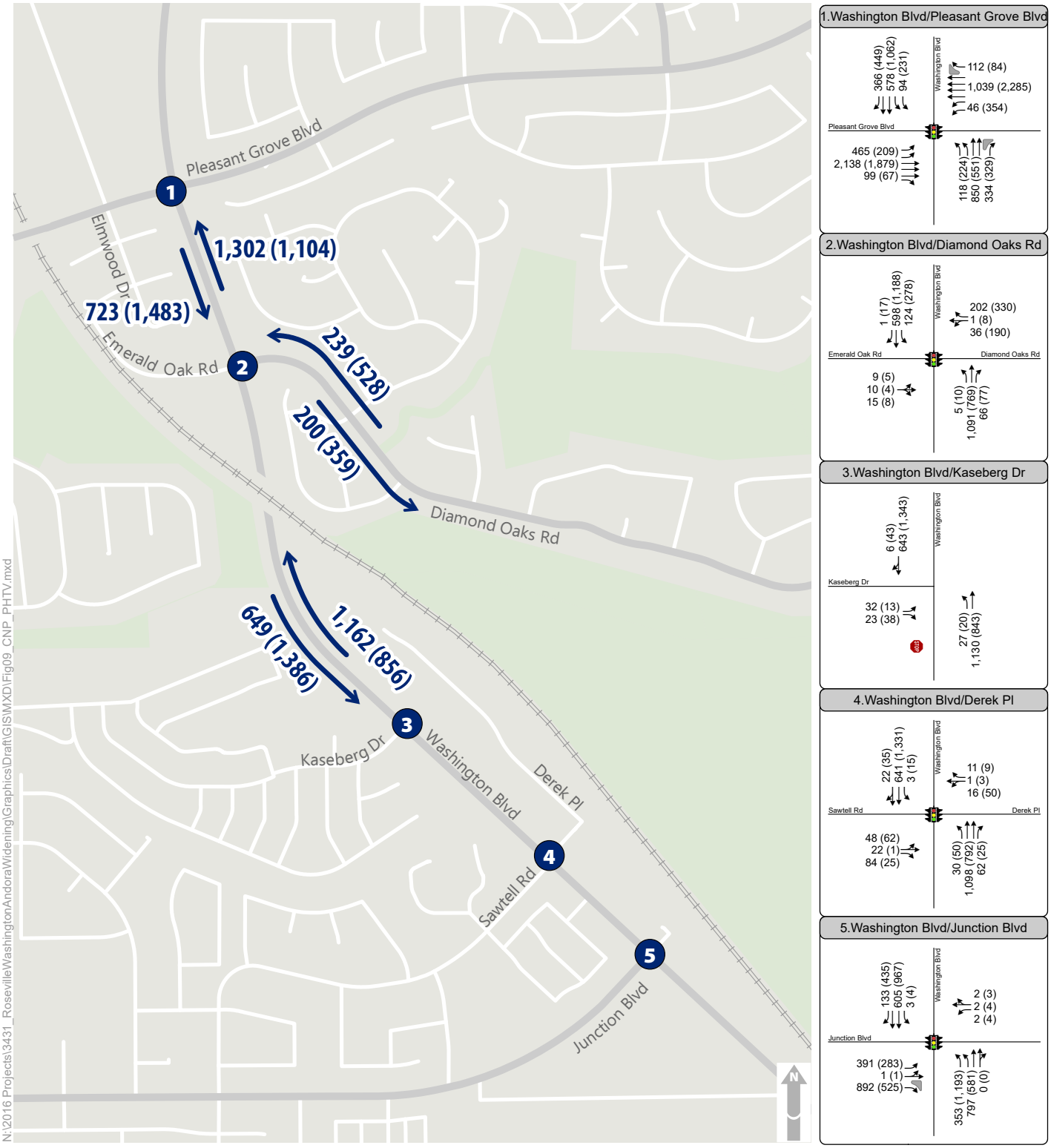


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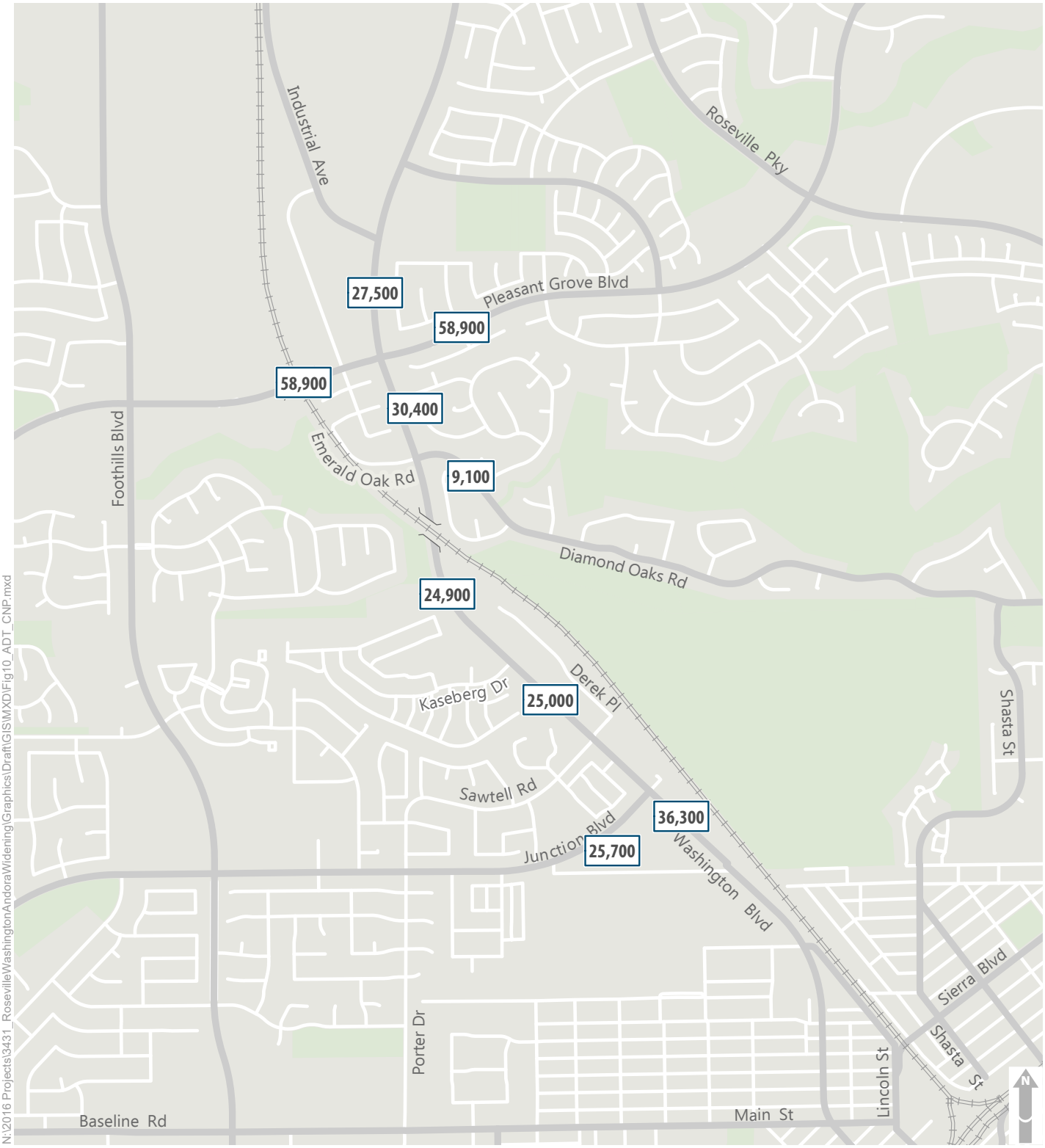
Figure 9

Peak Hour Traffic Volumes and Lane Configurations - Cumulative (2035) No Project Conditions



13,400 Average Daily Traffic (ADT)

Figure 10

Average Daily Traffic - Cumulative (2035) No Project Conditions

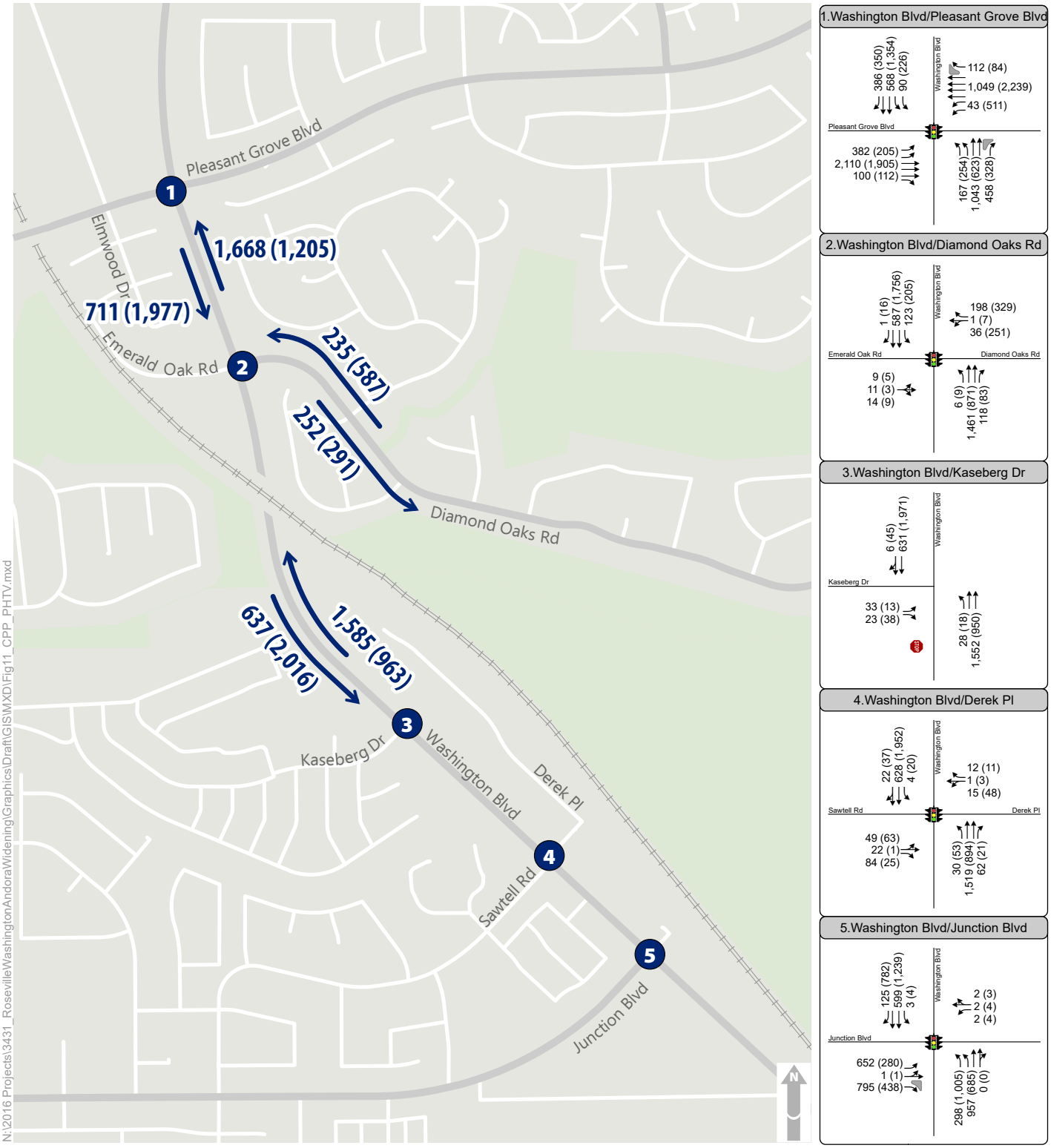


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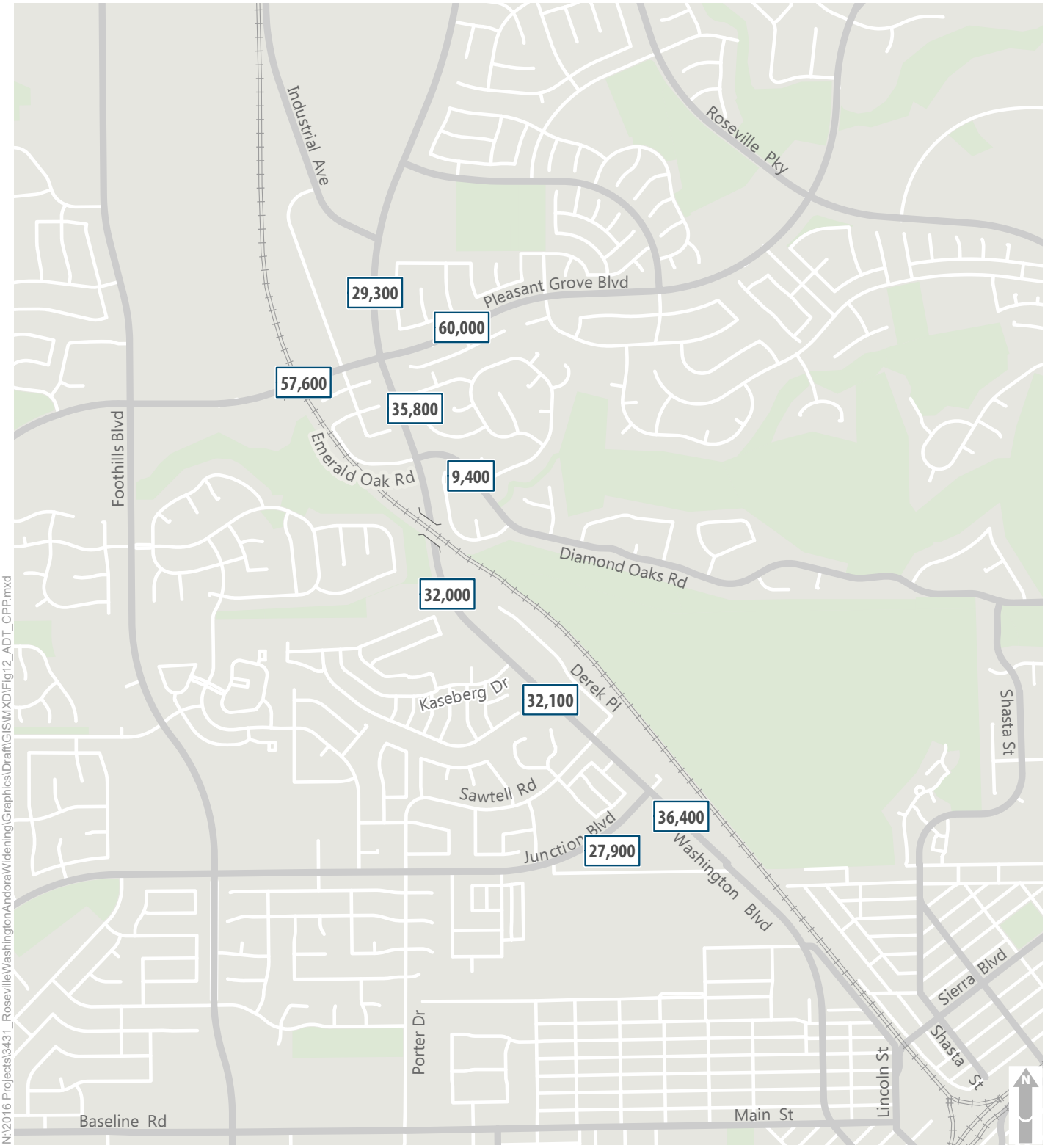
Figure 11

Peak Hour Traffic Volumes and Lane Configurations - Cumulative (2035) Plus Project Conditions



13,400 Average Daily Traffic (ADT)

Figure 12

Average Daily Traffic - Cumulative (2035) Plus Project Conditions

There is less traffic diversion from Foothills Boulevard to Washington Boulevard under Cumulative (2035) Plus Project Conditions versus Existing Plus Project conditions. Review of model output shows diversion on a slightly more regional scale including from more remote parallel roadways, such as Woodcreek Oaks Boulevard and Roseville Parkway.

TABLE 7: CUMULATIVE (2035) AVERAGE DAILY TRAFFIC

Location	Cumulative (2035) No Project ADT	Cumulative (2035) Plus Project ADT	Difference
Washington Boulevard between Pleasant Grove Boulevard and Industrial Avenue	27,500	29,300	+1,800
Washington Blvd between Kaseberg Drive and Emerald Oak Road / Diamond Oaks Road	30,400	35,800	+5,400
Washington Blvd between Kaseberg Drive and Emerald Oak Road / Diamond Oaks Road	24,900	32,000	+7,100
Washington Blvd between Kaseberg Drive and Sawtell Road / Derek Place	25,000	32,100	+7,100
Washington Blvd between Junction Boulevard and Corporation Yard Road	36,300	36,400	+100
Pleasant Grove Boulevard between Winslow Drive and Washington Boulevard	58,900	60,000	+1,100
Pleasant Grove Boulevard between Washington Boulevard and Galilee Road/ Elmwood Rive	58,900	57,600	-1,300
Diamond Oaks Road between Glenwood Circle / Firestone Drive and Washington Boulevard	9,100	9,400	+300
Junction Boulevard between Washington Boulevard and Corporation Yard Road	25,700	27,900	+2,200
Foothills Boulevard between Pleasant Grove Boulevard and S Bluff Drive / Beckett Drive	50,000	49,400	-600

Note: Values rounded to the nearest one hundred vehicles.

Source: Fehr & Peers, 2016.

INTERSECTION OPERATIONS

Traffic operations at the study intersections were analyzed for Cumulative No Project and Cumulative Plus Project AM and PM peak hour conditions using the SimTraffic model. **Table 8** displays these results. Refer to Appendix C for technical calculations.

TABLE 8: INTERSECTION OPERATIONS – CUMULATIVE (2035) CONDITIONS

		Cumulative (2035) No Project				Cumulative (2035) Plus Project			
Intersection		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
1	Washington Boulevard / Pleasant Grove Boulevard	41	D	110	F	52	D	165	F
2	Washington Boulevard / Diamond Oaks Road / Emerald Oak Road	68	E	36	D	22	C	22	C
3	Washington Boulevard / Kaseberg Drive (private)[1]	8 (13)	A (B)	9 (37)	A (E)	4 (11)	A (B)	7 (35)	A (E)
4	Washington Boulevard / Sawtell Road / Derek Place	9	A	10	A	12	B	16	B
5	Washington Boulevard / Junction Boulevard	15	B	41	D	20	B	42	D

Notes:

[1] For side-street stop controlled intersections, the overall delay and worst movement delay is reported.
Source: Fehr & Peers, 2016

The following summarizes the key findings from this table:

- Washington Boulevard/Pleasant Grove Boulevard – The widening of Washington Boulevard would exacerbate (i.e., add delay) LOS D conditions during the AM peak hour and LOS F conditions during the PM peak hour.
- Washington Boulevard/ Diamond Oaks Road – The widening of Washington Boulevard would improve AM peak hour operations from LOS E to C and improve PM peak hour operations from LOS D to C.
- Washington Boulevard/Kaseberg Drive (private driveway) – Delays would decrease slightly by virtue of additional gaps in traffic provided by the widening.
- Washington Boulevard/Sawtell Road – Delays would increase modestly, though operations would remain at LOS C or better.

- Washington Boulevard/Junction Boulevard – Delays would increase during the AM peak hour due primarily to the increase in the critical eastbound left-turn movement. However, operations would remain at LOS C. Operations would remain at LOS D during the PM peak hour.

The Washington Boulevard/Pleasant Grove Boulevard intersection was reported to operate at a cumulative LOS C during the AM peak hour and LOS D during the PM peak hour in the *Final Traffic Study for the Amoruso Ranch Specific Plan* (Fehr & Peers, 2016). This result was based on Synchro analysis methods, and the assumption of a third southbound through lane being in place. The Washington Boulevard/Junction Boulevard intersection was reported to operate at a cumulative LOS C during the PM peak hour in the *Final Traffic Study for the Amoruso Ranch Specific Plan* (Fehr & Peers, 2016). The increase in delay is due, in part, to the use of SimTraffic in this study versus Synchro (non-simulation) in the previous study. As noted previously, SimTraffic considers the effects of vehicular queuing spillbacks on adjacent movement operations, while Synchro does not. Additionally, minor changes in turn movement forecasts occurred at each intersection.

Refer to Chapter 6 for cumulatively considerable project impacts and mitigation measures.

BICYCLE SYSTEM

Below is an image of the recommended bikeway network in the study area according to the City of Roseville Bikeway Master Plan (2008). As shown, future Class I bike paths (shown as dashed green lines) are recommended to extend westerly from Washington Boulevard.

Source: City of Roseville Bikeway Master Plan

5. CONSTRUCTION-RELATED TRAFFIC IMPACTS

During construction, the segment of Washington Boulevard near the UPRR Andora underpass would likely need to be closed in some capacity. This chapter presents several potential construction closure scenarios as well as the operational results associated with two of those plans. The closure of Washington Boulevard for construction would likely occur during the months of June through September.

POTENTIAL CONSTRUCTION CLOSURE SCENARIOS

Fehr & Peers, Mark Thomas & Company, and City of Roseville staff brainstormed and evaluated multiple potential closure options of Washington Boulevard to enable reconstruction of the rail bridge.

- Construction Closure Option 1: Washington Boulevard would be closed to all vehicular traffic directly north of Kaseberg Drive to Pleasant Grove Boulevard. This would close Washington Boulevard access to Diamond Oaks Road and Emerald Oak Road for motorists.
- Construction Closure Option 2: Washington Boulevard would be closed to all vehicular traffic directly north of Kaseberg Drive to Diamond Oaks Road, and closed to only southbound vehicular traffic between Diamond Oaks Road and Pleasant Grove Boulevard. This means that vehicles traveling westbound on Diamond Oaks Road and eastbound on Emerald Oak Road may use Washington Boulevard only to travel northbound towards Pleasant Grove Boulevard.
- Construction Closure Option 3: Washington Boulevard would be closed to all vehicular traffic from directly north of Kaseberg Drive to directly south of Diamond Oaks Road. Motorists traveling southbound from Pleasant Grove Boulevard would continue to be able to access Diamond Oaks Road from Washington Boulevard and vice versa.
- Construction Closure Option 4: Washington Boulevard would be reduced to a single-lane from south of Diamond Oaks Road to beyond the railroad bridge for a distance of 1,400 feet, yet still allow northbound and southbound traffic by alternating one-way movements through the constricted section (most likely via a traffic signal).

At the request of the City of Roseville, an operational analysis of Construction Closure Options 3 and 4 was conducted and is presented in the following section.

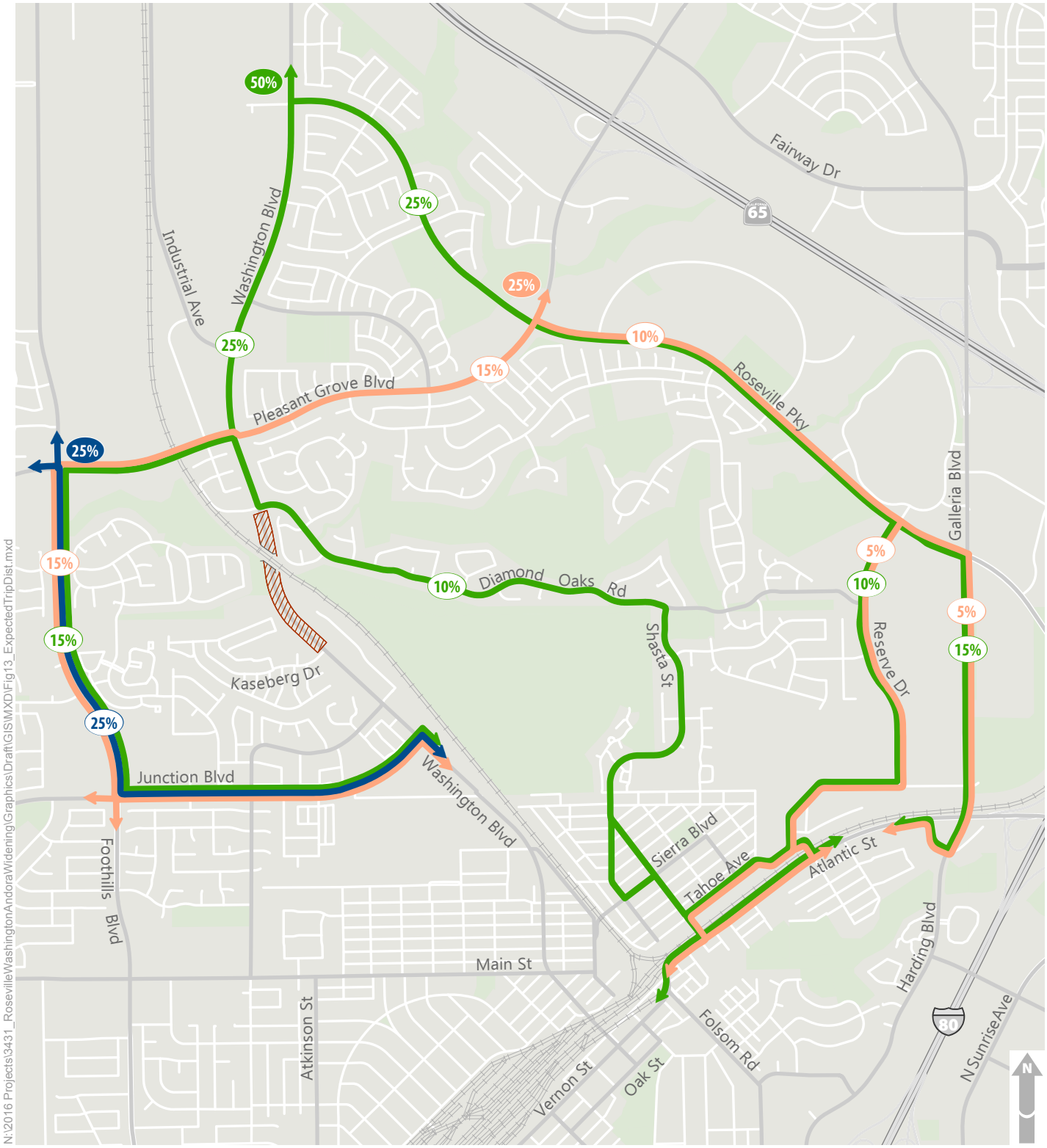
TRAFFIC EFFECTS OF CONSTRUCTION CLOSURE OPTION 3

The following two methods were used to evaluate the potential redistribution of traffic associated with this closure option:

- *Method A – Base Year City of Roseville Travel Demand Model*. The model was rerun with the closure plan in place and changes in average daily traffic were noted. Since the closure would be temporary, only the assignment module of the model was rerun (i.e., trip origins and destinations remained fixed). Refer to the Appendix D for a traffic model plot that shows the projected increase or decrease in ADT due to the street closure.
- *Method B – projected redistribution based on actual amount of traffic to be diverted and travel time survey results*. This method reassigns trips based on the spatial origins and destinations of trips using Washington Boulevard, and comparisons of which alternative routes offer the shortest travel times. **Figure 13** shows the expected redistribution of trips currently using Washington Boulevard.

Appendix D contains a spreadsheet that compares the projected change in ADT between the two methods. Overall, both methods yield comparable sets of projections, though there are some minor differences. Key conclusions from this evaluation include:

- The parallel segment of Foothills Boulevard would experience the greatest increase in traffic, with traffic levels increasing from about 32,000 to 43,000 ADT.
- Diamond Oaks Road east of Washington Boulevard would experience a net increase of about 2,000 ADT under conditions when schools are not in session. This would cause the segment's ADT to increase from 4,500 to 6,500 ADT. Under conditions when schools are in session, the ADT would be expected to increase from 5,400 to 8,000 ADT.



Redistribution of Trips
- to/from the north & south (50%)
- to/from the west & south (25%)
- to/from the east & south (25%)

XX% Percentage at North, West or East gateway

XX% Percentage on a given segment

Closed section of Washington Blvd.

Notes:
1. Routes shown are primarily for through trips and are based on conditions when nearby school are not in session.
2. Routing does not consider the extent to which additional congestion on a given route could cause further redistribution

Figure 13

Expected Redistribution of Existing Traffic Under Closure Option 3

These estimates are considered approximate and could change for a variety of reasons, as described below:

- An effective public information campaign and traffic detour strategy could encourage some streets to be used to a greater degree than others.
- The additional travel time associated with the detours could change trip destinations or suppress trip-making.
- Traffic volume increases on detoured routes could cause additional delays, which could result in redistribution to other routes.

The traffic diversion estimates from Method B are generally considered more accurate than Method A because it considers the actual amount of traffic being rerouted (versus a model's estimation of rerouted traffic). Method B is also somewhat more conservative because it does not consider the same degree of regional redistribution that the traffic model predicts (e.g., the model shows an increase on State Route 65, which is already near capacity).

The following intersections would experience notable increases in traffic under Construction Closure Option 3:

- Foothills Boulevard/Pleasant Grove Boulevard – westbound left-turn would increase by 427 vehicles during the PM peak hour.
- Foothills Boulevard/Junction Boulevard – southbound left-turn would increase by 533 vehicles and westbound right-turn would increase by 470 vehicles during the PM peak hour.
- Roseville Parkway/Reserve Drive – eastbound right-turn would increase by 160 vehicles and northbound left-turn would increase by 140 vehicles during the PM peak hour.
- Roseville Parkway/Galleria Boulevard – northbound left-turn would increase by 185 vehicles during the PM peak hour.

The amount of diverted traffic is greater during the PM peak hour than the AM peak hour. And since weekday PM peak hour conditions are typically worse than AM peak hour conditions, the analysis of construction impacts focuses on PM peak hour conditions.

Table 9 displays the existing PM peak hour LOS at the four intersections listed above. This data was collected in April 2015 as part of the Placer Ranch Specific Plan transportation impact study. This table also shows how each intersection would operate during the construction closure. The technical calculations for this analysis are included in Appendix D.

TABLE 9: PM PEAK HOUR INTERSECTION OPERATIONS - EXISTING CONDITIONS WITH CONSTRUCTION CLOSURE OPTION 3

Intersection	Control	Existing Conditions		Existing with Option 3 Conditions	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Foothills Blvd. / Pleasant Grove Blvd.	Signal	54	D	70	E
Foothills Blvd. / Junction Blvd.	Signal	34	C	137	F
Roseville Parkway / Galleria Blvd.	Signal	52	E	85	F
Roseville Parkway / Reserve Dr.	Signal	33	C	51	D

Notes:
1. All intersections analyzed using SimTraffic except Foothills Boulevard/Junction Boulevard, which was analyzed using Synchro
2. Results shown here represent conditions with schools in session. Impacts would be reduced during periods when schools are not in session due to reduced overall levels of traffic.

Source: Fehr & Peers, 2016

As noted previously, the majority of the construction closure would occur during periods in which schools will not be in session. Thus, the level of additional delays would be somewhat less than is shown in Table 11, which reflects conditions when schools are in session.

TRAFFIC EFFECTS OF CONSTRUCTION CLOSURE OPTION 4

The following analysis methods and assumptions were used to model the potential effects of Construction Closure Option 4.

- Analysis Period: The PM peak hour was chosen because it carries a greater volume of traffic than any other hour of the day.
- Traffic Projections: Due to the likelihood that motorists would know of the construction activity and potential for delays, 50 percent of the existing PM peak hour travel demand was conservatively assumed to divert to parallel roadways.
- Traffic Operation: For analysis purposes, a temporary traffic signal is assumed in place south of the railroad undercrossing to assign right-of-way. The traffic signal at Diamond Oaks Road would serve this function on the north side. Each direction of travel would be given approximately 80 seconds of signal time, which includes the green interval, yellow interval, and then a lengthy all-red interval necessary to fully flush traffic (assumed to travel through the construction zone at no more than 25 mph) out of the lengthy reversible lane prior to allowing the opposing movement.

The SimTraffic model was used to analyze the effects of Construction Closure Option 4 under PM peak hour conditions. The model output (refer to the following page for illustration and Appendix D for technical calculations) reveals the following:

- Northbound traffic would extend beyond Kaseberg Drive and spill back to Sawtell Road. The average delay would be 302 seconds (i.e., five minutes) per vehicle.
- Southbound traffic would queue from Diamond Oaks Road through the Washington Boulevard/Pleasant Grove Boulevard intersection. The average delay on this approach would be 221 seconds per vehicle, though this result is misleading because the model assigns much of this delay to the upstream Pleasant Grove Boulevard intersection.

These delays would correspond to a LOS F condition. Should the level of redistribution to other routes not reach 50 percent (as assumed in this analysis), the extent of delays and queuing would be proportionally greater. Refer to Chapter 6 for project-specific impacts and mitigation measures associated with construction closures.

View of queuing on northbound Washington Boulevard under Construction Closure Option 4

View of queuing on southbound Washington Boulevard under Construction Closure Option 4

6. IMPACTS AND MITIGATION MEASURES

This chapter describes the project-specific and cumulatively considerable impacts of the proposed project.

PROJECT-SPECIFIC IMPACTS AND MITIGATION MEASURES

ROADWAY SYSTEM

Impact TR-1: Degraded Operations at Washington Boulevard/Pleasant Grove Boulevard Intersection

According to Table 6, the proposed project would cause PM peak hour operations to worsen from LOS D to E under existing plus project conditions. This is considered a **significant** impact.

Mitigation TR-1: Modify traffic signal timing by shifting six seconds of green time from the northbound left-turn movement to the southbound through movement.

This mitigation measure would reallocate green time on the north/south approaches to better match travel demand. It would not alter green time, splits, or offsets on the coordinated east/west Pleasant Grove Boulevard approaches. **Table 10** shows that this mitigation would reduce the PM peak hour delay from 70 to 56 seconds per vehicle (see Appendix E). Although operations would technically remain in the LOS E range, the delay would be within one-second of LOS D, which is considered acceptable. Nonetheless, this impact is considered **significant and unavoidable**.

TABLE 10: INTERSECTION OPERATIONS – EXISTING PLUS PROJECT (MITIGATED) CONDITIONS

Intersection		Existing Conditions		Existing Plus Project Conditions		Existing Plus Project Conditions With Mitigation	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
1	Washington Boulevard / Pleasant Grove Boulevard	46	D	71	E	56	E

Source: Fehr & Peers, 2016

All other intersections would continue operating acceptably under existing plus project conditions. The project would not cause the overall percentage of signalized intersections throughout the City of Roseville operating at LOS C or better during the AM and PM peak hours to fall below 70 percent.

BICYCLE SYSTEM

The proposed project would substantially improve the bicycling environment along the Washington Boulevard corridor. It would not cause any inconsistencies with policies of Roseville's Bikeway Master Plan. Therefore, impacts to the bicycle system would be **less than significant** and no mitigation is required.

PEDESTRIAN SYSTEM

The proposed project would substantially improve the walking environment along the Washington Boulevard corridor. It would not interfere with the operation of an existing pedestrian facility or preclude the construction of a planned pedestrian facility. Therefore, impacts to the pedestrian system would be **less than significant** and no mitigation is required.

TRANSIT SYSTEM

The proposed project would not modify the existing bus turnout located on the west side of Washington Boulevard south of Pleasant Grove Boulevard. Since the project would improve travel times along the Washington Boulevard corridor and expand its cross-section (particularly at the UPRR Andora underpass), it would provide the potential for bus routing along this street. It would not have a negative impact on transit operations, travel times, and/or circulation. Therefore, impacts to the transit system would be **less than significant** and no mitigation is required.

CONSTRUCTION-RELATED TRAFFIC IMPACTS

Impact TR-2: Adverse Traffic and Circulation Impacts during Construction

All four construction closure options contemplate a prolonged (multi-month) closure of Washington Boulevard at the UPRR Andora underpass. The type and severity of the impact would depend on the specific construction option that is chosen and contractor schedule/operations, which is unknown. All construction-related street closures would degrade one or more intersections to an unacceptable level and likely cause inconveniences to motorists. This is considered a **significant** impact.

Mitigation TR-2a: Prior to any construction closures, a Construction Transportation Management Plan (TMP) shall be developed and implemented. Key components of the Construction TMP would include (but are not limited to):

- Communication: Develop and implement a public information campaign that describes the duration of the street closure and recommends alternative routes. Particular attention should be placed on special events (e.g., school graduations or Placer County Fairgrounds) that may attract unfamiliar users to the City's roadway system.

- Demolition and Construction: Describe and analyze the number of employees and their site parking areas, and the number of trucks, their routing/staging, and operating hours.

- Wayfinding: Position and operate changeable message sign (CMS) trailers at strategic locations to advise motorists of the street closure and suggest alternate routes.

- Traffic Operations: To offset the adverse LOS and delay effects shown in Table 9 (i.e., assuming Construction Closure Option 3 is selected; if a different construction closure plan is selected, a different set of traffic operations improvements may be necessary), modify impacted intersections as follows (refer to discussion on following page for details):

    - Foothills Boulevard/Pleasant Grove Boulevard – Modify signal timing in response to changing travel demand.

    - Foothills Boulevard/Junction Boulevard – Modify intersection to add a second southbound left-turn lane.

- Bicycle/Pedestrian Travel: Close the multi-use path to all travelers during periods in which construction activity could pose safety concerns to those users. Advertise multi-use path closures in advance and suggest alternate routes.

- Emergency Vehicle Response: The City of Roseville Police and Fire Departments shall coordinate with the Engineering and Community Development Departments to ensure that all potential effects of the closure have been addressed including emergency vehicle routing, temporary changes in fire station servicing areas, and emergency vehicle pre-emption at signalized intersections. Fire department staff indicated that vehicles typically need to be within 750 feet of a signal to pre-empt it. Construction Closure Option 3 will be much more capable of achieving this than Construction Closure Option 4.

- Monitoring: The Construction TMP shall include a monitoring program of daily traffic volumes and speeds on Diamond Oaks Road east of Washington Boulevard. The TMP shall describe the frequency of monitoring and establish maximum acceptable thresholds for changes in operations, above which a series of temporary traffic calming measures, such as temporary speed humps, enhanced enforcement, and other measures, may be considered. The following performance standards shall be met at all times during construction:

    - Diamond Oaks Road east of Washington Boulevard experiences no more than a 2,000 ADT increase over existing volumes.
    - The median vehicular travel speed on Diamond Oaks Road east of Washington Boulevard increases by no more than 10 percent over existing conditions.
    - Traffic signal timings at the Washington Boulevard/Pleasant Grove Boulevard and Washington Boulevard/Junction Boulevard intersections are adjusted in response to the change in travel demand.
    - Construction-related trucks access the work site via Washington Boulevard, and not adjacent neighborhood streets.
    - The combination of public outreach and changeable message sign (CMS) trailers enables the general public to be aware of construction-related street closures and select alternate routes.
    - Public transit and emergency provider service times are not adversely affected, based on the performance standards used by those entities.
    - The multi-use path remains open and free of debris during periods in which construction operation does not pose any safety hazards to the facility.

Table 11 displays the effectiveness of the two intersection improvements described above. Refer to Appendix E for technical calculations. A five-second shift in green time from the eastbound through to the westbound left-turn movement at the Foothills Boulevard/Pleasant Grove Boulevard intersection would reduce the average delay from 70 to 61 seconds. The addition of a second southbound left-turn lane at the Foothills Boulevard/Junction Boulevard intersection would better accommodate the projected left-turn movement of 737 vehicles during the PM peak hour, thereby reducing the delay from 137 to 49 seconds per vehicle. Mark Thomas & Company has prepared a conceptual layout that would temporarily accommodate the second lane through lane narrowing.

Improvements (both physical and signal timing-related) were considered at the Roseville Parkway/Reserve Drive and Roseville Parkway/Galleria Boulevard intersections. This would represent an eight percent and five percent increase in PM peak hour traffic, respectively, at each intersection. Any physical improvements would be complicated and temporary, and any signal timing improvements would be difficult to implement without adversely affecting overall Roseville Parkway corridor operations. Therefore, no improvements were identified as being feasible at those intersections for this temporary impact.

TABLE 11: PM PEAK HOUR INTERSECTION OPERATIONS - EXISTING CONDITIONS WITH CONSTRUCTION CLOSURE OPTION 3 AND MITIGATION

Intersection	Control	Existing Conditions		Existing Conditions with Construction Closure Option 3			
				Without Mitigation		With Mitigation	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Foothills Blvd. / Pleasant Grove Blvd.	Signal	54	D	70	E	61	E
Foothills Blvd. / Junction Blvd.	Signal	34	C	137	F	49	D
Roseville Parkway / Galleria Blvd.	Signal	52	E	85	F	-	-
Roseville Parkway / Reserve Dr.	Signal	33	C	51	D	-	-

Notes:
1. All intersections analyzed using SimTraffic except Foothills Boulevard/Junction Boulevard, which was analyzed using Synchro (consistent with prior analysis of intersection).
2. Results shown here represent conditions with schools in session. Impacts would be reduced during periods when schools are not in session due to reduced overall levels of traffic.
3. Refer to above text for description of mitigations.
4. The above dashes imply that no feasible mitigation is available given severity and duration of temporary impact.

Source: Fehr & Peers, 2016

Although Mitigation Measure TR-2 would effectively mitigate the majority of construction-related traffic and circulation impacts, Impact TR-2 would remain **significant and unavoidable** due to the lack of feasible mitigation at the Roseville Parkway/Reserve Drive and Roseville Parkway/Galleria Boulevard intersections. It should be noted that selection of a different construction closure option would have different impacts and mitigation measures.

EMERGENCY VEHICLE ACCESS IMPACTS

Impact TR-3: Inadequate Emergency Vehicle Access

Mitigation: Implement Mitigation Measure TR-2

Mitigation Measure TR-2 includes a Construction TMP that would include a section on Emergency Vehicle Access and Response. It also includes performance standards relating to adequacy of emergency vehicle response that must be maintained at all times during construction. Therefore, Impact TR-3 would be reduced to a **less-than-significant** level with implementation of Mitigation Measure TR-2.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

ROADWAY SYSTEM

Impact TR-4: Cumulatively Degraded Operations at Washington Boulevard/Pleasant Grove Boulevard Intersection

According to Table 8, the proposed project would exacerbate (i.e., add 53 seconds of delay) LOS F conditions at the Washington Boulevard/Pleasant Grove Boulevard intersection during the PM peak hour. This is considered a **significant** impact.

Mitigation: None available

The addition of a third southbound through lane was considered as a potential mitigation measure as it is currently included in the City's CIP. The third southbound approach lane could be provided by redesignating the existing right-turn lane as a through/right lane. However, provision of a third southbound receiving lane would require widening in the southwest quadrant of the intersection, which would require additional right-of-way and cost. It would also eliminate the bus turnout that is currently constructed. Additionally, while it would offer some additional capacity benefit, the City has indicated that comparable installations have resulted in imbalanced lane utilization and marginal intersection capacity benefit.

For these reasons, the City has concluded that the overall benefits of the project outweigh the cumulatively significant impact that would occur at the Washington Boulevard/Pleasant Grove Boulevard intersection and that the adverse effects of adding a third southbound through lane would

exceed the operational benefits it would provide. Accordingly, this impact would be considered **significant and unavoidable**.

The City's General Plan Circulation Element should be modified to indicate that the following intersections will operate worse than LOS C:

- Washington Boulevard/Pleasant Grove Boulevard: LOS D during the AM peak hour and LOS F during the PM peak hour.
- Washington Boulevard/Junction Boulevard: LOS D during the PM peak hour.

It should be noted that these operations would occur whether or not the proposed project is implemented. Accordingly, the project would not cause these conditions itself.

All other study intersections would continue operating acceptably under cumulative plus project conditions. The project would not cause the overall percentage of signalized intersections throughout the City of Roseville operating at LOS C or better during the AM and PM peak hours to fall below 70 percent.

BICYCLE SYSTEM

The proposed project would substantially improve the bicycling environment along the Washington Boulevard corridor. It would not preclude construction of any planned bikeway facilities as identified in the City of Roseville's Bikeway Master Plan. Therefore, impacts to the bicycle system would be **less than significant** and no mitigation is required.

PEDESTRIAN SYSTEM

The proposed project would substantially improve the walking environment along the Washington Boulevard corridor. It would not interfere with the operation of an existing pedestrian facility or preclude the construction of a planned pedestrian facility. Therefore, impacts to the pedestrian system would be **less than significant** and no mitigation is required.

TRANSIT SYSTEM

The proposed project would not modify the existing bus turnout located on the west side of Washington Boulevard south of Pleasant Grove Boulevard. Since the project would improve travel times along the Washington Boulevard corridor and expand its cross-section (particularly at the UPRR

Andora underpass), it would provide the potential for bus routing along this street. It would not have a negative impact on transit operations, travel times, and/or circulation. Therefore, impacts to the transit system would be **less than significant** and no mitigation is required.

CONSTRUCTION-RELATED TRAFFIC IMPACTS

Since project construction would occur well in advance of the cumulative horizon year, cumulative impacts associated with construction are not applicable.

EMERGENCY VEHICLE ACCESS IMPACTS

The project would not adversely affect emergency vehicle access and response times. While impacts are possible during construction, that condition does not pertain to cumulative conditions. Therefore, cumulative impacts associated with emergency vehicle access are not applicable.

TECHNICAL APPENDIX

APPENDIX A

EXISTING CONDITIONS

SimTraffic Post-Processor **Washington Andora Widening**
Average Results from 10 Runs **Existing Conditions**
Volume and Delay by Movement **AM Peak Hour**

Intersection 1 **Washington Blvd/Pleasant Grove Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	201	206	102.3%	48.5	3.6	D
	Through	468	481	102.7%	35.6	4.0	D
	Right Turn	282	278	98.5%	7.3	0.7	A
	Subtotal	951	964	101.4%	30.2	1.8	C
SB	Left Turn	76	71	94.0%	53.5	6.8	D
	Through	442	449	101.5%	39.2	5.7	D
	Right Turn	207	212	102.3%	14.7	2.0	B
	Subtotal	725	732	100.9%	33.5	4.9	C
EB	Left Turn	199	185	93.0%	61.2	9.6	E
	Through	1,418	1,330	93.8%	34.1	8.5	C
	Right Turn	193	189	97.9%	21.9	4.2	C
	Subtotal	1,810	1,704	94.2%	35.6	7.0	D
WB	Left Turn	92	86	92.9%	55.6	12.3	E
	Through	874	820	93.9%	30.0	4.0	C
	Right Turn	67	65	97.6%	8.8	0.8	A
	Subtotal	1,033	971	94.0%	30.9	4.3	C
Total		4,519	4,372	96.7%	33.0	2.7	C

Intersection 2 **Washington Blvd/Emerald Oak Rd-Diamond Oaks Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	5	4	83.6%	34.4	27.9	C
	Through	765	756	98.8%	19.0	3.8	B
	Right Turn	37	40	107.8%	9.2	3.2	A
	Subtotal	807	800	99.1%	18.6	3.8	B
SB	Left Turn	109	109	99.7%	48.6	4.6	D
	Through	618	599	97.0%	16.1	1.6	B
	Right Turn						
	Subtotal	727	708	97.4%	21.1	1.8	C
EB	Left Turn	8	10	123.5%	38.8	22.3	D
	Through	6	6	101.3%	38.4	31.2	D
	Right Turn	16	14	85.5%	10.6	13.1	B
	Subtotal	30	30	98.8%	29.0	10.4	C
WB	Left Turn	62	62	100.5%	38.9	7.5	D
	Through	1	1	76.0%	4.3	7.5	A
	Right Turn	178	180	101.2%	19.9	4.7	B
	Subtotal	241	243	100.9%	24.8	4.2	C
Total		1,805	1,781	98.7%	20.6	2.1	C

SimTraffic Post-Processor **Washington Andora Widening**
Average Results from 10 Runs **Existing Conditions**
Volume and Delay by Movement **AM Peak Hour**

Intersection 3 **Washington Blvd/Kaseberg Dr** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	28	25	90.9%	11.8	4.1	B
	Through	786	774	98.5%	6.5	0.9	A
	Right Turn						
	Subtotal	814	800	98.3%	6.7	0.9	A
SB	Left Turn						
	Through	690	652	94.4%	0.6	0.2	A
	Right Turn	6	5	82.3%	0.0	0.1	A
	Subtotal	696	657	94.3%	0.6	0.2	A
EB	Left Turn	21	22	106.8%	10.8	4.4	B
	Through						
	Right Turn	36	39	108.7%	7.3	3.1	A
	Subtotal	57	62	108.0%	8.9	2.5	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,567	1,518	96.9%	4.2	0.5	A

Intersection 4 **Washington Blvd/Sawtell Rd-Derek Pl** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	30	26	87.4%	33.5	10.4	C
	Through	759	747	98.5%	5.6	0.8	A
	Right Turn	42	49	117.6%	2.8	1.0	A
	Subtotal	831	823	99.0%	6.4	0.8	A
SB	Left Turn	19	13	68.0%	33.7	20.0	C
	Through	685	647	94.4%	11.2	4.8	B
	Right Turn	22	33	148.5%	6.9	3.2	A
	Subtotal	726	692	95.4%	11.5	4.4	B
EB	Left Turn	46	45	97.5%	28.1	7.2	C
	Through	22	25	114.0%	28.3	6.5	C
	Right Turn	84	88	105.0%	7.2	1.1	A
	Subtotal	152	158	104.0%	16.8	3.7	B
WB	Left Turn	16	18	111.6%	26.9	10.4	C
	Through	1	1	76.0%	9.1	20.1	A
	Right Turn	9	12	130.9%	6.8	5.2	A
	Subtotal	26	30	116.9%	20.3	9.4	C
Total		1,735	1,704	98.2%	9.7	2.1	A

Intersection 5 **Washington Blvd/Junction Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	152	144	95.0%	22.6	2.3	C
	Through	597	590	98.8%	5.6	0.8	A
	Right Turn						
	Subtotal	749	734	98.0%	9.0	0.9	A
SB	Left Turn	3	1	25.3%	3.2	7.4	A
	Through	658	621	94.4%	12.7	1.9	B
	Right Turn	124	136	110.0%	5.2	1.1	A
	Subtotal	785	758	96.6%	11.3	1.6	B
EB	Left Turn	232	241	103.8%	20.4	3.5	C
	Through	1	0	0.0%	0.0	0.0	A
	Right Turn	429	454	105.9%	3.1	0.3	A
	Subtotal	662	695	105.0%	9.1	1.4	A
WB	Left Turn	2	1	38.0%	6.5	15.2	A
	Through	2	1	57.0%	4.7	10.9	A
	Right Turn	2	3	133.0%	2.9	5.3	A
	Subtotal	6	5	76.0%	11.5	14.6	B
Total		2,202	2,193	99.6%	9.8	1.0	A

Intersection 1 **Washington Blvd/Pleasant Grove Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	242	222	91.5%	51.8	4.1	D
	Through	370	357	96.5%	40.8	3.4	D
	Right Turn	370	367	99.3%	7.6	0.7	A
	Subtotal	982	946	96.4%	30.4	1.9	C
SB	Left Turn	172	182	105.8%	65.0	9.0	E
	Through	603	609	101.0%	54.8	8.3	D
	Right Turn	227	238	104.8%	29.9	4.6	C
	Subtotal	1,002	1,029	102.7%	50.8	7.3	D
EB	Left Turn	165	154	93.0%	67.8	8.1	E
	Through	1,464	1,433	97.9%	51.3	9.3	D
	Right Turn	195	187	96.1%	41.8	8.1	D
	Subtotal	1,824	1,773	97.2%	51.8	8.5	D
WB	Left Turn	335	333	99.4%	60.9	8.3	E
	Through	1,628	1,626	99.9%	43.6	7.7	D
	Right Turn	58	59	100.9%	19.1	4.5	B
	Subtotal	2,021	2,017	99.8%	45.7	7.4	D
Total		5,829	5,766	98.9%	46.0	4.1	D

Intersection 2 **Washington Blvd/Emerald Oak Rd-Diamond Oaks Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	12	17	139.3%	53.6	13.4	D
	Through	823	808	98.1%	22.2	5.6	C
	Right Turn	88	86	97.2%	13.8	4.7	B
	Subtotal	923	910	98.6%	21.9	5.5	C
SB	Left Turn	144	135	93.4%	63.1	7.3	E
	Through	975	947	97.1%	32.4	6.1	C
	Right Turn	14	14	100.4%	24.7	4.0	C
	Subtotal	1,133	1,095	96.7%	36.1	6.1	D
EB	Left Turn	5	2	45.6%	19.2	25.3	B
	Through	2	2	114.0%	26.8	31.1	C
	Right Turn	9	8	84.4%	21.3	16.0	C
	Subtotal	16	12	76.0%	26.7	17.4	C
WB	Left Turn	82	79	96.9%	40.5	6.5	D
	Through	2	2	95.0%	10.2	14.4	B
	Right Turn	154	156	101.2%	19.5	2.5	B
	Subtotal	238	237	99.6%	26.4	2.1	C
Total		2,310	2,254	97.6%	29.3	5.0	C

SimTraffic Post-Processor **Washington Andora Widening**
Average Results from 10 Runs **Existing Conditions**
Volume and Delay by Movement **PM Peak Hour**

Intersection 3 **Washington Blvd/Kaseberg Dr** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	35	34	96.6%	20.3	5.3	C
	Through	913	915	100.3%	8.5	2.4	A
	Right Turn						
	Subtotal	948	949	100.1%	8.9	2.3	A
SB	Left Turn						
	Through	1,036	999	96.4%	1.4	0.3	A
	Right Turn	30	34	114.0%	0.1	0.1	A
	Subtotal	1,066	1,033	96.9%	1.4	0.3	A
EB	Left Turn	10	9	87.4%	23.4	14.3	C
	Through						
	Right Turn	42	41	96.8%	17.8	10.6	C
	Subtotal	52	49	95.0%	19.4	10.6	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,066	2,031	98.3%	5.3	1.1	A

Intersection 4 **Washington Blvd/Sawtell Rd-Derek Pl** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	50	50	100.3%	39.9	12.6	D
	Through	869	881	101.4%	5.1	1.3	A
	Right Turn	22	22	101.9%	2.4	0.7	A
	Subtotal	941	954	101.4%	6.9	1.7	A
SB	Left Turn	16	17	109.3%	47.7	23.2	D
	Through	1,028	992	96.5%	11.1	1.8	B
	Right Turn	34	29	83.8%	8.8	3.3	A
	Subtotal	1,078	1,038	96.3%	11.7	1.9	B
EB	Left Turn	62	62	99.3%	30.5	6.7	C
	Through	1	0	0.0%	0.0	0.0	A
	Right Turn	25	19	77.5%	10.0	4.9	A
	Subtotal	88	81	92.0%	25.6	4.8	C
WB	Left Turn	37	30	81.1%	37.8	5.3	D
	Through	3	3	101.3%	19.5	28.9	B
	Right Turn	17	20	118.5%	11.1	5.5	B
	Subtotal	57	53	93.3%	26.8	4.8	C
Total		2,164	2,126	98.2%	10.5	1.6	B

SimTraffic Post-Processor **Washington Andora Widening**
Average Results from 10 Runs **Existing Conditions**
Volume and Delay by Movement **PM Peak Hour**

Intersection 5 **Washington Blvd/Junction Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	508	497	97.9%	23.5	2.6	C
	Through	683	712	104.2%	4.3	1.1	A
	Right Turn						
	Subtotal	1,191	1,209	101.5%	12.2	1.2	B
SB	Left Turn	4	2	47.5%	12.0	19.4	B
	Through	842	828	98.3%	22.0	3.4	C
	Right Turn	244	222	91.1%	10.4	1.2	B
	Subtotal	1,090	1,052	96.5%	19.6	3.1	B
EB	Left Turn	255	236	92.5%	32.3	4.7	C
	Through	1	2	190.0%	9.3	25.0	A
	Right Turn	239	238	99.7%	1.8	0.1	A
	Subtotal	495	476	96.2%	16.9	2.2	B
WB	Left Turn	4	6	152.0%	42.5	17.7	D
	Through	4	2	47.5%	22.9	35.1	C
	Right Turn	3	3	114.0%	5.6	7.2	A
	Subtotal	11	11	103.6%	32.1	11.7	C
Total		2,787	2,749	98.6%	15.9	1.7	B

CITY OF ROSEVILLE CALIFORNIA

PUBLIC WORKS DEPT.

TRAFFIC ENGINEERING AND SPEED MAP

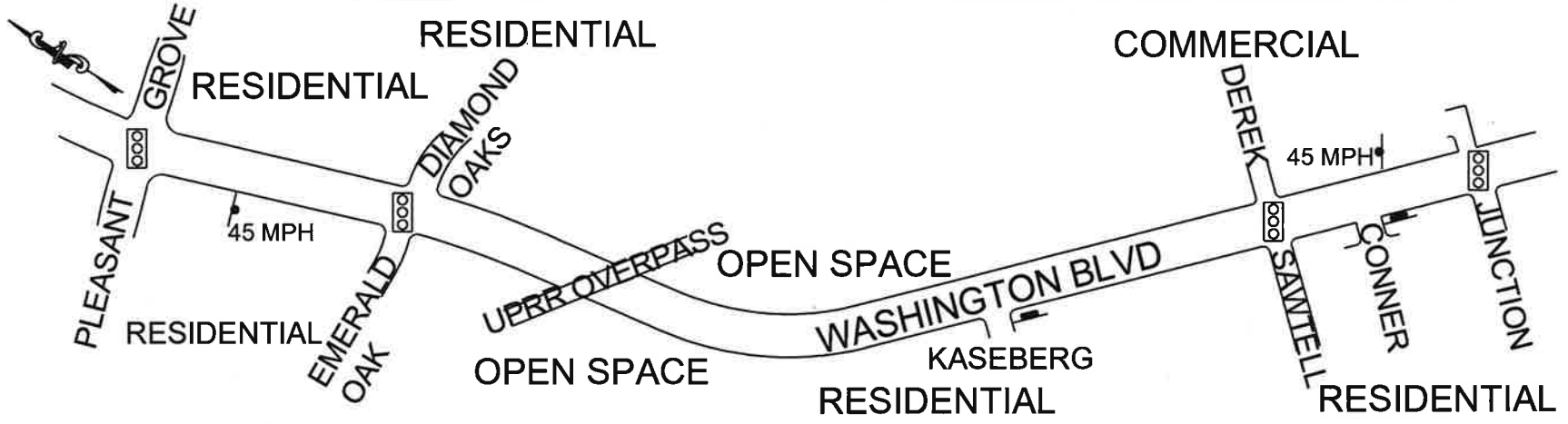
SPEED ZONE SURVEY

ROAD NAME:

WASHINGTON BL

JUNCTION TO PLEASANT GROVE

STRIP MAP



ROADWAY WIDTH	VARIES 40' TO 60'
NO. OF LANES	VARIES 2 TO 4
AADT	18,532
DIVIDER TYPE	PAINTED
CRITICAL SPEED (85th %)	50.1 MPH
PACE SPEED	41-50 MPH
3-YEAR ACCIDENT HISTORY	10
EXISTING SPEED LIMIT	45 MPH
RECOM. SPEED LIMIT	45 MPH
SEGMENT LENGTH	1.04 MI.

LEGEND STOP SIGNS SPEED LIMIT SIGN TRAFFIC SIGNAL

MPH	
61-75	1
51-60	30
41-50	139
31-40	10
1-30	0

ROADSIDE COND.

- SCHOOL ☐
- RESIDENCE ☒
- BUSINESS ☒
- PARKS ☐
- OPEN SPACE ☒
- BIKEWAY ☐

COMMENTS: NO PARKING ON BOTH SIDES OF STREET.

SOME RECOVERY AREA ☒ NO RECOVERY AREA ☐

SCHOOL ROUTE ☐

2014 Traffic Engineering and Speed Map - Speed Zone Survey

City of Roseville
Engineering and Traffic Survey
Summary

Street: WASHINGTON BL
Limits: JUNCTION BL
PLEASANT GROVE BL

Field Observer T TRELEVEN
Checked By:
Date: 1/14/2014

Factors	Direction: North/South		
A. Prevailing Speed Data			
Location of Survey	900' Northwest of Kaseberg Dr		
85th Percentile	50.1		
10 mph Pace	41 - 50		
Percent in Pace	79.5%		
Posted Speed Limit	45		
B. Collision History			
Date Range Covered	12/1/2010	To 11/30/2013	(3 years)
Total Collisions	10		
Collision Rate (Acc/MVM)	0.475		
Expected Collision Rate	1.75		
C. Traffic Factors			
Average Daily Traffic	18532		
Length of Segment	5472		
Lane Configuration	Single Lane Each Direction		
Street Classification	Arterial		
D. Conditions Not Readily Apparent			
Conditions	See: Roadside Conditions on the Speed Zone Survey Map		
Roadway Geometrics	Horizontal Curve		
Comments	Narrow underpath.		
E. Adjacent Land Use	Single Family and Multi-Family Residential; Open Space.		
Posted Speed Limit	45		
Speed Limit Change?	No		
Revised Speed Limit			

Approved and Authorized for release by City of Roseville Traffic Engineering Department:

Juan Cervantes T.E. 3-19-14

Date

Loc. #

City of Roseville

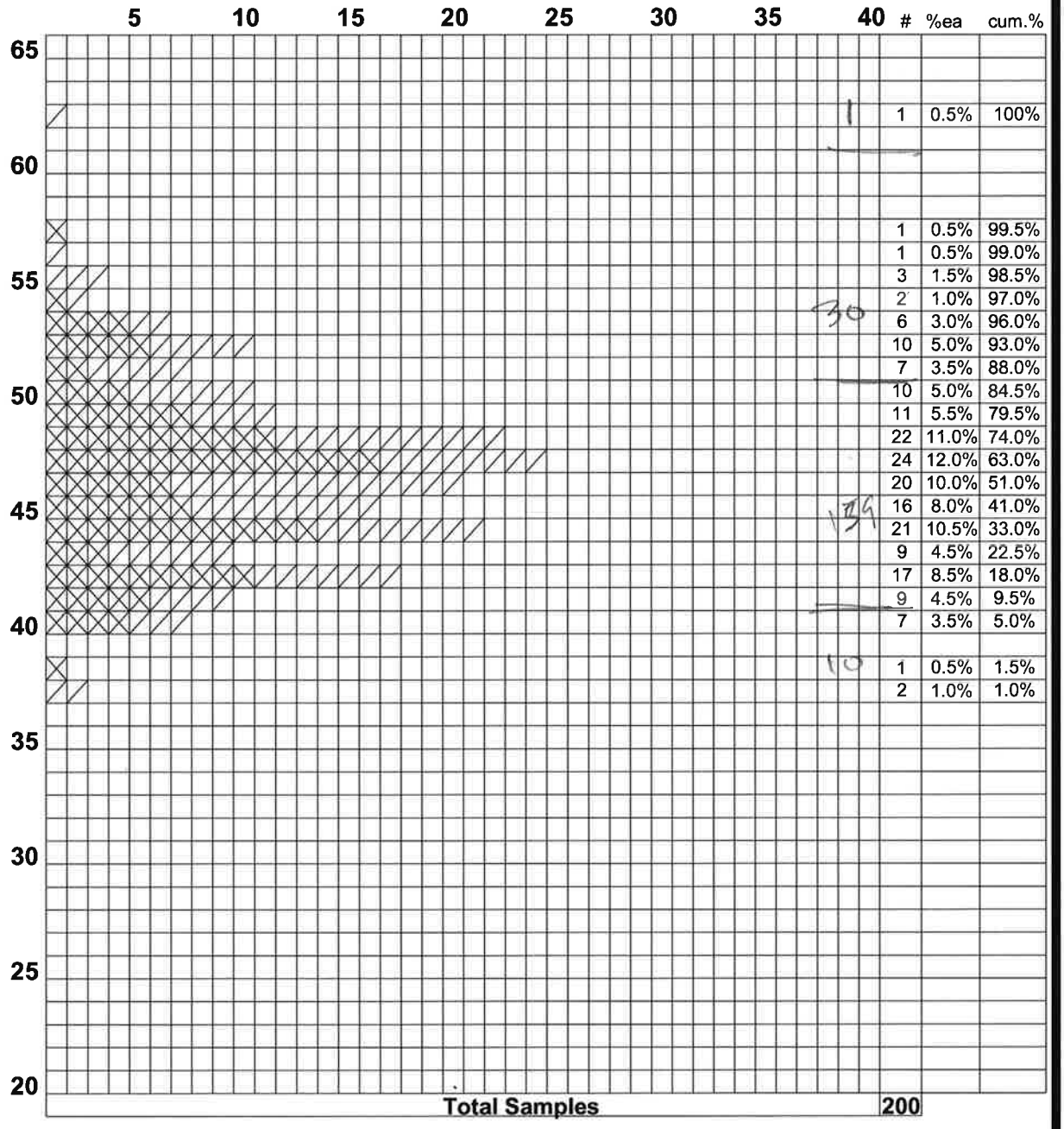
Traffic Engineering Department

Street Name: WASHINGTON BL

Limits: JUNCTION BL to PLEASANT GROVE BL

Radar Survey Sheet

X=North /=South



#	%ea	cum.%
1	0.5%	100%
1	0.5%	99.5%
1	0.5%	99.0%
3	1.5%	98.5%
2	1.0%	97.0%
6	3.0%	96.0%
10	5.0%	93.0%
7	3.5%	88.0%
10	5.0%	84.5%
11	5.5%	79.5%
22	11.0%	74.0%
24	12.0%	63.0%
20	10.0%	51.0%
16	8.0%	41.0%
21	10.5%	33.0%
9	4.5%	22.5%
17	8.5%	18.0%
9	4.5%	9.5%
7	3.5%	5.0%
1	0.5%	1.5%
2	1.0%	1.0%
Total Samples	200	

85th Percentile Speed:	50.1
50th Percentile Speed:	45.9
15th Percentile Speed:	41.6
10 MPH Pace:	41- 50
Number in Pace:	159
Percent in Pace:	79.5%

Date of Survey:	1/14/2014	Start Time:	14:23
Weather:	Clear	End Time:	15:02
Road Condition:	Good	Posted Speed:	45
Street Class.:	Arterial	Observer:	T TRELEVEN
Conditions not Apparent:	See: Roadside Conditions on the Speed Zone Survey Map		

City of Roseville
Traffic Engineering Department
Radar Speed Data Worksheet

Date: 1/14/14 Location #

Street Name: Washington Bl Observer:

Limits: Junction to Pleasant Grove Location of Survey: 900' NW of Kaseberg

Weather: Roadway Geometrics:

Road Cond: Conditions Not Apparent:

Posted Speed: Start Time: 2:23

Lane Config: End Time: 3:02

Adjacent Land Use:

Street Classification: Arterial - Collector - Local

Average Daily Traffic:

Segment Length:

Speed Limit Changed? Yes - No

Revised Limit:

Checked By:

Collision Start Date:

Collision End Date:

Collision Period:

Total Collisions:

Collision Rate:

Expected Collision Rate:

Direction: ~~SB~~ NB

1. 46	21. 44	41. 48	61. 46	81. 44
2. 48	22. 47	42. 41	62. 45	82. 44
3. 40	23. 44	43. 46	63. 43	83. 46
4. 44	24. 42	44. 42	64. 44	84. 48
5. 50	25. 43	45. 40	65. 52	85. 47
6. 46	26. 53	46. 52	66. 49	86. 41
7. 42	27. 41	47. 46	67. 52	87. 53
8. 50	28. 49	48. 47	68. 42	88. 47
9. 44	29. 41	49. 44	69. 43	89. 48
10. 42	30. 45	50. 50	70. 42	90. 40
11. 53	31. 48	51. 47	71. 44	91. 47
12. 47	32. 40	52. 49	72. 47	92. 44
13. 51	33. 45	53. 38	73. 42	93. 44
14. 47	34. 48	54. 49	74. 42	94. 48
15. 51	35. 45	55. 53	75. 49	95. 44
16. 44	36. 42	56. 54	76. 41	96. 47
17. 47	37. 47	57. 47	77. 51	97. 42
18. 45	38. 48	58. 47	78. 50	98. 52
19. 47	39. 49	59. 48	79. 45	99. 48
20. 49	40. 45	60. 48	80. 47	100. 52

Direction: SB

1. 46	21. 46	41. 46	61. 46	81. 37
2. 40	22. 62	42. 46	62. 47	82. 45
3. 55	23. 49	43. 44	63. 52	83. 48
4. 51	24. 47	44. 56	64. 48	84. 50
5. 52	25. 50	45. 41	65. 48	85. 48
6. 45	26. 45	46. 49	66. 42	86. 47
7. 43	27. 44	47. 47	67. 42	87. 46
8. 49	28. 46	48. 42	68. 44	88. 41
9. 55	29. 49	49. 46	69. 43	89. 41
10. 52	30. 46	50. 48	70. 44	90. 50
11. 53	31. 37	51. 48	71. 50	91. 51
12. 48	32. 52	52. 50	72. 44	92. 47
13. 44	33. 47	53. 41	73. 44	93. 46
14. 50	34. 42	54. 48	74. 48	94. 42
15. 52	35. 51	55. 55	75. 45	95. 53
16. 43	36. 45	56. 47	76. 40	96. 45
17. 45	37. 47	57. 48	77. 46	97. 42
18. 44	38. 48	58. 43	78. 45	98. 46
19. 43	39. 41	59. 54	79. 42	99. 48
20. 40	40. 46	60. 51	80. 43	100. 51

Comments:

APPENDIX B

EXISTING PLUS PROJECT CONDITIONS

LEGEND/ ABBREVIATIONS

BC/EC	BEGIN CURVE / END CURVE
BVC/EVC	BEGIN VERTICAL CURVE / END VERTICAL CURVE
PVI	POINT OF VERTICAL INTERSECTION
LD	LINE DATA (SEE TABLE)
CD	CURVE DATA (SEE TABLE)
DG	DECOMPOSED GRANITE
AB	AGGREGATE BASE
HMA	HOT MIXED ASPHALT
CG	CURB AND GUTTER
SW	SIDEWALK
OG	ORIGINAL GROUND
FG	FINISHED GRADE

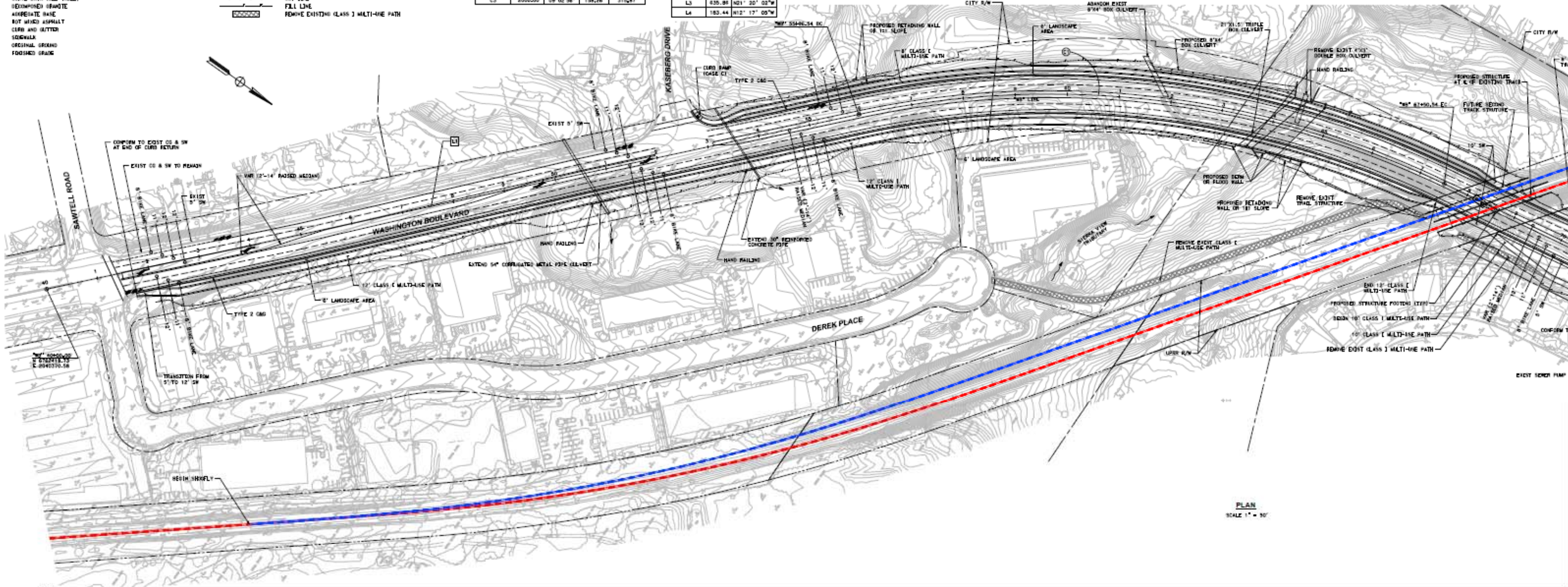
CITY RIGHT-OF-WAY
UPRR RIGHT-OF-WAY
EXISTING TRACK
PROPOSED SHOOFLY TRACK
CUT LINE
FILL LINE
REMOVE EXISTING CLASS 1 MULTI-USE PATH

CURVE DATA

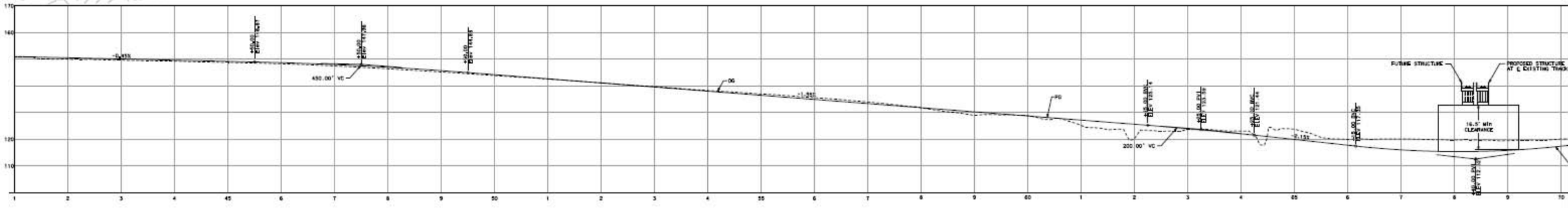
CURVE #	RADIUS	Δ	TANGENT	LENGTH
C1	1750.00	31°46'51"	598.66'	1164.00'
C2	1750.00	11°40'33"	178.93'	356.62'
C3	2000.00	09°02'56"	158.26'	315.67'

LINE DATA

LINE	LENGTH	BEARING
L1	1586.34	N47° 26' 25"W
L2	584.93	N9° 39' 28"W
L3	635.86	N21° 20' 02"W
L4	183.44	N12° 17' 05"W



PLAN
SCALE 1" = 50'

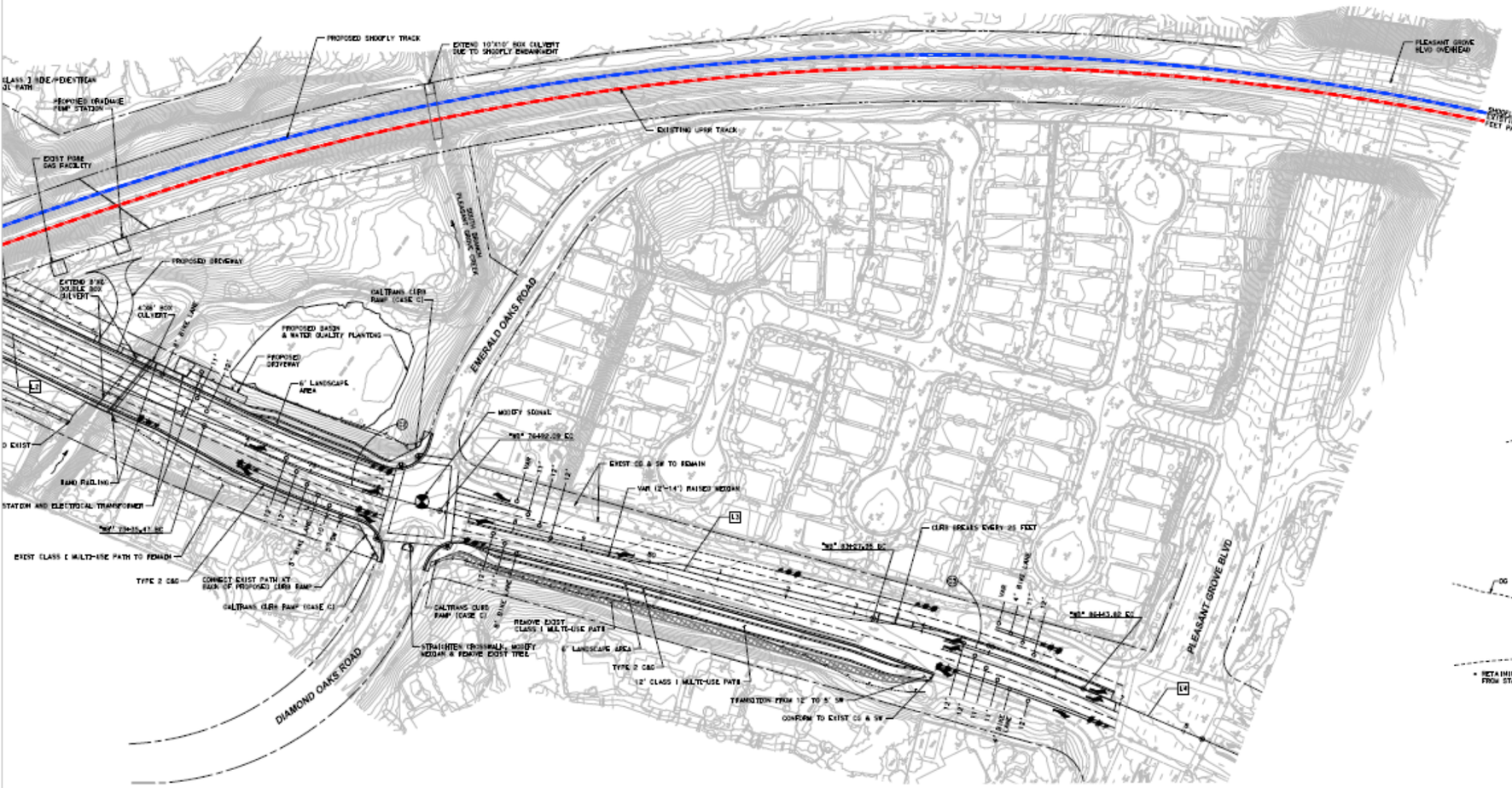


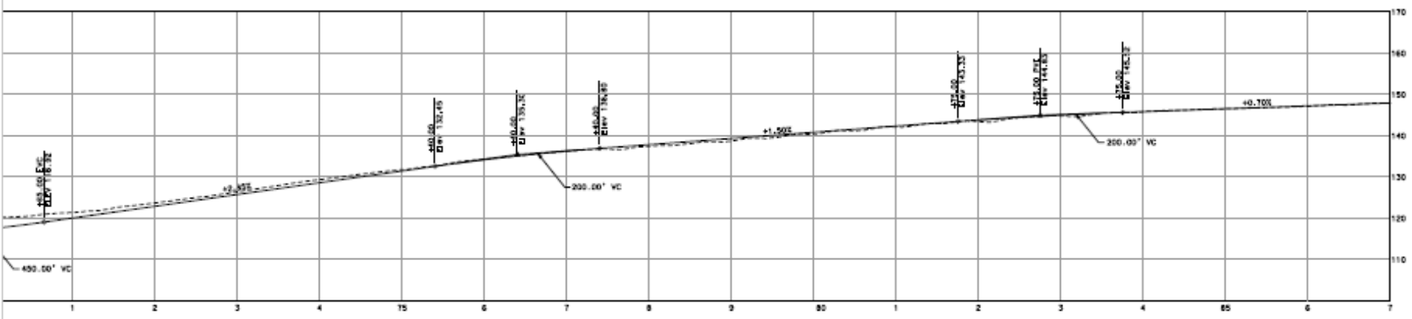
"WB" LINE PROFILE
SCALE H = 1"=50'
V = 1"=5'

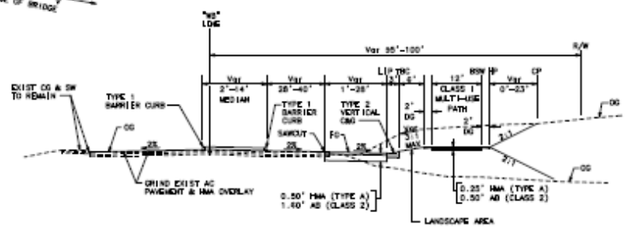
CITY OF ROSEVILLE
WASHINGTON/ANDORA WIDENING
EXHIBIT "A"

MARK THOMAS & COMPANY

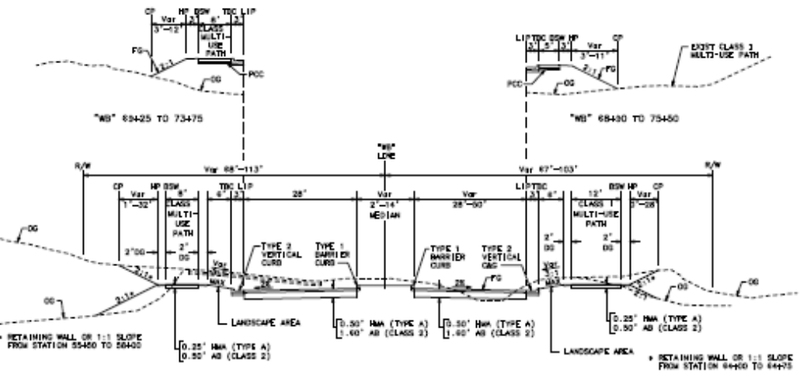
DRAWN BY	PJ	JOB NO.	SHEET NO.
CHK'd BY	JT	5810.02	1
DATE	05/05/2016	FILE NO.	OF
SCALE	"=60'		1



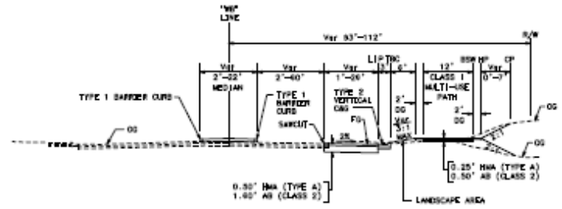




WASHINGTON BLVD
"WB" 41+66 to 52+00



WASHINGTON BLVD
"WB" 52+00 to 75+50



WASHINGTON BLVD
"WB" 75+50 to 84+34

TYPICAL CROSS SECTIONS
NO SCALE

SimTraffic Post-Processor **Washington Andora Widening**
Average Results from 10 Runs **Existing Plus Project Conditions**
Volume and Delay by Movement **AM Peak Hour**

Intersection 1 **Washington Blvd/Pleasant Grove Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	208	216	103.8%	47.0	6.4	D
	Through	638	633	99.2%	36.0	5.1	D
	Right Turn	369	364	98.7%	8.7	0.9	A
	Subtotal	1,215	1,213	99.8%	29.8	4.3	C
SB	Left Turn	74	70	94.0%	59.0	7.4	E
	Through	564	581	103.0%	46.1	5.6	D
	Right Turn	98	103	105.5%	15.3	3.5	B
	Subtotal	736	754	102.4%	43.0	5.0	D
EB	Left Turn	52	48	92.8%	61.3	14.1	E
	Through	1,350	1,262	93.5%	34.9	10.0	C
	Right Turn	205	203	99.0%	24.9	5.5	C
	Subtotal	1,607	1,513	94.1%	34.4	8.7	C
WB	Left Turn	176	175	99.3%	50.4	5.3	D
	Through	798	739	92.7%	28.8	3.9	C
	Right Turn	64	57	89.7%	9.3	1.0	A
	Subtotal	1,038	972	93.6%	31.6	2.9	C
Total		4,596	4,451	96.8%	34.0	2.2	C

Intersection 2 **Washington Blvd/Emerald Oak Rd-Diamond Oaks Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	5	6	121.6%	31.9	27.1	C
	Through	1,028	977	95.0%	12.6	1.7	B
	Right Turn	35	38	108.6%	5.8	2.0	A
	Subtotal	1,068	1,021	95.6%	12.5	1.7	B
SB	Left Turn	110	107	97.1%	39.1	4.6	D
	Through	835	830	99.4%	10.3	2.0	B
	Right Turn						
	Subtotal	945	937	99.1%	13.6	1.7	B
EB	Left Turn	8	8	95.0%	32.1	29.4	C
	Through	6	5	82.3%	31.9	28.5	C
	Right Turn	16	12	73.6%	8.8	7.0	A
	Subtotal	30	24	81.1%	26.3	8.8	C
WB	Left Turn	62	63	101.1%	37.9	11.6	D
	Through	1	1	114.0%	10.1	27.0	B
	Right Turn	179	188	104.9%	13.2	3.6	B
	Subtotal	242	252	104.0%	19.4	3.8	B
Total		2,285	2,233	97.7%	13.9	1.4	B

SimTraffic Post-Processor **Washington Andora Widening**
Average Results from 10 Runs **Existing Plus Project Conditions**
Volume and Delay by Movement **AM Peak Hour**

Intersection 3 **Washington Blvd/Kaseberg Dr** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	28	27	96.4%	8.0	3.3	A
	Through	1,047	1,009	96.4%	2.7	0.7	A
	Right Turn						
	Subtotal	1,075	1,036	96.4%	2.8	0.6	A
SB	Left Turn						
	Through	907	872	96.2%	4.4	0.7	A
	Right Turn	6	7	120.3%	4.0	0.7	A
	Subtotal	913	879	96.3%	4.4	0.7	A
EB	Left Turn	21	20	94.1%	15.3	6.4	C
	Through						
	Right Turn	36	33	92.9%	7.1	4.8	A
	Subtotal	57	53	93.3%	10.5	4.1	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,045	1,968	96.3%	3.7	0.5	A

Intersection 4 **Washington Blvd/Sawtell Rd-Derek Pl** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	30	29	97.5%	36.2	8.7	D
	Through	1,019	988	96.9%	6.8	1.8	A
	Right Turn	37	45	121.2%	3.4	1.0	A
	Subtotal	1,086	1,062	97.8%	7.5	1.9	A
SB	Left Turn	24	26	109.3%	42.1	6.5	D
	Through	897	864	96.3%	8.6	4.4	A
	Right Turn	22	21	95.0%	7.5	7.0	A
	Subtotal	943	911	96.6%	9.5	4.2	A
EB	Left Turn	46	40	86.7%	31.4	5.8	C
	Through	22	22	100.2%	33.7	12.1	C
	Right Turn	84	82	98.2%	9.8	4.0	A
	Subtotal	152	144	95.0%	19.1	4.6	B
WB	Left Turn	16	16	99.8%	36.5	12.8	D
	Through	1	0	0.0%	0.0	0.0	A
	Right Turn	10	10	95.0%	5.3	3.4	A
	Subtotal	27	25	94.3%	24.1	7.7	C
Total		2,208	2,143	97.0%	9.4	2.2	A

SimTraffic Post-Processor **Washington Andora Widening**
Average Results from 10 Runs **Existing Plus Project Conditions**
Volume and Delay by Movement **AM Peak Hour**

Intersection 5 **Washington Blvd/Junction Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	147	143	97.5%	31.0	2.9	C
	Through	618	608	98.4%	9.2	2.0	A
	Right Turn						
	Subtotal	765	751	98.2%	13.4	1.7	B
SB	Left Turn	3	3	101.3%	5.9	11.3	A
	Through	682	665	97.5%	14.1	2.1	B
	Right Turn	312	301	96.5%	8.6	1.2	A
	Subtotal	997	969	97.2%	12.5	1.5	B
EB	Left Turn	466	443	95.0%	22.4	2.8	C
	Through	1	1	114.0%	7.6	17.7	A
	Right Turn	412	423	102.7%	3.2	0.4	A
	Subtotal	879	867	98.6%	13.0	1.7	B
WB	Left Turn	2	0	19.0%	4.0	12.6	A
	Through	2	2	114.0%	18.5	31.4	B
	Right Turn	2	0	19.0%	0.7	2.1	A
	Subtotal	6	3	50.7%	18.0	20.8	B
Total		2,647	2,590	97.8%	12.9	1.0	B

SimTraffic Post-Processor **Washington Andora Widening**
Average Results from 10 Runs **Existing Plus Project Conditions**
Volume and Delay by Movement **PM Peak Hour**

Intersection 1 **Washington Blvd/Pleasant Grove Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	263	252	95.7%	58.2	15.8	E
	Through	485	496	102.3%	42.0	3.7	D
	Right Turn	484	483	99.8%	9.9	1.0	A
	Subtotal	1,232	1,231	99.9%	32.9	4.9	C
SB	Left Turn	171	136	79.3%	227.6	38.1	F
	Through	856	701	81.9%	219.9	34.6	F
	Right Turn	32	32	98.6%	164.0	31.4	F
	Subtotal	1,059	868	82.0%	219.1	35.2	F
EB	Left Turn	71	68	95.3%	66.3	10.9	E
	Through	1,359	1,301	95.7%	49.7	7.8	D
	Right Turn	209	206	98.5%	39.9	7.6	D
	Subtotal	1,639	1,574	96.1%	49.1	6.9	D
WB	Left Turn	448	444	99.1%	79.4	17.7	E
	Through	1,568	1,535	97.9%	39.6	4.9	D
	Right Turn	57	59	103.3%	17.6	2.4	B
	Subtotal	2,073	2,038	98.3%	47.8	7.5	D
Total		6,003	5,711	95.1%	71.0	7.6	E

Intersection 2 **Washington Blvd/Emerald Oak Rd-Diamond Oaks Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	12	11	95.0%	46.1	15.7	D
	Through	1,077	1,074	99.7%	15.5	2.2	B
	Right Turn	91	107	117.3%	9.1	1.7	A
	Subtotal	1,180	1,192	101.0%	15.2	2.0	B
SB	Left Turn	144	124	86.0%	43.5	6.5	D
	Through	1,355	1,186	87.5%	12.7	1.7	B
	Right Turn	14	12	86.9%	10.8	7.0	B
	Subtotal	1,513	1,322	87.4%	15.6	1.5	B
EB	Left Turn	5	5	98.8%	34.4	26.3	C
	Through	2	2	76.0%	16.1	26.2	B
	Right Turn	9	6	67.6%	12.8	13.8	B
	Subtotal	16	13	78.4%	33.4	19.9	C
WB	Left Turn	82	87	106.1%	37.6	10.1	D
	Through	2	1	38.0%	3.0	9.4	A
	Right Turn	150	158	105.4%	15.2	4.7	B
	Subtotal	234	246	105.1%	23.2	4.5	C
Total		2,943	2,772	94.2%	16.2	1.3	B

Intersection 3 **Washington Blvd/Kaseberg Dr** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	34	30	88.3%	23.7	10.9	C
	Through	1,170	1,165	99.6%	3.1	0.5	A
	Right Turn						
	Subtotal	1,204	1,195	99.3%	3.6	0.5	A
SB	Left Turn						
	Through	1,416	1,248	88.1%	7.4	0.9	A
	Right Turn	30	27	89.9%	6.8	0.9	A
	Subtotal	1,446	1,275	88.1%	7.4	0.9	A
EB	Left Turn	10	13	129.2%	22.2	22.1	C
	Through						
	Right Turn	42	45	107.7%	12.8	3.9	B
	Subtotal	52	58	111.8%	14.8	3.9	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,702	2,528	93.6%	5.8	0.4	A

Intersection 4 **Washington Blvd/Sawtell Rd-Derek Pl** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	50	49	98.8%	43.2	6.7	D
	Through	1,123	1,112	99.0%	6.1	1.6	A
	Right Turn	22	24	107.1%	2.8	1.2	A
	Subtotal	1,195	1,185	99.2%	7.5	1.6	A
SB	Left Turn	17	14	80.5%	49.1	11.6	D
	Through	1,407	1,265	89.9%	12.2	2.0	B
	Right Turn	34	29	83.8%	9.5	5.2	A
	Subtotal	1,458	1,308	89.7%	12.5	2.0	B
EB	Left Turn	62	59	95.0%	33.8	6.3	C
	Through	1	2	152.0%	17.2	24.5	B
	Right Turn	25	18	71.4%	13.3	4.9	B
	Subtotal	88	78	89.0%	29.4	5.1	C
WB	Left Turn	35	25	72.7%	28.3	10.8	C
	Through	3	4	126.7%	30.2	20.0	C
	Right Turn	19	18	94.0%	9.3	5.9	A
	Subtotal	57	47	82.7%	23.8	7.9	C
Total		2,798	2,618	93.6%	10.9	1.6	B

SimTraffic Post-Processor **Washington Andora Widening**
Average Results from 10 Runs **Existing Plus Project Conditions**
Volume and Delay by Movement **PM Peak Hour**

Intersection 5 **Washington Blvd/Junction Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	462	481	104.0%	34.4	2.5	C
	Through	731	725	99.1%	11.2	1.7	B
	Right Turn						
	Subtotal	1,193	1,205	101.0%	20.4	1.8	C
SB	Left Turn	4	3	66.5%	19.9	22.5	B
	Through	920	843	91.6%	25.2	4.7	C
	Right Turn	543	472	86.9%	19.0	3.4	B
	Subtotal	1,467	1,317	89.8%	23.0	3.5	C
EB	Left Turn	461	455	98.8%	30.7	3.9	C
	Through	1	2	190.0%	9.0	17.1	A
	Right Turn	224	219	97.9%	2.1	0.2	A
	Subtotal	686	676	98.6%	21.4	2.6	C
WB	Left Turn	4	5	123.5%	28.1	25.4	C
	Through	4	3	85.5%	33.9	29.5	C
	Right Turn	3	2	76.0%	3.2	4.2	A
	Subtotal	11	11	96.7%	27.0	16.2	C
Total		3,357	3,210	95.6%	21.7	1.6	C

APPENDIX C

CUMULATIVE CONDTIONS

SimTraffic Post-Processor **Washington Andora Widening**
Average Results from 10 Runs **Cumulative No Project Conditions**
Volume and Delay by Movement **AM Peak Hour**

Intersection 1 **Washington Blvd/Pleasant Grove Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	118	116	97.9%	55.7	8.0	E
	Through	850	783	92.1%	43.5	5.9	D
	Right Turn	334	299	89.5%	6.0	1.5	A
	Subtotal	1,302	1,198	92.0%	35.3	4.8	D
SB	Left Turn	94	94	100.3%	79.7	8.7	E
	Through	578	554	95.8%	48.3	3.7	D
	Right Turn	366	377	103.0%	20.9	2.6	C
	Subtotal	1,038	1,025	98.7%	41.1	3.1	D
EB	Left Turn	465	369	79.4%	71.8	7.2	E
	Through	2,138	1,717	80.3%	40.0	3.4	D
	Right Turn	99	77	77.9%	30.1	3.5	C
	Subtotal	2,702	2,163	80.1%	45.1	3.0	D
WB	Left Turn	46	42	90.9%	73.7	12.2	E
	Through	1,039	1,021	98.2%	40.5	3.9	D
	Right Turn	112	116	103.8%	9.2	0.8	A
	Subtotal	1,197	1,179	98.5%	38.6	3.9	D
Total		6,239	5,565	89.2%	40.9	1.9	D

Intersection 2 **Washington Blvd/Emerald Oak Rd-Diamond Oaks Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	5	4	83.6%	74.4	62.6	E
	Through	1,091	974	89.3%	108.4	23.7	F
	Right Turn	66	68	102.5%	101.9	24.0	F
	Subtotal	1,162	1,046	90.0%	108.1	23.5	F
SB	Left Turn	124	101	81.5%	47.7	6.8	D
	Through	598	568	94.9%	13.1	1.4	B
	Right Turn	1	2	228.0%	7.4	9.8	A
	Subtotal	723	671	92.8%	18.6	1.7	B
EB	Left Turn	9	6	67.6%	61.4	41.1	E
	Through	10	7	72.2%	59.9	45.9	E
	Right Turn	15	19	124.1%	25.9	29.4	C
	Subtotal	34	32	93.9%	40.6	35.0	D
WB	Left Turn	36	37	103.4%	43.2	11.2	D
	Through	1	1	76.0%	6.9	15.4	A
	Right Turn	202	206	101.8%	34.1	6.0	C
	Subtotal	239	244	101.9%	35.4	6.1	D
Total		2,158	1,993	92.3%	67.8	12.1	E

Intersection 3 **Washington Blvd/Kaseberg Dr** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	27	29	105.6%	13.0	5.0	B
	Through	1,130	1,120	99.1%	8.9	6.1	A
	Right Turn						
	Subtotal	1,157	1,149	99.3%	9.0	6.0	A
SB	Left Turn						
	Through	643	622	96.8%	6.0	0.9	A
	Right Turn	6	4	69.7%	5.5	0.8	A
	Subtotal	649	627	96.6%	6.0	0.9	A
EB	Left Turn	32	38	117.6%	12.6	2.6	B
	Through						
	Right Turn	23	21	92.5%	5.9	2.4	A
	Subtotal	55	59	107.1%	10.6	2.3	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,861	1,834	98.6%	8.1	3.8	A

Intersection 4 **Washington Blvd/Sawtell Rd-Derek Pl** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	30	33	110.2%	35.1	7.7	D
	Through	1,098	1,099	100.1%	7.4	1.6	A
	Right Turn	62	71	115.2%	3.3	0.7	A
	Subtotal	1,190	1,204	101.2%	7.9	1.5	A
SB	Left Turn	3	2	63.3%	14.6	24.0	B
	Through	641	615	96.0%	7.9	3.3	A
	Right Turn	22	22	101.9%	3.3	3.1	A
	Subtotal	666	640	96.0%	7.9	3.2	A
EB	Left Turn	48	50	103.7%	31.0	6.3	C
	Through	22	22	98.5%	26.2	5.7	C
	Right Turn	84	86	102.2%	9.7	2.3	A
	Subtotal	154	157	102.2%	18.7	2.6	B
WB	Left Turn	16	12	73.6%	28.5	10.7	C
	Through	1	1	76.0%	7.3	16.6	A
	Right Turn	11	11	96.7%	10.6	8.4	B
	Subtotal	28	23	82.8%	22.1	10.2	C
Total		2,038	2,024	99.3%	8.9	1.3	A

SimTraffic Post-Processor **Washington Andora Widening**
Average Results from 10 Runs **Cumulative No Project Conditions**
Volume and Delay by Movement **AM Peak Hour**

Intersection 5 **Washington Blvd/Junction Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	353	347	98.2%	28.0	2.6	C
	Through	797	783	98.3%	10.1	1.6	B
	Right Turn						
	Subtotal	1,150	1,130	98.2%	15.6	1.6	B
SB	Left Turn	3	2	63.3%	17.3	25.2	B
	Through	605	571	94.4%	19.1	3.3	B
	Right Turn	133	142	106.6%	7.6	1.0	A
	Subtotal	741	715	96.5%	17.0	2.9	B
EB	Left Turn	391	407	104.2%	24.8	2.8	C
	Through	1	1	114.0%	2.9	6.2	A
	Right Turn	892	888	99.6%	8.6	1.4	A
	Subtotal	1,284	1,297	101.0%	13.7	1.0	B
WB	Left Turn	2	2	76.0%	17.1	30.0	B
	Through	2	1	38.0%	7.4	18.8	A
	Right Turn	2	2	76.0%	3.7	5.9	A
	Subtotal	6	4	63.3%	23.9	30.0	C
Total		3,181	3,145	98.9%	15.1	1.4	B

Intersection 1 **Washington Blvd/Pleasant Grove Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	224	224	100.1%	58.8	6.3	E
	Through	551	512	92.9%	36.6	3.0	D
	Right Turn	329	326	99.1%	3.5	0.2	A
	Subtotal	1,104	1,062	96.2%	31.4	2.8	C
SB	Left Turn	231	181	78.5%	276.3	42.2	F
	Through	1,062	847	79.8%	227.0	40.1	F
	Right Turn	449	352	78.4%	199.4	37.2	F
	Subtotal	1,742	1,381	79.3%	226.6	39.9	F
EB	Left Turn	209	173	82.5%	101.5	14.2	F
	Through	1,879	1,567	83.4%	71.5	18.4	E
	Right Turn	67	48	70.9%	62.3	22.9	E
	Subtotal	2,155	1,787	82.9%	74.2	17.8	E
WB	Left Turn	354	293	82.8%	179.6	49.0	F
	Through	2,285	2,088	91.4%	94.2	22.3	F
	Right Turn	84	73	86.9%	53.2	21.7	D
	Subtotal	2,723	2,454	90.1%	103.3	24.5	F
Total		7,724	6,684	86.5%	109.5	14.3	F

Intersection 2 **Washington Blvd/Emerald Oak Rd-Diamond Oaks Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	10	10	102.6%	58.9	23.3	E
	Through	769	734	95.5%	47.3	21.4	D
	Right Turn	77	73	95.2%	34.2	23.7	C
	Subtotal	856	818	95.5%	46.4	21.4	D
SB	Left Turn	278	212	76.3%	57.1	6.7	E
	Through	1,188	951	80.1%	24.6	2.6	C
	Right Turn	17	15	89.4%	16.8	6.4	B
	Subtotal	1,483	1,178	79.5%	30.4	3.4	C
EB	Left Turn	5	4	76.0%	68.9	113.2	E
	Through	4	4	104.5%	24.0	30.5	C
	Right Turn	8	8	95.0%	18.1	25.7	B
	Subtotal	17	16	91.6%	32.2	22.6	C
WB	Left Turn	190	184	96.6%	37.0	7.1	D
	Through	8	6	80.8%	41.4	21.2	D
	Right Turn	330	319	96.6%	26.4	4.3	C
	Subtotal	528	509	96.4%	30.4	4.4	C
Total		2,884	2,521	87.4%	35.7	6.7	D

Intersection 3 **Washington Blvd/Kaseberg Dr** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	20	24	121.6%	21.8	9.2	C
	Through	843	828	98.2%	4.2	0.8	A
	Right Turn						
	Subtotal	863	852	98.7%	4.7	1.0	A
SB	Left Turn						
	Through	1,343	1,111	82.7%	11.0	1.0	B
	Right Turn	43	40	92.8%	9.5	0.8	A
	Subtotal	1,386	1,151	83.0%	11.0	1.0	B
EB	Left Turn	13	15	114.0%	36.7	22.9	E
	Through						
	Right Turn	38	35	91.0%	27.1	13.1	D
	Subtotal	51	49	96.9%	29.4	11.9	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,300	2,052	89.2%	8.9	0.8	A

Intersection 4 **Washington Blvd/Sawtell Rd-Derek Pl** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	50	54	107.2%	40.6	14.9	D
	Through	792	788	99.5%	5.5	1.1	A
	Right Turn	25	25	101.8%	2.9	0.7	A
	Subtotal	867	867	100.0%	7.7	1.4	A
SB	Left Turn	15	11	76.0%	44.4	24.0	D
	Through	1,331	1,099	82.5%	7.9	1.3	A
	Right Turn	35	26	74.9%	4.3	3.1	A
	Subtotal	1,381	1,136	82.3%	8.3	1.3	A
EB	Left Turn	62	59	95.6%	38.4	7.3	D
	Through	1	0	38.0%	3.8	12.0	A
	Right Turn	25	20	80.6%	14.6	7.6	B
	Subtotal	88	80	90.7%	32.1	7.0	C
WB	Left Turn	50	46	91.2%	37.2	10.4	D
	Through	3	3	114.0%	36.7	32.4	D
	Right Turn	9	11	118.2%	13.3	7.6	B
	Subtotal	62	60	96.2%	34.6	9.8	C
Total		2,398	2,142	89.3%	9.7	1.4	A

SimTraffic Post-Processor **Washington Andora Widening**
Average Results from 10 Runs **Cumulative No Project Conditions**
Volume and Delay by Movement **PM Peak Hour**

Intersection 5 **Washington Blvd/Junction Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	1,193	1,118	93.7%	58.8	24.4	E
	Through	581	565	97.2%	27.5	18.5	C
	Right Turn						
	Subtotal	1,774	1,682	94.8%	48.4	22.7	D
SB	Left Turn	4	2	38.0%	19.2	24.9	B
	Through	967	796	82.4%	52.9	13.9	D
	Right Turn	435	366	84.0%	35.5	10.7	D
	Subtotal	1,406	1,164	82.8%	47.5	12.5	D
EB	Left Turn	283	297	104.9%	34.6	3.0	C
	Through	1	1	114.0%	2.8	5.9	A
	Right Turn	525	526	100.2%	4.0	0.7	A
	Subtotal	809	824	101.9%	15.0	1.3	B
WB	Left Turn	4	2	57.0%	26.0	32.4	C
	Through	4	4	104.5%	46.1	36.2	D
	Right Turn	3	3	114.0%	1.9	2.4	A
	Subtotal	11	10	89.8%	32.9	23.9	C
Total		4,000	3,680	92.0%	40.6	10.1	D

SimTraffic Post-Processor **Washington Andora Widening**
Average Results from 10 Runs **Cumulative Plus Project Conditions**
Volume and Delay by Movement **AM Peak Hour**

Intersection 1 **Washington Blvd/Pleasant Grove Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	167	171	102.4%	70.2	17.7	E
	Through	1,043	1,006	96.5%	62.3	18.9	E
	Right Turn	458	501	109.4%	30.3	12.8	C
	Subtotal	1,668	1,678	100.6%	53.6	17.3	D
SB	Left Turn	90	72	80.2%	79.0	19.8	E
	Through	568	570	100.4%	46.0	4.0	D
	Right Turn	386	367	95.2%	20.9	2.6	C
	Subtotal	1,044	1,010	96.7%	39.3	4.4	D
EB	Left Turn	382	302	79.2%	88.8	11.3	F
	Through	2,110	1,734	82.2%	58.9	10.5	E
	Right Turn	100	85	84.7%	43.8	9.4	D
	Subtotal	2,592	2,122	81.8%	62.6	10.4	E
WB	Left Turn	43	41	94.6%	76.5	13.8	E
	Through	1,049	1,072	102.2%	45.4	2.7	D
	Right Turn	112	114	102.1%	9.6	1.4	A
	Subtotal	1,204	1,227	101.9%	43.0	2.4	D
Total		6,508	6,036	92.8%	52.0	5.3	D

Intersection 2 **Washington Blvd/Emerald Oak Rd-Diamond Oaks Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	6	5	76.0%	29.8	16.8	C
	Through	1,461	1,459	99.9%	23.4	7.1	C
	Right Turn	118	131	110.8%	15.5	4.1	B
	Subtotal	1,585	1,594	100.6%	22.8	6.8	C
SB	Left Turn	123	128	103.8%	64.2	16.5	E
	Through	587	543	92.4%	10.8	2.3	B
	Right Turn	1	2	152.0%	4.8	7.3	A
	Subtotal	711	672	94.5%	21.1	3.6	C
EB	Left Turn	9	12	130.9%	24.5	9.9	C
	Through	11	9	79.5%	29.6	15.0	C
	Right Turn	14	17	124.9%	14.7	12.5	B
	Subtotal	34	38	111.8%	19.9	5.1	B
WB	Left Turn	36	39	108.7%	26.8	15.7	C
	Through	1	1	114.0%	9.3	19.9	A
	Right Turn	198	185	93.7%	19.0	2.8	B
	Subtotal	235	226	96.1%	20.6	2.4	C
Total		2,565	2,530	98.6%	22.1	5.1	C

SimTraffic Post-Processor **Washington Andora Widening**
Average Results from 10 Runs **Cumulative Plus Project Conditions**
Volume and Delay by Movement **AM Peak Hour**

Intersection 3 **Washington Blvd/Kaseberg Dr** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	28	28	99.1%	4.6	2.2	A
	Through	1,552	1,551	99.9%	4.1	1.1	A
	Right Turn						
	Subtotal	1,580	1,579	99.9%	4.1	1.1	A
SB	Left Turn						
	Through	631	591	93.6%	3.8	0.7	A
	Right Turn	6	3	44.3%	3.5	0.7	A
	Subtotal	637	593	93.1%	3.8	0.7	A
EB	Left Turn	33	22	67.9%	10.5	9.5	B
	Through						
	Right Turn	23	24	104.1%	4.1	2.4	A
	Subtotal	56	46	82.8%	7.4	3.9	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,273	2,218	97.6%	4.1	0.9	A

Intersection 4 **Washington Blvd/Sawtell Rd-Derek Pl** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	30	27	88.7%	42.8	14.7	D
	Through	1,519	1,524	100.3%	9.4	1.9	A
	Right Turn	62	63	101.1%	5.9	1.4	A
	Subtotal	1,611	1,613	100.1%	9.9	1.8	A
SB	Left Turn	4	3	66.5%	32.0	31.9	C
	Through	628	587	93.4%	15.1	9.2	B
	Right Turn	22	21	93.3%	9.9	7.9	A
	Subtotal	654	610	93.3%	15.1	8.9	B
EB	Left Turn	49	54	110.9%	37.8	7.9	D
	Through	22	29	131.3%	34.6	9.2	C
	Right Turn	84	104	123.5%	8.5	2.2	A
	Subtotal	155	187	120.6%	21.1	4.7	C
WB	Left Turn	15	13	88.7%	34.4	11.1	C
	Through	1	0	0.0%	0.1	0.3	A
	Right Turn	12	17	145.7%	14.3	7.4	B
	Subtotal	28	31	109.9%	21.8	5.1	C
Total		2,448	2,441	99.7%	12.1	2.9	B

SimTraffic Post-Processor **Washington Andora Widening**
Average Results from 10 Runs **Cumulative Plus Project Conditions**
Volume and Delay by Movement **AM Peak Hour**

Intersection 5 **Washington Blvd/Junction Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	298	297	99.6%	39.7	7.1	D
	Through	957	976	102.0%	17.6	2.8	B
	Right Turn						
	Subtotal	1,255	1,273	101.4%	22.7	3.3	C
SB	Left Turn	3	3	88.7%	34.1	29.3	C
	Through	599	565	94.3%	24.1	3.0	C
	Right Turn	125	121	96.7%	9.3	1.8	A
	Subtotal	727	689	94.7%	21.6	2.7	C
EB	Left Turn	652	660	101.3%	27.6	4.7	C
	Through	1	0	38.0%	6.4	20.3	A
	Right Turn	795	830	104.4%	7.6	1.1	A
	Subtotal	1,448	1,491	103.0%	16.5	2.4	B
WB	Left Turn	2	4	209.0%	11.4	13.4	B
	Through	2	2	76.0%	10.2	20.3	B
	Right Turn	2	4	190.0%	5.5	4.3	A
	Subtotal	6	10	158.3%	15.2	13.2	B
Total		3,436	3,461	100.7%	19.8	1.3	B

SimTraffic Post-Processor **Washington Andora Widening**
Average Results from 10 Runs **Cumulative Plus Project Conditions**
Volume and Delay by Movement **PM Peak Hour**

Intersection 1 **Washington Blvd/Pleasant Grove Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	254	261	102.9%	75.8	15.4	E
	Through	623	613	98.3%	37.7	3.8	D
	Right Turn	328	320	97.5%	9.1	0.7	A
	Subtotal	1,205	1,194	99.1%	38.6	4.3	D
SB	Left Turn	226	152	67.1%	361.6	31.4	F
	Through	1,354	954	70.4%	307.8	33.8	F
	Right Turn	350	253	72.2%	278.2	32.7	F
	Subtotal	1,930	1,358	70.4%	308.3	33.1	F
EB	Left Turn	205	159	77.7%	173.1	34.6	F
	Through	1,905	1,450	76.1%	153.4	34.0	F
	Right Turn	112	84	75.0%	153.2	39.3	F
	Subtotal	2,222	1,693	76.2%	155.2	34.1	F
WB	Left Turn	511	363	70.9%	248.9	22.1	F
	Through	2,239	2,010	89.8%	135.6	18.4	F
	Right Turn	84	69	82.3%	96.1	17.1	F
	Subtotal	2,834	2,442	86.2%	151.3	18.3	F
Total		8,191	6,686	81.6%	164.1	14.6	F

Intersection 2 **Washington Blvd/Emerald Oak Rd-Diamond Oaks Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	9	11	118.2%	37.4	9.7	D
	Through	871	861	98.9%	19.4	3.2	B
	Right Turn	83	87	105.3%	9.4	2.4	A
	Subtotal	963	959	99.6%	18.7	3.0	B
SB	Left Turn	205	143	69.7%	41.0	4.5	D
	Through	1,756	1,244	70.8%	22.9	4.2	C
	Right Turn	16	14	85.5%	18.6	4.3	B
	Subtotal	1,977	1,400	70.8%	24.7	4.0	C
EB	Left Turn	5	4	76.0%	22.2	23.4	C
	Through	3	2	76.0%	8.3	14.2	A
	Right Turn	9	10	109.8%	13.8	6.0	B
	Subtotal	17	16	93.9%	19.3	8.5	B
WB	Left Turn	251	240	95.7%	23.8	2.1	C
	Through	7	6	86.9%	20.2	16.7	C
	Right Turn	329	348	105.7%	14.6	1.8	B
	Subtotal	587	594	101.2%	18.5	0.9	B
Total		3,544	2,969	83.8%	21.5	2.3	C

SimTraffic Post-Processor **Washington Andora Widening**
Average Results from 10 Runs **Cumulative Plus Project Conditions**
Volume and Delay by Movement **PM Peak Hour**

Intersection 3 **Washington Blvd/Kaseberg Dr** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	18	18	99.2%	19.1	14.1	C
	Through	950	934	98.3%	1.8	0.2	A
	Right Turn						
	Subtotal	968	952	98.3%	2.2	0.4	A
SB	Left Turn						
	Through	1,971	1,471	74.7%	9.0	1.1	A
	Right Turn	45	33	72.6%	8.4	1.1	A
	Subtotal	2,016	1,504	74.6%	9.0	1.1	A
EB	Left Turn	13	13	96.5%	33.0	19.8	D
	Through						
	Right Turn	38	28	74.0%	12.7	5.2	B
	Subtotal	51	41	79.7%	20.0	8.5	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,035	2,496	82.2%	6.6	0.8	A

Intersection 4 **Washington Blvd/Sawtell Rd-Derek Pl** **Signal**

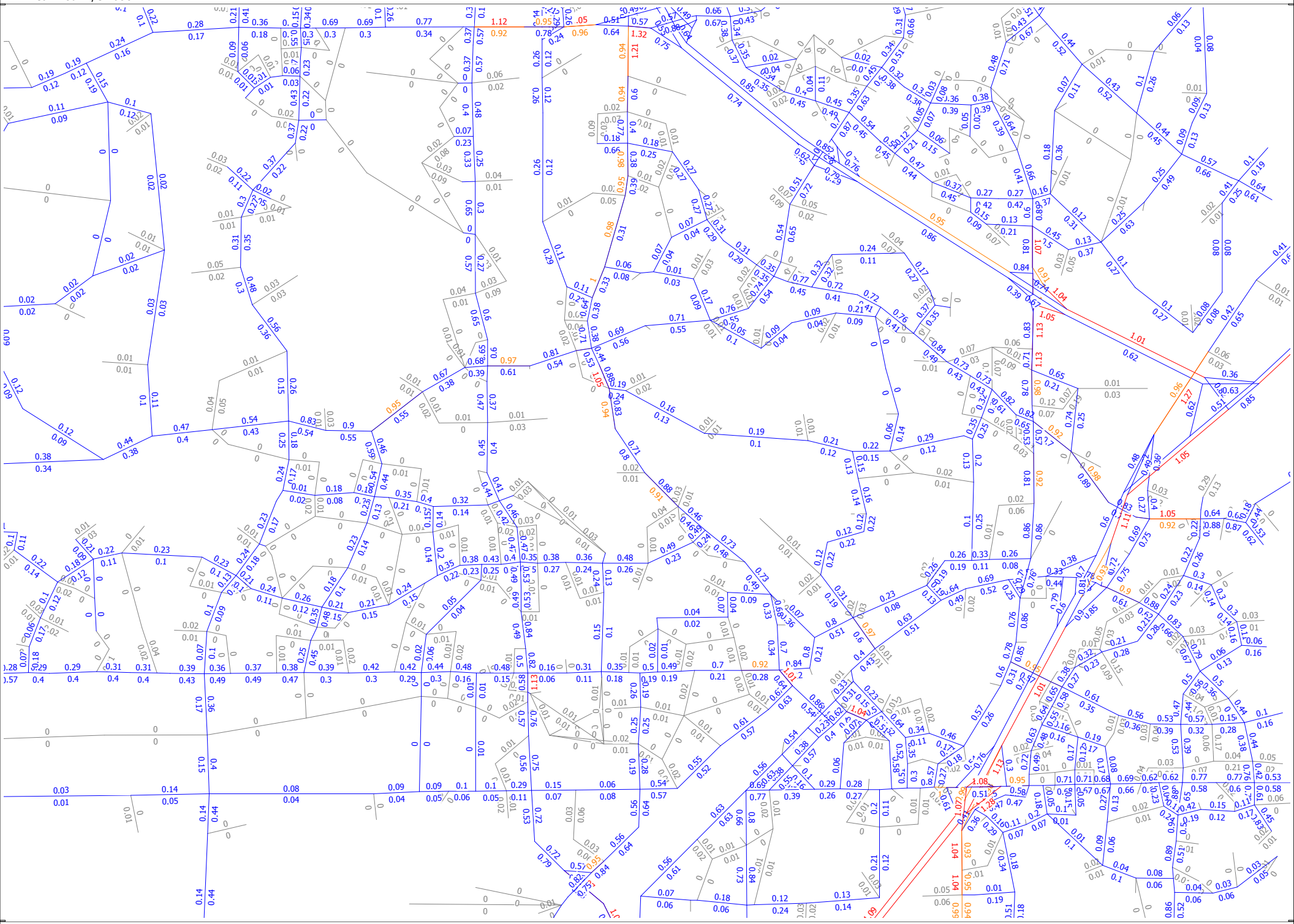
Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	53	46	86.0%	57.9	14.3	E
	Through	894	869	97.2%	5.3	0.7	A
	Right Turn	21	24	112.2%	2.2	0.8	A
	Subtotal	968	938	96.9%	7.8	1.7	A
SB	Left Turn	20	14	68.4%	63.8	22.4	E
	Through	1,952	1,406	72.0%	18.1	5.2	B
	Right Turn	37	29	79.1%	18.3	9.3	B
	Subtotal	2,009	1,449	72.1%	18.6	5.1	B
EB	Left Turn	63	66	105.0%	45.2	7.2	D
	Through	1	1	76.0%	8.5	26.7	A
	Right Turn	25	24	97.3%	26.5	7.9	C
	Subtotal	89	91	102.5%	40.1	6.2	D
WB	Left Turn	48	41	84.7%	53.0	13.1	D
	Through	3	2	63.3%	19.6	29.8	B
	Right Turn	11	14	124.4%	5.9	3.4	A
	Subtotal	62	56	90.7%	41.9	13.8	D
Total		3,128	2,534	81.0%	15.9	3.3	B

SimTraffic Post-Processor **Washington Andora Widening**
Average Results from 10 Runs **Cumulative Plus Project Conditions**
Volume and Delay by Movement **PM Peak Hour**

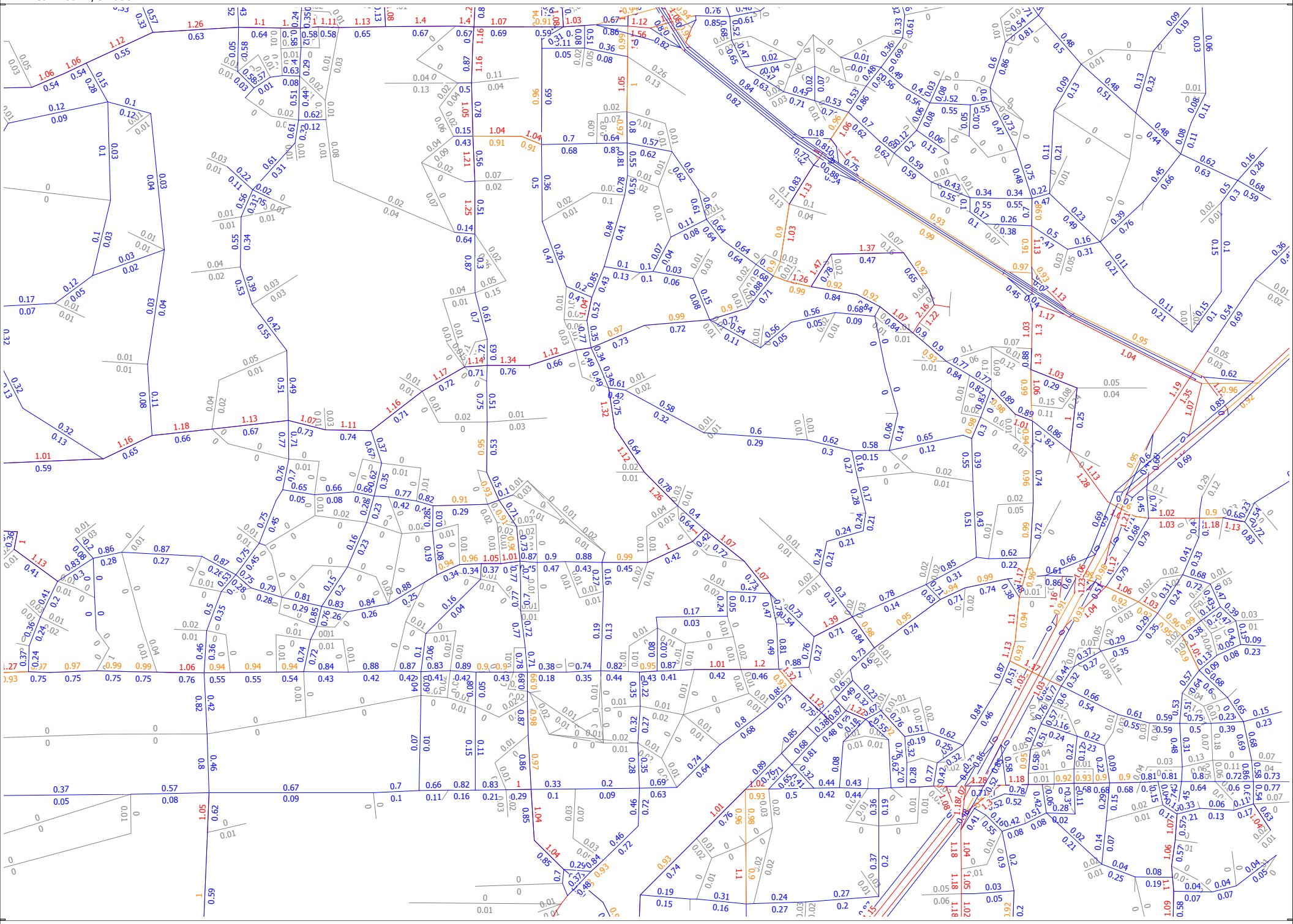
Intersection 5 **Washington Blvd/Junction Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	1,005	941	93.6%	62.2	18.8	E
	Through	685	676	98.6%	23.1	11.1	C
	Right Turn						
	Subtotal	1,690	1,616	95.6%	45.9	16.0	D
SB	Left Turn	4	4	95.0%	44.7	37.2	D
	Through	1,239	977	78.8%	42.8	5.9	D
	Right Turn	782	583	74.5%	61.1	16.1	E
	Subtotal	2,025	1,563	77.2%	49.8	8.3	D
EB	Left Turn	280	275	98.1%	46.0	4.3	D
	Through	1	0	38.0%	2.0	6.3	A
	Right Turn	438	446	101.8%	3.2	0.5	A
	Subtotal	719	721	100.3%	19.5	1.7	B
WB	Left Turn	4	2	47.5%	12.5	18.6	B
	Through	4	5	123.5%	45.2	36.5	D
	Right Turn	3	5	152.0%	10.1	9.4	B
	Subtotal	11	11	103.6%	33.5	18.3	C
Total		4,445	3,911	88.0%	42.6	7.7	D

Roseville Washington Andora Widening
Base Year
PM Peak Hour V/C Ratio

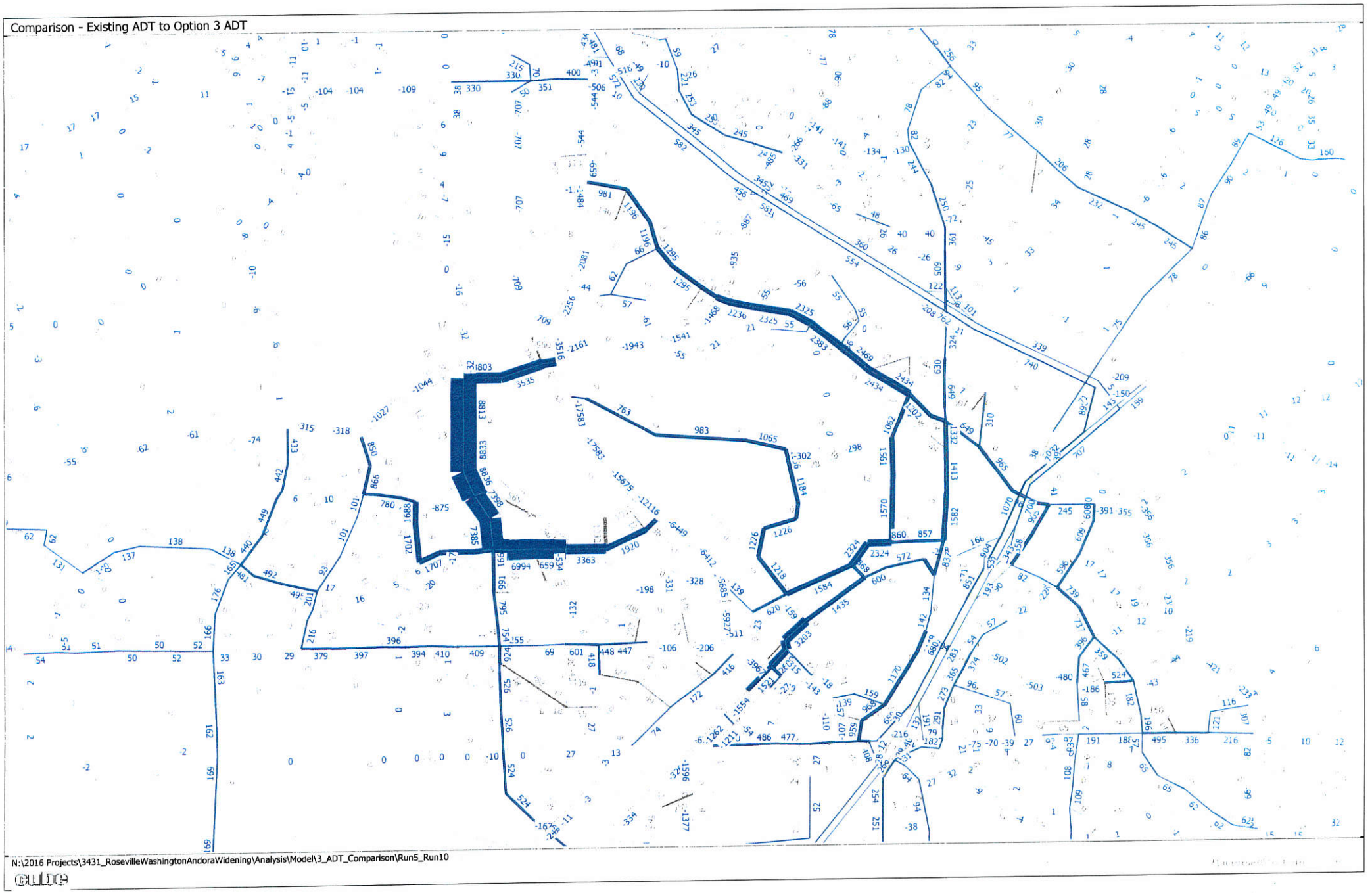


Roseville Washington Andora Widening
Cumulative Year No Project
PM Peak Hour V/C Ratio



APPENDIX D

CONSTRUCTION CLOSURE CONDITIONS


Comparison - Existing ADT to Option 3 ADT
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Option 3 Traffic Diversion - Roadways Experiencing Increases

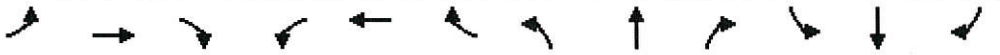
Segment	Functional Class	Existing ADT	Existing Plus Option 3 - Method A	Existing Plus Option 3 - Method B	Method B Divided by Method A
Washington Blvd south of Pleasant Grove	Two to Four Lanes	22,100	5,900	6,200	5.1%
Washington Blvd. south of Diamond Oaks Rd.	Two Lanes	20,300	0	0	-
Foothills south of Pleasant Grove	Six-Lane Arterial	32,200	42,600	43,400	1.9%
Pleasant Grove west of Washington	Six-Lane Arterial	44,100	48,300	47,100	-2.5%
Junction east of Foothills	Four-Lane Arterial	14,400	22,600	22,500	-0.4%
Diamond Oaks east of Washington	Two-Lane Collector	4,700	5,900	6,200	5.1%
Roseville Parkway east of Pleasant Grove	Six-Lane Arterial	44,800	47,500	51,900	9.3%
Galleria south of Roseville Parkway	Six-Lane Arterial	27,900	29,800	32,000	7.4%
Reserve Drive south of Roseville Parkway	Two-Lane Collector	8,000	9,800	11,000	12.2%
SUM or Average		*218,500*	*212,400*	*220300*	*4.8%*
Source / Note		*1, 2*	*3*	*4*	

1 = ADT based on March 2015 traffic data compiled from City's ITS count database as part of Placer Ranch SP EIR.

2 = ADT on Washington Blvd. based on May 2016 counts. Counts not available on Reserve Drive, so very rough estimate of 8,000 ADT assumed.

3 = Method A is the base year model's predicted redistribution of traffic (based on percent increase)

4 = Method B is the projected redistribution based on travel time survey results.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	163	207	91	198	384	189	148	1148	158	204	1204	180
Future Volume (veh/h)	163	207	91	198	384	189	148	1148	158	204	1204	180
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	181	230	8	220	427	19	164	1276	0	227	1338	0
Adj No. of Lanes	1	2	1	1	2	1	1	3	1	1	3	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	223	511	224	262	588	258	206	2334	700	269	2514	756
Arrive On Green	0.13	0.14	0.14	0.15	0.17	0.17	0.12	0.46	0.00	0.15	0.49	0.00
Sat Flow, veh/h	1774	3539	1550	1774	3539	1555	1774	5085	1583	1774	5085	1583
Grp Volume(v), veh/h	181	230	8	220	427	19	164	1276	0	227	1338	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1550	1774	1770	1555	1774	1695	1583	1774	1695	1583
Q Serve(g_s), s	11.9	7.1	0.5	14.5	13.7	1.2	10.8	21.7	0.0	14.9	21.7	0.0
Cycle Q Clear(g_c), s	11.9	7.1	0.5	14.5	13.7	1.2	10.8	21.7	0.0	14.9	21.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	223	511	224	262	588	258	206	2334	700	269	2514	756
V/C Ratio(X)	0.81	0.45	0.04	0.84	0.73	0.07	0.80	0.55	0.00	0.84	0.53	0.00
Avail Cap(c_a), veh/h	340	599	262	355	628	276	355	2334	700	384	2514	756
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	51.1	47.0	44.1	49.8	47.4	42.2	51.6	23.4	0.0	49.5	20.8	0.0
Incr Delay (d2), s/veh	4.6	0.8	0.1	9.7	4.2	0.1	2.6	0.9	0.0	8.0	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	3.5	0.2	7.8	7.0	0.5	5.4	10.4	0.0	7.9	10.3	0.0
LnGrp Delay(d),s/veh	55.7	47.7	44.2	59.4	51.6	42.4	54.3	24.4	0.0	57.5	21.6	0.0
LnGrp LOS	E	D	D	E	D	D	D	C		E	C	
Approach Vol, veh/h		419			666			1440			1565	
Approach Delay, s/veh		51.1			53.9			27.8			26.8	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.9	62.3	18.1	22.6	21.2	58.1	20.7	20.0
Change Period (Y+Rc), s	4.0	6.0	4.0	5.7	4.0	* 6	4.0	5.7
Max Green Setting (Gmax), s	23.0	37.0	22.0	18.3	25.0	* 35	23.0	17.3
Max Q Clear Time (g_c+I1), s	12.8	23.7	13.9	15.7	16.9	23.7	16.5	9.1
Green Ext Time (p_c), s	0.2	11.9	0.2	1.0	0.3	10.4	0.2	2.4

Intersection Summary	
HCM 2010 Ctrl Delay	34.1
HCM 2010 LOS	C

Notes

SimTraffic Post-Processor **Washington Blvd Widening**
Average Results from 10 Runs **Existing Conditions**
Volume and Delay by Movement **PM Peak Hour**

Intersection 58 **Foothills Blvd/Pleasant Grove Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	328	340	103.7%	53.3	4.2	D
	Through	411	420	102.1%	39.7	4.3	D
	Right Turn	572	554	96.9%	3.9	0.2	A
	Subtotal	1,311	1,314	100.2%	28.2	2.2	C
SB	Left Turn	265	242	91.4%	47.7	7.5	D
	Through	707	720	101.8%	49.7	6.1	D
	Right Turn	173	181	104.9%	3.0	0.4	A
	Subtotal	1,145	1,143	99.9%	41.8	4.6	D
EB	Left Turn	134	120	89.7%	49.2	8.3	D
	Through	1,058	987	93.3%	37.4	3.0	D
	Right Turn	161	154	95.9%	4.3	0.6	A
	Subtotal	1,353	1,261	93.2%	34.6	2.6	C
WB	Left Turn	788	777	98.6%	70.7	8.0	E
	Through	1,380	1,182	85.7%	102.2	35.7	F
	Right Turn	107	86	80.1%	55.7	27.6	E
	Subtotal	2,275	2,045	89.9%	88.1	22.8	F
Total		6,084	5,764	94.7%	53.6	7.4	D

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

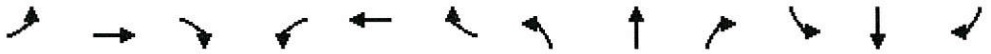
Washington Blvd Widening
Existing Conditions
PM Peak Hour

Intersection 63 **Galleria Blvd/Roseville Pkwy** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	514	452	87.9%	97.3	32.7	F
	Through	756	723	95.7%	51.1	7.5	D
	Right Turn	65	62	94.9%	8.3	4.6	A
	Subtotal	1,335	1,237	92.6%	66.0	15.7	E
SB	Left Turn	585	583	99.6%	75.1	7.8	E
	Through	582	556	95.5%	46.1	9.4	D
	Right Turn	309	308	99.7%	3.5	0.3	A
	Subtotal	1,476	1,446	98.0%	48.7	5.2	D
EB	Left Turn	446	412	92.3%	101.8	43.8	F
	Through	1,101	1,126	102.3%	40.5	6.7	D
	Right Turn	448	460	102.6%	7.3	1.1	A
	Subtotal	1,995	1,998	100.1%	45.8	9.3	D
WB	Left Turn	247	220	89.2%	93.1	21.5	F
	Through	1,405	1,328	94.5%	96.6	25.3	F
	Right Turn	745	721	96.8%	15.6	9.8	B
	Subtotal	2,397	2,270	94.7%	70.7	20.3	E
Total		7,203	6,950	96.5%	58.0	8.1	E

Intersection 107 **Reserve Dr/Roseville Pkwy** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	306	300	98.2%	42.1	7.0	D
	Through	28	29	104.7%	41.9	13.8	D
	Right Turn	274	259	94.7%	9.2	2.5	A
	Subtotal	608	589	96.9%	27.7	4.1	C
SB	Left Turn	165	161	97.5%	39.5	3.1	D
	Through	23	20	88.3%	41.8	13.1	D
	Right Turn	74	73	98.6%	1.1	0.1	A
	Subtotal	262	254	97.0%	28.6	3.0	C
EB	Left Turn	38	42	109.8%	46.3	12.1	D
	Through	1,512	1,544	102.1%	36.6	3.8	D
	Right Turn	271	265	97.8%	8.3	3.4	A
	Subtotal	1,821	1,851	101.7%	32.8	3.8	C
WB	Left Turn	201	174	86.4%	55.3	10.0	E
	Through	1,840	1,714	93.1%	35.5	7.7	D
	Right Turn	187	162	86.9%	8.3	0.5	A
	Subtotal	2,228	2,050	92.0%	35.1	7.4	D
Total		4,919	4,744	96.4%	33.0	3.6	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	203	167	91	98	354	659	148	1238	68	737	1279	210
Future Volume (vph)	203	167	91	98	354	659	148	1238	68	737	1279	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	2.7	2.7	3.0	2.7	2.7	3.0	2.7	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1532	1770	3539	1534	1770	5085	1560	1770	5085	1560
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1532	1770	3539	1534	1770	5085	1560	1770	5085	1560
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	226	186	101	109	393	732	164	1376	76	819	1421	233
RTOR Reduction (vph)	0	0	75	0	0	301	0	0	0	0	0	0
Lane Group Flow (vph)	226	186	26	109	393	431	164	1376	76	819	1421	233
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8			4			Free			Free
Actuated Green, G (s)	18.6	28.1	28.1	12.2	21.7	21.7	15.4	35.3	120.0	25.0	44.6	120.0
Effective Green, g (s)	19.6	31.1	31.1	13.2	24.7	24.7	16.4	38.3	120.0	26.0	47.6	120.0
Actuated g/C Ratio	0.16	0.26	0.26	0.11	0.21	0.21	0.14	0.32	1.00	0.22	0.40	1.00
Clearance Time (s)	4.0	5.7	5.7	4.0	5.7	5.7	4.0	5.7		4.0	6.0	
Vehicle Extension (s)	2.0	3.6	3.6	2.0	3.6	3.6	2.0	4.5		2.0	4.1	
Lane Grp Cap (vph)	289	917	397	194	728	315	241	1622	1560	383	2017	1560
v/s Ratio Prot	c0.13	0.05		0.06	0.11		0.09	c0.27		c0.46	0.28	
v/s Ratio Perm			0.02			c0.28			0.05			0.15
v/c Ratio	0.78	0.20	0.07	0.56	0.54	1.37	0.68	0.85	0.05	2.14	0.70	0.15
Uniform Delay, d1	48.2	34.8	33.5	50.7	42.6	47.6	49.3	38.1	0.0	47.0	30.3	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.0	0.1	0.1	2.2	0.9	184.8	6.2	5.7	0.1	521.0	2.1	0.2
Delay (s)	60.1	34.9	33.6	52.9	43.5	232.4	55.5	43.9	0.1	568.0	32.4	0.2
Level of Service	E	C	C	D	D	F	E	D	A	F	C	A
Approach Delay (s)		45.7			156.4			43.0			206.7	
Approach LOS		D			F			D			F	

Intersection Summary			
HCM 2000 Control Delay	136.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.27		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	100.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

SimTraffic Post-Processor | **Washington Blvd Widening**
Average Results from 10 Runs | **Option 3**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 58 **Foothills Blvd/Pleasant Grove Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	493	490	99.4%	101.5	24.4	F
	Through	476	513	107.8%	44.3	5.8	D
	Right Turn	942	906	96.2%	7.4	0.8	A
	Subtotal	1,911	1,909	99.9%	41.5	7.8	D
SB	Left Turn	165	167	101.0%	52.8	7.4	D
	Through	807	823	102.0%	75.3	17.6	E
	Right Turn	173	166	96.1%	3.2	0.4	A
	Subtotal	1,145	1,156	101.0%	61.6	12.4	E
EB	Left Turn	134	140	104.2%	50.2	6.3	D
	Through	891	838	94.1%	35.0	2.7	D
	Right Turn	328	320	97.6%	4.2	0.5	A
	Subtotal	1,353	1,298	95.9%	29.2	2.5	C
WB	Left Turn	1,215	890	73.3%	208.2	31.0	F
	Through	1,215	1,069	88.0%	62.9	7.9	E
	Right Turn	42	31	73.7%	19.6	4.3	B
	Subtotal	2,472	1,990	80.5%	127.4	16.8	F
Total		6,881	6,354	92.3%	69.6	5.6	E

SimTraffic Post-Processor | **Washington Blvd Widening**
Average Results from 10 Runs | **Option 3**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 63 **Galleria Blvd/Roseville Pkwy** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	699	458	65.5%	301.0	39.6	F
	Through	756	706	93.4%	142.7	36.5	F
	Right Turn	65	65	100.1%	95.5	36.3	F
	Subtotal	1,520	1,228	80.8%	199.3	37.2	F
SB	Left Turn	585	581	99.3%	87.0	26.9	F
	Through	582	567	97.4%	47.3	6.7	D
	Right Turn	309	315	102.1%	3.8	0.6	A
	Subtotal	1,476	1,463	99.1%	53.9	12.4	D
EB	Left Turn	446	415	93.1%	83.8	22.1	F
	Through	1,101	1,085	98.6%	38.6	9.4	D
	Right Turn	662	603	91.2%	8.1	0.7	A
	Subtotal	2,209	2,104	95.2%	38.9	7.1	D
WB	Left Turn	247	237	96.1%	105.4	18.8	F
	Through	1,405	1,371	97.6%	115.3	27.4	F
	Right Turn	745	688	92.4%	25.6	15.4	C
	Subtotal	2,397	2,297	95.8%	87.6	23.5	F
Total		7,602	7,092	93.3%	85.4	7.1	F

Intersection 107 **Reserve Dr/Roseville Pkwy** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	446	438	98.1%	61.1	19.6	E
	Through	28	23	83.3%	72.8	26.4	E
	Right Turn	274	257	93.7%	12.4	3.0	B
	Subtotal	748	718	96.0%	43.9	11.6	D
SB	Left Turn	165	170	103.2%	44.7	7.2	D
	Through	23	28	122.6%	37.1	10.8	D
	Right Turn	74	79	106.7%	1.2	0.2	A
	Subtotal	262	277	105.9%	31.6	5.3	C
EB	Left Turn	38	39	101.9%	70.6	16.3	E
	Through	1,726	1,692	98.1%	65.9	10.0	E
	Right Turn	431	408	94.6%	57.5	23.7	E
	Subtotal	2,195	2,139	97.4%	64.4	12.1	E
WB	Left Turn	201	166	82.5%	67.4	14.5	E
	Through	2,025	1,763	87.0%	41.9	16.6	D
	Right Turn	187	155	83.0%	9.8	3.8	A
	Subtotal	2,413	2,084	86.4%	41.5	14.7	D
Total		5,618	5,218	92.9%	50.8	9.0	D

SimTraffic Post-Processor **Washington Andora Widening**
Average Results from 10 Runs **Option 4 Closure Conditions**
Volume and Delay by Movement **PM Peak Hour**

Intersection 1 **Washington Blvd/Pleasant Grove Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	139	91	65.6%	47.5	5.5	D
	Through	207	149	71.8%	32.9	7.5	C
	Right Turn	212	144	68.1%	2.2	0.1	A
	Subtotal	558	384	68.8%	24.6	3.9	C
SB	Left Turn	172	90	52.6%	257.8	90.4	F
	Through	340	119	35.1%	490.9	162.1	F
	Right Turn	227	130	57.3%	218.0	85.8	F
	Subtotal	739	340	46.0%	323.5	111.9	F
EB	Left Turn	165	153	92.6%	65.3	8.9	E
	Through	1,464	1,375	93.9%	47.1	10.4	D
	Right Turn	110	89	81.2%	142.8	88.9	F
	Subtotal	1,739	1,617	93.0%	54.1	13.0	D
WB	Left Turn	189	106	56.3%	236.6	113.8	F
	Through	1,628	1,518	93.3%	39.6	7.2	D
	Right Turn	58	59	101.6%	17.7	4.8	B
	Subtotal	1,875	1,684	89.8%	49.1	9.3	D
Total		4,911	4,025	82.0%	70.0	13.0	E

Intersection 2 **Washington Blvd/Emerald Oak Rd-Diamond Oaks Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	7	2	27.1%	2.5	3.1	A
	Through	405	247	61.0%	4.8	0.5	A
	Right Turn	50	32	63.1%	3.9	1.0	A
	Subtotal	462	280	60.7%	4.7	0.5	A
SB	Left Turn	144	52	35.9%	203.1	40.8	F
	Through	481	239	49.8%	224.3	18.1	F
	Right Turn	14	6	43.4%	108.8	88.0	F
	Subtotal	639	297	46.5%	221.3	14.0	F
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through						
	Right Turn	154	152	98.5%	6.3	1.0	A
	Subtotal	154	152	98.5%	6.3	1.0	A
Total		1,255	729	58.1%	93.0	5.3	F

SimTraffic Post-Processor **Washington Andora Widening**
Average Results from 10 Runs **Option 4 Closure Conditions**
Volume and Delay by Movement **PM Peak Hour**

Intersection 3 **Washington Blvd/Kaseberg Dr** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	35	22	64.1%	135.8	36.5	F
	Through	452	263	58.2%	220.0	41.1	F
	Right Turn						
	Subtotal	487	285	58.6%	214.0	39.5	F
SB	Left Turn						
	Through	451	222	49.3%	3.9	0.6	A
	Right Turn	30	13	44.3%	2.2	0.8	A
	Subtotal	481	236	49.0%	3.8	0.6	A
EB	Left Turn	10	7	72.2%	249.6	168.6	F
	Through						
	Right Turn	42	35	83.2%	76.6	105.8	F
	Subtotal	52	42	81.1%	99.3	110.3	F
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,020	563	55.2%	115.7	21.3	F

Intersection 4 **Washington Blvd/Sawtell Rd-Derek Pl** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	50	50	100.3%	20.4	8.2	C
	Through	444	383	86.4%	27.2	25.1	C
	Right Turn	22	23	105.4%	6.0	12.0	A
	Subtotal	516	457	88.5%	25.5	23.2	C
SB	Left Turn	9	5	50.7%	17.5	16.1	B
	Through	466	244	52.3%	6.3	4.1	A
	Right Turn	18	12	65.4%	4.2	5.9	A
	Subtotal	493	260	52.7%	6.5	4.0	A
EB	Left Turn	34	31	90.5%	26.2	14.4	C
	Through	1	0	0.0%	1.0	3.3	A
	Right Turn	25	18	71.4%	4.0	1.3	A
	Subtotal	60	49	81.1%	18.2	9.8	B
WB	Left Turn	37	24	63.7%	13.3	6.1	B
	Through	3	3	101.3%	7.2	7.4	A
	Right Turn	9	8	88.7%	22.1	23.1	C
	Subtotal	49	35	70.6%	14.9	7.2	B
Total		1,118	800	71.5%	18.4	14.9	B

SimTraffic Post-Processor **Washington Andora Widening**
Average Results from 10 Runs **Option 4 Closure Conditions**
Volume and Delay by Movement **PM Peak Hour**

Intersection 5 **Washington Blvd/Junction Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	508	498	98.1%	15.9	2.4	B
	Through	374	368	98.5%	6.2	1.3	A
	Right Turn						
	Subtotal	882	866	98.2%	11.8	1.6	B
SB	Left Turn	2	0	0.0%	0.8	2.4	A
	Through	396	229	57.8%	16.4	4.5	B
	Right Turn	130	72	55.2%	6.6	1.6	A
	Subtotal	528	301	56.9%	14.1	3.7	B
EB	Left Turn	140	143	101.8%	17.9	3.3	B
	Through	1	2	152.0%	3.9	8.2	A
	Right Turn	239	240	100.3%	1.8	0.2	A
	Subtotal	380	384	101.0%	7.8	1.3	A
WB	Left Turn	4	2	57.0%	14.2	17.3	B
	Through	4	3	76.0%	11.9	14.0	B
	Right Turn	2	3	133.0%	1.6	1.8	A
	Subtotal	10	8	79.8%	15.2	13.6	B
Total		1,800	1,559	86.6%	11.2	1.4	B

SimTraffic Post-Processor **Washington Andora Widening**
Average Results from 10 Runs **Option 4 Closure Conditions**
Volume and Delay by Movement **PM Peak Hour**

Intersection 311 **Washington Blvd - Stop for NB Traffic** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn Through Right Turn	462	241	52.1%	592.7	72.6	F
	Subtotal	462	241	52.1%	592.7	72.6	F
SB	Left Turn Through Right Turn	481	236	49.0%	5.2	0.4	A
	Subtotal	481	236	49.0%	5.2	0.4	A
EB	Left Turn Through Right Turn						
	Subtotal						
WB	Left Turn Through Right Turn						
	Subtotal						
Total		943	477	50.5%	302.4	38.5	F

APPENDIX E

MITIGATION RESULTS

Intersection 1 **Washington Blvd/Pleasant Grove Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	263	228	86.7%	124.5	39.9	F
	Through	485	466	96.1%	45.1	3.0	D
	Right Turn	484	482	99.6%	10.3	0.9	B
	Subtotal	1,232	1,176	95.5%	46.3	8.8	D
SB	Left Turn	171	175	102.4%	124.5	25.4	F
	Through	856	809	94.5%	98.7	27.1	F
	Right Turn	32	36	111.6%	57.2	22.4	E
	Subtotal	1,059	1,020	96.3%	101.7	26.7	F
EB	Left Turn	71	70	98.5%	67.3	8.9	E
	Through	1,359	1,307	96.2%	46.0	12.5	D
	Right Turn	209	215	102.9%	41.5	10.2	D
	Subtotal	1,639	1,592	97.1%	46.2	11.5	D
WB	Left Turn	448	431	96.3%	75.1	17.0	E
	Through	1,568	1,511	96.4%	38.4	3.5	D
	Right Turn	57	57	100.0%	17.2	3.1	B
	Subtotal	2,073	2,000	96.5%	45.7	5.7	D
Total		6,003	5,788	96.4%	56.0	7.9	E

Intersection 2 **Washington Blvd/Emerald Oak Rd-Diamond Oaks Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	12	10	85.5%	32.6	15.8	C
	Through	1,077	1,042	96.8%	15.7	2.7	B
	Right Turn	91	92	100.6%	9.8	2.7	A
	Subtotal	1,180	1,144	97.0%	15.4	2.5	B
SB	Left Turn	144	129	89.5%	38.0	7.8	D
	Through	1,355	1,301	96.0%	15.5	4.6	B
	Right Turn	14	11	81.4%	8.0	3.7	A
	Subtotal	1,513	1,441	95.3%	17.5	4.1	B
EB	Left Turn	5	5	91.2%	27.7	22.5	C
	Through	2	3	133.0%	29.3	32.2	C
	Right Turn	9	9	97.1%	16.4	13.9	B
	Subtotal	16	16	99.8%	26.9	12.8	C
WB	Left Turn	82	86	104.7%	26.3	6.0	C
	Through	2	3	152.0%	12.6	17.8	B
	Right Turn	150	147	97.8%	11.3	1.5	B
	Subtotal	234	236	100.7%	16.8	2.4	B
Total		2,943	2,837	96.4%	16.7	2.6	B

Intersection 3 **Washington Blvd/Kaseberg Dr** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	34	33	98.4%	18.6	7.9	C
	Through	1,170	1,139	97.3%	3.1	0.5	A
	Right Turn						
	Subtotal	1,204	1,172	97.4%	3.5	0.5	A
SB	Left Turn						
	Through	1,416	1,363	96.3%	8.4	1.2	A
	Right Turn	30	31	102.6%	7.6	1.2	A
	Subtotal	1,446	1,394	96.4%	8.4	1.2	A
EB	Left Turn	10	11	110.2%	33.5	26.1	D
	Through						
	Right Turn	42	42	99.5%	17.7	7.6	C
	Subtotal	52	53	101.6%	22.4	10.5	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,702	2,619	96.9%	6.5	0.7	A

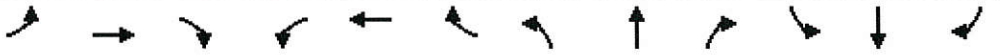
Intersection 4 **Washington Blvd/Sawtell Rd-Derek Pl** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	50	50	99.6%	42.3	7.5	D
	Through	1,123	1,096	97.6%	6.4	0.9	A
	Right Turn	22	25	114.0%	3.5	1.7	A
	Subtotal	1,195	1,170	97.9%	7.9	0.7	A
SB	Left Turn	17	14	84.9%	45.6	19.3	D
	Through	1,407	1,358	96.5%	13.4	2.1	B
	Right Turn	34	37	108.4%	11.8	1.8	B
	Subtotal	1,458	1,409	96.7%	13.7	2.0	B
EB	Left Turn	62	53	85.8%	33.5	8.2	C
	Through	1	0	38.0%	0.1	0.2	A
	Right Turn	25	23	92.7%	16.5	8.7	B
	Subtotal	88	77	87.2%	28.3	5.7	C
WB	Left Turn	35	38	108.6%	33.4	7.8	C
	Through	3	3	88.7%	17.6	27.8	B
	Right Turn	19	21	110.0%	9.5	4.9	A
	Subtotal	57	62	108.0%	25.5	5.3	C
Total		2,798	2,718	97.1%	11.9	1.3	B

SimTraffic Post-Processor **Washington Andora Widening**
Average Results from 10 Runs **Existing Plus Project Conditions**
Volume and Delay by Movement **PM Peak Hour (Mitigated)**

Intersection 5 **Washington Blvd/Junction Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	462	469	101.5%	35.9	2.3	D
	Through	731	714	97.7%	12.3	1.9	B
	Right Turn						
	Subtotal	1,193	1,183	99.2%	21.6	1.9	C
SB	Left Turn	4	4	95.0%	43.8	38.9	D
	Through	920	896	97.4%	28.4	10.9	C
	Right Turn	543	506	93.2%	23.9	8.2	C
	Subtotal	1,467	1,406	95.9%	26.9	9.7	C
EB	Left Turn	461	457	99.1%	32.8	4.9	C
	Through	1	0	0.0%	0.0	0.0	A
	Right Turn	224	215	95.8%	2.1	0.3	A
	Subtotal	686	671	97.9%	23.0	4.1	C
WB	Left Turn	4	3	76.0%	21.1	24.1	C
	Through	4	4	104.5%	15.4	13.9	B
	Right Turn	3	4	139.3%	4.5	6.9	A
	Subtotal	11	11	103.6%	19.4	14.7	B
Total		3,357	3,273	97.5%	24.2	5.1	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	203	167	91	98	354	659	148	1238	68	737	1279	210
Future Volume (veh/h)	203	167	91	98	354	659	148	1238	68	737	1279	210
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	226	186	20	109	393	409	164	1376	0	819	1421	0
Adj No. of Lanes	1	2	1	1	2	1	1	3	1	2	3	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	222	1041	461	148	894	395	205	1915	570	803	2515	757
Arrive On Green	0.13	0.29	0.29	0.08	0.25	0.25	0.12	0.38	0.00	0.23	0.49	0.00
Sat Flow, veh/h	1774	3539	1567	1774	3539	1565	1774	5085	1583	3442	5085	1583
Grp Volume(v), veh/h	226	186	20	109	393	409	164	1376	0	819	1421	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1567	1774	1770	1565	1774	1695	1583	1721	1695	1583
Q Serve(g_s), s	15.0	4.7	1.1	7.2	11.2	30.3	10.8	27.7	0.0	28.0	23.5	0.0
Cycle Q Clear(g_c), s	15.0	4.7	1.1	7.2	11.2	30.3	10.8	27.7	0.0	28.0	23.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	222	1041	461	148	894	395	205	1915	570	803	2515	757
V/C Ratio(X)	1.02	0.18	0.04	0.74	0.44	1.04	0.80	0.72	0.00	1.02	0.57	0.00
Avail Cap(c_a), veh/h	222	1041	461	207	894	395	266	1915	570	803	2515	757
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	52.5	31.6	30.3	53.7	37.7	44.8	51.7	32.0	0.0	46.0	21.3	0.0
Incr Delay (d2), s/veh	65.5	0.1	0.0	4.2	0.4	54.7	9.4	2.4	0.0	36.9	0.9	0.0
Initial Q Delay(d3),s/veh	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.4	2.3	0.5	3.7	5.5	19.0	5.8	13.4	0.0	17.4	11.1	0.0
LnGrp Delay(d),s/veh	118.1	31.7	30.3	58.0	38.1	99.6	61.1	34.3	0.0	82.9	22.2	0.0
LnGrp LOS	F	C	C	E	D	F	E	C		F	C	
Approach Vol, veh/h		432			911			1540			2240	
Approach Delay, s/veh		76.8			68.1			37.2			44.4	
Approach LOS		E			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.9	62.6	18.0	33.0	31.0	48.5	13.0	38.0
Change Period (Y+Rc), s	4.0	6.0	4.0	5.7	4.0	* 6	4.0	5.7
Max Green Setting (Gmax), s	17.0	42.0	14.0	27.3	27.0	* 32	13.0	28.3
Max Q Clear Time (g_c+I1), s	12.8	25.5	17.0	32.3	30.0	29.7	9.2	6.7
Green Ext Time (p_c), s	0.1	14.8	0.0	0.0	0.0	2.5	0.1	5.8

Intersection Summary	
HCM 2010 Ctrl Delay	49.2
HCM 2010 LOS	D

Notes

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Washington Blvd Widening
Option 3 - Mitigation
PM Peak Hour

Intersection 58 **Foothills Blvd/Pleasant Grove Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	493	489	99.2%	96.2	24.6	F
	Through	476	504	105.8%	44.4	4.3	D
	Right Turn	942	910	96.6%	7.6	1.3	A
	Subtotal	1,911	1,902	99.5%	40.2	7.8	D
SB	Left Turn	165	173	104.7%	60.2	8.1	E
	Through	807	834	103.3%	91.3	21.3	F
	Right Turn	173	170	98.2%	3.3	0.5	A
	Subtotal	1,145	1,176	102.7%	74.0	15.8	E
EB	Left Turn	134	143	106.7%	49.6	5.4	D
	Through	891	866	97.2%	45.9	2.4	D
	Right Turn	328	321	97.9%	4.6	0.7	A
	Subtotal	1,353	1,330	98.3%	36.3	1.9	D
WB	Left Turn	1,215	1,036	85.3%	120.0	23.5	F
	Through	1,215	1,096	90.2%	55.8	9.4	E
	Right Turn	42	37	87.4%	15.9	6.5	B
	Subtotal	2,472	2,169	87.7%	86.0	11.9	F
Total		6,881	6,578	95.6%	60.6	5.0	E

Scott, Elizabeth

From: Garry Horton <ghorton@markthomas.com>
Sent: Wednesday, November 09, 2016 3:20 PM
To: Bushnell-Bergfalk, Susan; Yoon, Laura
Subject: RE: Washington/Andora Air Quality - Appendix B (VMT) and Other Information Request

Sue
We still do not have Appendix B, however, per John Gard:

Heavy vehicles have been observed to be a very small percentage of all traffic on the study roadways. We assumed a default value of two percent heavy vehicles for our intersection analyses.

This makes sense to me because Washington Boulevard is not a truck route.

Garry W. Horton
(916) 381-9100 x5759 | (916) 403-5759 direct | (916) 899-3644 cell
Mark Thomas & Company

From: Bushnell-Bergfalk, Susan [mailto:Susan.Bushnell-Bergfalk@icf.com]
Sent: Wednesday, November 09, 2016 2:32 PM
To: Yoon, Laura; Garry Horton
Subject: RE: Washington/Andora Air Quality - Appendix B (VMT) and Other Information Request

Thanks for following up on the previous email.

Garry – can you send Appendix B and other information directly to Laura once you have it?

Susan Bushnell Bergfalk | Senior Project Manager | +1.916.752.0959 cell | susan.bushnell-bergfalk@icf.com | icf.com
ICF | 630 K Street, Suite 400, Sacramento, CA 95814

From: Yoon, Laura
Sent: Wednesday, November 09, 2016 12:43 PM
To: Bushnell-Bergfalk, Susan <Susan.Bushnell-Bergfalk@icf.com>; 'ghorton@markthomas.com' <ghorton@markthomas.com>
Subject: RE: Washington/Andora Air Quality - Appendix B (VMT) and Other Information Request

Hi Sue and Garry,

Just following up on my below email. Can we get Appendix B (VMT) from Fehr & Peers? I am also hoping to get a truck percentage number for the local roadways. Truck volumes will be required for the noise analysis.

Thanks!

LAURA YOON | Air Quality and Climate Change Supervisor | 916.231.9774

Truck Mix Traffic Data Source