

Section 7
APPENDICES

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APPENDIX B: Traffic Operation Calculations

APPENDIX C: Transfort Route Profiles

APPENDIX D: Crash Diagrams

APPENDIX E: Community Engagement Details

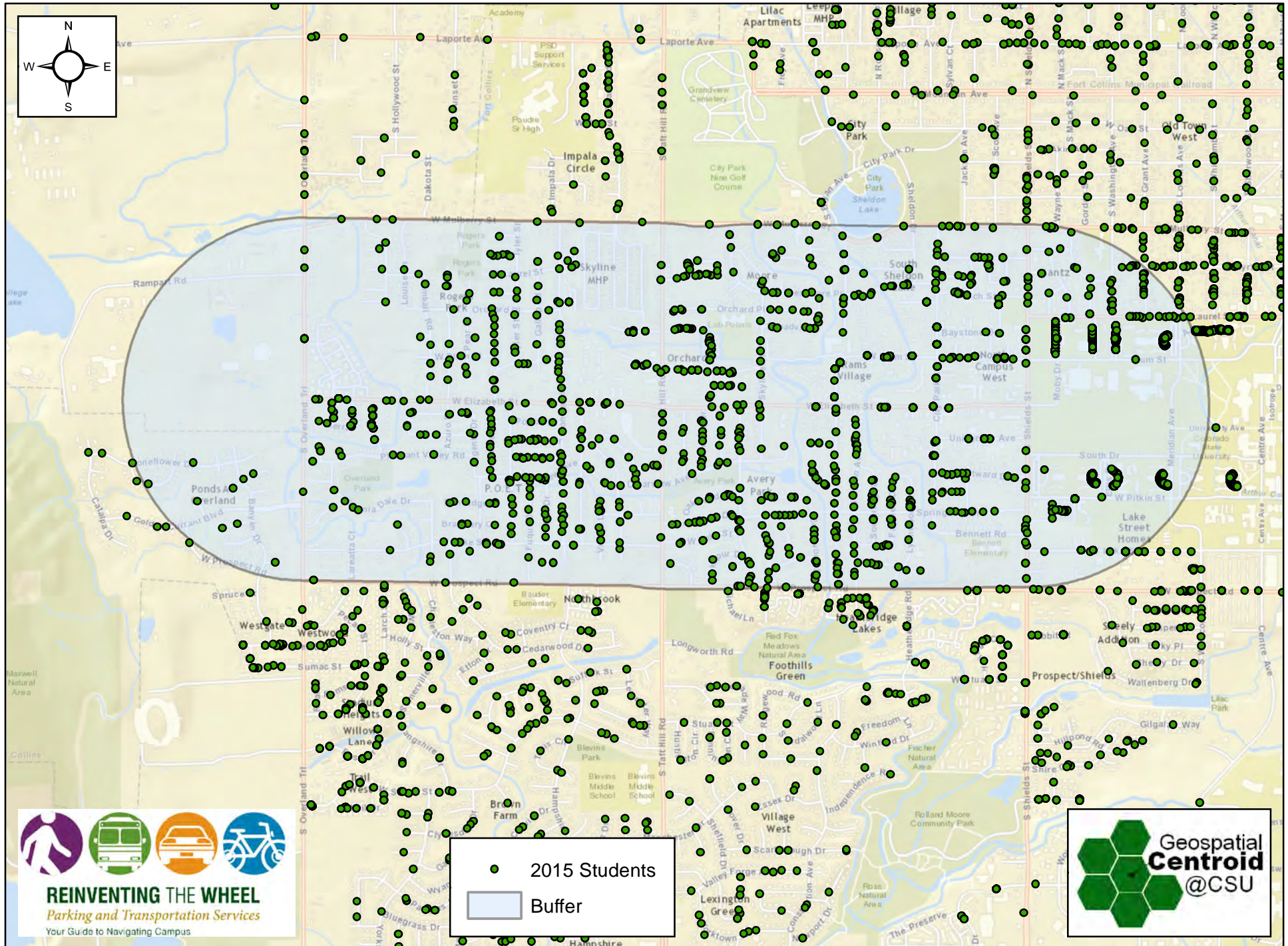


West Elizabeth  Enhanced Travel
Corridor Plan

APPENDIX A: CSU STUDENT AND EMPLOYEE RESIDENCE DATA

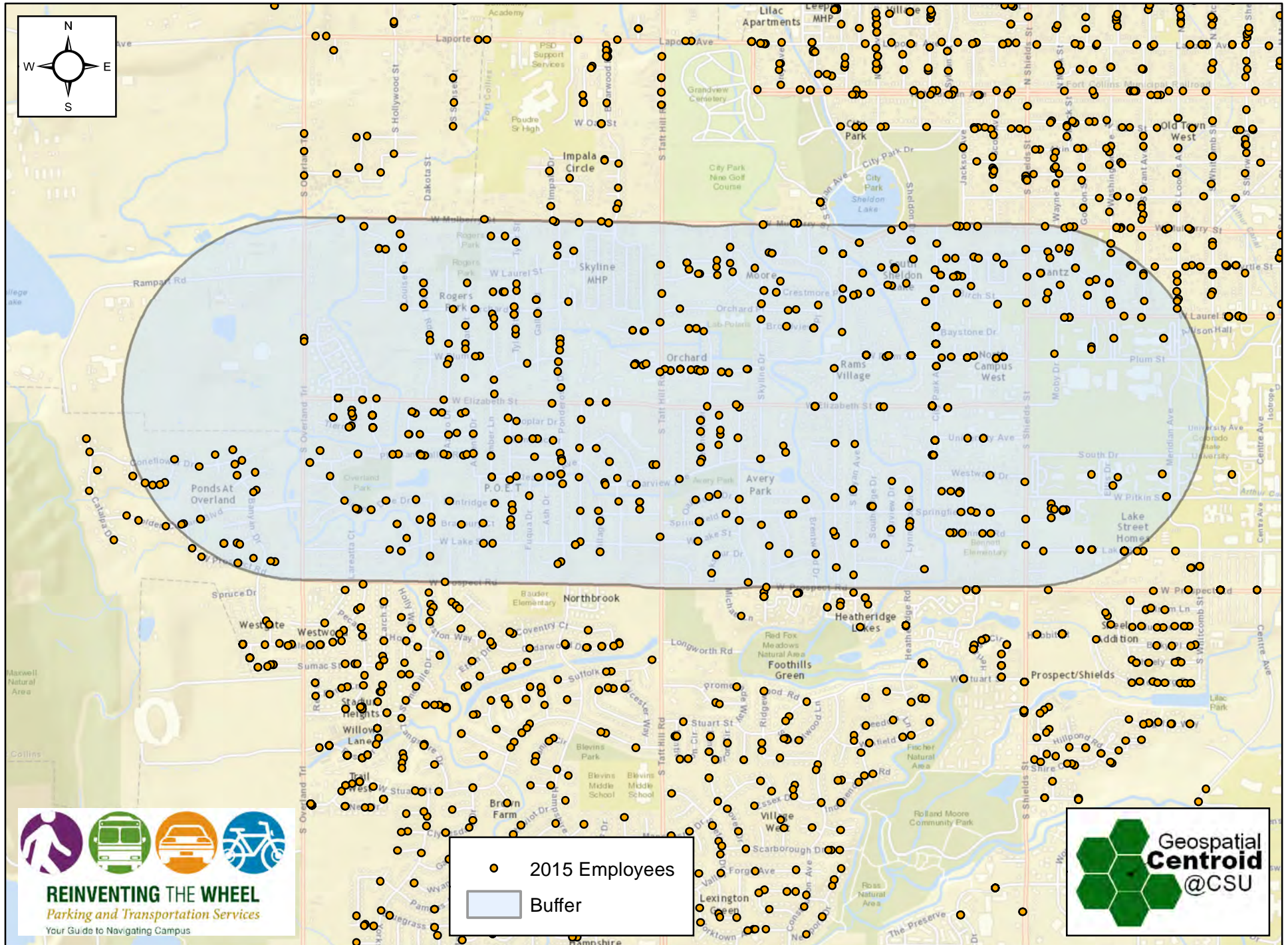


5,098 Students within West Elizabeth Study Area



Date: 7/14/2015

835 Employees within West Elizabeth Study Area



Date: 7/14/2015

APPENDIX B: TRAFFIC OPERATIONS CALCULATIONS



MOTORIZED VEHICLE DELAY AND LEVEL OF SERVICE



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

WCAP W Elizabeth St
Existing
AM Peak Hour

Intersection 2 Shields St/W Laurel St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)			Total Person Delay (min)
			Average	Percent	Average	Std. Dev.	LOS	
NB	Left Turn							
	Through	719	710	98.8%	6.7	1.8	A	87
	Right Turn	413	410	99.2%	9.1	1.7	A	68
	Subtotal	1,132	1,120	98.9%	7.6	1.5	A	155
SB	Left Turn	130	133	102.3%	24.8	4.7	C	61
	Through	667	659	98.8%	11.8	1.1	B	143
	Right Turn							
	Subtotal	797	792	99.4%	14.0	1.3	B	204
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	128	124	97.0%	45.7	4.9	D	104
	Through							
	Right Turn	61	58	94.9%	9.1	1.8	A	10
	Subtotal	189	182	96.3%	34.4	3.0	C	114
Total		2,118	2,094	98.9%	12.0	1.1	B	472

Intersection 3 Shields St/W Plum St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)			Total Person Delay (min)
			Average	Percent	Average	Std. Dev.	LOS	
NB	Left Turn	13	13	96.2%	8.0	7.0	A	2
	Through	1,064	1,057	99.4%	3.2	1.2	A	61
	Right Turn	37	39	104.3%	4.2	2.2	A	3
	Subtotal	1,114	1,108	99.5%	3.3	1.1	A	66
SB	Left Turn	13	13	100.8%	25.7	14.6	C	6
	Through	764	756	98.9%	5.5	0.6	A	77
	Right Turn	18	17	93.3%	6.3	3.7	A	2
	Subtotal	795	786	98.8%	5.9	0.7	A	85
EB	Left Turn	51	51	100.6%	59.8	14.9	E	56
	Through	25	32	126.0%	61.7	8.9	E	36
	Right Turn	34	34	98.5%	51.7	13.6	D	32
	Subtotal	110	116	105.7%	58.0	11.3	E	124
WB	Left Turn	17	18	104.7%	39.2	24.2	D	13
	Through	18	26	143.3%	41.1	10.2	D	19
	Right Turn	17	17	98.2%	10.2	6.4	B	3
	Subtotal	52	60	116.0%	33.2	8.4	C	35
Total		2,071	2,071	100.0%	9.4	1.1	A	310

Intersection 4 Shields St/W Elizabeth St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)			Total Person Delay (min)
			Average	Percent	Average	Std. Dev.	LOS	
NB	Left Turn	140	142	101.1%	27.9	6.6	C	72
	Through	851	841	98.8%	13.1	1.7	B	202
	Right Turn	54	55	101.5%	11.9	3.6	B	12
	Subtotal	1,045	1,038	99.3%	15.1	1.9	B	286
SB	Left Turn	24	24	97.9%	39.9	16.3	D	17
	Through	653	647	99.1%	7.4	2.2	A	88
	Right Turn	138	137	98.9%	3.3	0.7	A	8
	Subtotal	815	807	99.0%	7.7	2.0	A	114
EB	Left Turn	258	263	101.8%	42.9	4.8	D	206
	Through	27	27	100.4%	44.0	8.9	D	22
	Right Turn	296	294	99.4%	32.9	10.9	C	177
	Subtotal	581	584	100.5%	38.3	3.2	D	406
WB	Left Turn	15	14	92.7%	41.6	29.7	D	11
	Through	5	5	92.0%	17.8	25.0	B	1
	Right Turn	5	5	94.0%	8.4	15.5	A	1
	Subtotal	25	23	92.8%	37.8	23.9	D	13
Total		2,466	2,452	99.4%	18.3	1.3	B	819

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

WCAP W Elizabeth St
Existing
AM Peak Hour

Intersection 5		Shields St/Lake St			Signal			
Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)			Total Person Delay (min)
			Average	Percent	Average	Std. Dev.	LOS	
NB	Left Turn	1,178	1,182	100.4%	3.1	0.7	A	68
	Through	154	150	97.1%	3.7	1.4	A	10
	Right Turn	154	150	97.1%	3.7	1.4	A	10
	Subtotal	1,332	1,332	100.0%	3.2	0.7	A	78
SB	Left Turn	123	116	94.1%	37.7	7.5	D	80
	Through	768	752	97.9%	5.2	1.0	A	72
	Right Turn	123	116	94.1%	37.7	7.5	D	80
	Subtotal	891	868	97.4%	9.6	2.2	A	151
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	61	61	100.3%	46.3	3.3	D	52
	Through							
	Right Turn	37	35	94.6%	5.1	1.0	A	3
	Subtotal	98	96	98.2%	33.1	2.9	C	55
Total		2,321	2,296	98.9%	7.4	1.2	A	285

Intersection 6		Shields St/Prospect			Signal			
Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)			Total Person Delay (min)
			Average	Percent	Average	Std. Dev.	LOS	
NB	Left Turn	56	53	95.4%	25.6	6.2	C	25
	Through	946	940	99.4%	23.9	3.2	C	412
	Right Turn	136	133	97.6%	17.1	2.6	B	42
	Subtotal	1,138	1,126	99.0%	23.2	3.1	C	479
SB	Left Turn	145	153	105.3%	38.1	10.6	D	107
	Through	630	602	95.6%	7.2	1.3	A	80
	Right Turn	54	55	101.1%	2.5	0.6	A	2
	Subtotal	829	810	97.7%	13.2	2.9	B	189
EB	Left Turn	241	241	99.8%	171.5	47.8	F	756
	Through	713	727	101.9%	151.0	37.8	F	2,011
	Right Turn	152	145	95.1%	109.7	36.5	F	291
	Subtotal	1,106	1,112	100.5%	149.9	38.9	F	3,058
WB	Left Turn	71	71	99.9%	55.7	8.0	E	72
	Through	233	237	101.7%	41.7	5.1	D	181
	Right Turn	145	147	101.1%	32.4	6.7	C	87
	Subtotal	449	455	101.2%	41.1	4.7	D	341
Total		3,522	3,503	99.4%	66.8	14.0	E	4,067

Intersection 8		City Park Ave/W Elizabeth St			Signal			
Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)			Total Person Delay (min)
			Average	Percent	Average	Std. Dev.	LOS	
NB	Left Turn	24	27	110.4%	20.2	8.1	C	10
	Through	33	35	106.1%	20.4	2.5	C	13
	Right Turn	35	36	101.7%	9.3	2.9	A	6
	Subtotal	92	97	105.5%	16.8	3.3	B	29
SB	Left Turn	34	36	105.0%	26.8	8.1	C	18
	Through	32	33	104.1%	0.6	0.5	A	0
	Right Turn	18	25	136.1%	8.0	1.4	A	4
	Subtotal	84	94	111.3%	12.5	4.3	B	22
EB	Left Turn	53	52	97.5%	7.5	2.3	A	7
	Through	441	441	100.0%	5.2	1.1	A	42
	Right Turn	66	68	102.7%	7.5	1.3	A	9
	Subtotal	560	561	100.1%	5.7	1.0	A	59
WB	Left Turn	30	30	99.7%	13.0	4.4	B	7
	Through	160	159	99.1%	4.5	2.0	A	13
	Right Turn	45	42	93.6%	2.5	1.8	A	2
	Subtotal	235	231	98.1%	5.2	1.8	A	22
Total		971	982	101.1%	7.6	1.0	A	131

Intersection 9 Constitution Ave/W Elizabeth St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)			Total Person Delay (min)
			Average	Percent	Average	Std. Dev.	LOS	
NB	Left Turn	3	3	106.7%	7.4	7.2	A	0
	Through	4	4	87.5%	11.9	12.5	B	1
	Right Turn	20	20	102.0%	4.9	1.1	A	2
	Subtotal	27	27	100.4%	7.4	2.2	A	3
SB	Left Turn	36	38	105.3%	22.8	5.3	C	16
	Through	9	9	101.1%	26.1	8.1	C	4
	Right Turn	32	38	117.8%	8.5	3.0	A	6
	Subtotal	77	85	110.0%	16.7	3.3	B	26
EB	Left Turn	26	24	92.3%	5.5	2.4	A	2
	Through	499	497	99.7%	4.2	1.2	A	38
	Right Turn	5	5	108.0%	2.4	2.7	A	0
	Subtotal	530	527	99.4%	4.3	1.2	A	41
WB	Left Turn	2	2	75.0%	1.3	2.9	A	0
	Through	150	153	101.7%	3.2	1.9	A	9
	Right Turn	15	22	144.7%	5.8	2.9	A	2
	Subtotal	167	176	105.3%	3.5	1.7	A	11
Total		801	814	101.7%	6.0	1.2	A	82

Intersection 11 Taft Hill Rd/W Elizabeth St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)			Total Person Delay (min)
			Average	Percent	Average	Std. Dev.	LOS	
NB	Left Turn	51	49	95.3%	16.6	5.1	B	15
	Through	739	740	100.2%	19.5	2.0	B	265
	Right Turn	111	105	94.3%	18.2	2.0	B	35
	Subtotal	901	894	99.2%	19.2	2.0	B	314
SB	Left Turn	91	94	103.7%	23.6	5.0	C	41
	Through	547	550	100.5%	13.8	1.4	B	139
	Right Turn	47	48	102.1%	12.5	4.6	B	11
	Subtotal	685	692	101.1%	15.0	1.5	B	191
EB	Left Turn	121	122	100.8%	32.3	5.1	C	72
	Through	239	243	101.5%	44.9	3.2	D	200
	Right Turn	153	154	100.6%	17.8	4.8	B	50
	Subtotal	513	519	101.1%	33.9	3.6	C	322
WB	Left Turn	100	98	98.3%	29.4	2.5	C	53
	Through	109	116	106.3%	30.7	3.6	C	65
	Right Turn	32	33	103.4%	5.9	2.0	A	4
	Subtotal	241	247	102.6%	27.4	2.7	C	122
Total		2,340	2,352	100.5%	22.1	1.9	C	949

Intersection 12 Overland Trail/W Elizabeth St Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)			Total Person Delay (min)
			Average	Percent	Average	Std. Dev.	LOS	
NB	Left Turn	4	4	97.5%	3.0	1.9	A	0
	Through	455	447	98.2%	0.5	0.1	A	4
	Right Turn	69	68	98.1%	0.9	0.1	A	1
	Subtotal	528	519	98.2%	0.6	0.1	A	6
SB	Left Turn	33	38	115.2%	7.7	1.9	A	5
	Through	272	282	103.5%	0.4	0.1	A	2
	Right Turn	10	10	103.0%	0.4	0.2	A	0
	Subtotal	315	330	104.7%	1.2	0.3	A	8
EB	Left Turn	11	12	108.2%	9.5	4.0	A	2
	Through	1	1	100.0%	0.7	2.1	A	0
	Right Turn	1	1	60.0%	1.0	2.1	A	0
	Subtotal	13	14	103.8%	9.3	4.0	A	2
WB	Left Turn	51	56	109.0%	23.0	8.6	C	23
	Through	4	4	95.0%	6.1	6.0	A	0
	Right Turn	65	64	98.5%	15.2	6.1	C	18
	Subtotal	120	123	102.8%	19.0	7.6	C	42
Total		976	985	101.0%	3.2	1.0	A	57

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

WCAP W Elizabeth St
Existing
PM Peak Hour

Intersection 2		Shields St/W Laurel St			Signal			
Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)			Total Person Delay (min)
			Average	Percent	Average	Std. Dev.	LOS	
NB	Left Turn	858	840	97.9%	6.9	2.0	A	107
	Through	428	422	98.5%	8.9	1.7	A	69
	Right Turn							
	Subtotal	1,286	1,261	98.1%	7.6	1.7	A	176
SB	Left Turn	99	96	97.3%	48.6	10.1	D	86
	Through	971	932	96.0%	17.5	1.9	B	298
	Right Turn							
	Subtotal	1,070	1,028	96.1%	20.7	2.1	C	384
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	497	495	99.5%	65.5	11.3	E	594
	Through							
	Right Turn	154	151	97.8%	38.1	12.3	D	105
	Subtotal	651	645	99.1%	59.7	11.3	E	699
Total		3,007	2,935	97.6%	24.0	3.3	C	1259

Intersection 3		Shields St/W Plum St			Signal			
Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)			Total Person Delay (min)
			Average	Percent	Average	Std. Dev.	LOS	
NB	Left Turn	70	62	88.6%	129.0	63.7	F	147
	Through	1,205	1,189	98.6%	3.8	0.6	A	82
	Right Turn	56	60	107.0%	3.2	1.6	A	3
	Subtotal	1,331	1,310	98.5%	10.2	5.2	B	232
SB	Left Turn	18	16	90.0%	38.0	13.3	D	11
	Through	1,390	1,354	97.4%	8.7	3.4	A	216
	Right Turn	60	57	95.5%	6.6	2.8	A	7
	Subtotal	1,468	1,427	97.2%	9.0	3.3	A	234
EB	Left Turn	59	54	92.0%	70.3	18.8	E	70
	Through	23	26	113.5%	73.5	23.4	E	35
	Right Turn	61	59	97.0%	73.1	25.6	E	79
	Subtotal	143	140	97.6%	72.7	20.6	E	185
WB	Left Turn	56	50	90.0%	64.7	40.5	E	60
	Through	24	28	117.1%	63.1	25.7	E	33
	Right Turn	22	20	90.0%	27.5	12.7	C	10
	Subtotal	102	98	96.4%	56.6	32.9	E	102
Total		3,044	2,976	97.8%	14.0	3.6	B	754

Intersection 4		Shields St/W Elizabeth St			Signal			
Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)			Total Person Delay (min)
			Average	Percent	Average	Std. Dev.	LOS	
NB	Left Turn	273	252	92.4%	122.8	43.6	F	568
	Through	1,001	983	98.2%	39.2	21.5	D	707
	Right Turn	57	57	100.7%	28.5	17.6	C	30
	Subtotal	1,331	1,292	97.1%	54.0	25.7	D	1305
SB	Left Turn	10	8	82.0%	40.9	27.7	D	6
	Through	1,067	1,036	97.1%	25.4	6.8	C	483
	Right Turn	430	412	95.7%	16.5	4.9	B	125
	Subtotal	1,507	1,456	96.6%	23.1	6.0	C	614
EB	Left Turn	324	326	100.7%	59.2	6.7	E	354
	Through	48	46	95.8%	63.9	11.7	E	54
	Right Turn	379	355	93.7%	60.8	19.7	E	396
	Subtotal	751	727	96.9%	60.7	10.3	E	804
WB	Left Turn	61	63	103.3%	41.0	10.4	D	47
	Through	36	35	96.9%	46.5	8.9	D	30
	Right Turn	6	4	73.3%	13.0	14.7	B	1
	Subtotal	103	102	99.3%	43.0	6.9	D	78
Total		3,692	3,578	96.9%	41.7	8.6	D	2801

Intersection 5 Shields St/Lake St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS	Total Person Delay (min)
			Average	Percent	Average	Std. Dev.		
NB	Left Turn							
	Through	1,268	1,261	99.4%	2.8	0.5	A	65
	Right Turn	52	51	98.8%	2.8	1.3	A	3
	Subtotal	1,320	1,312	99.4%	2.8	0.5	A	68
SB	Left Turn	92	90	97.4%	40.0	9.2	D	66
	Through	1,360	1,300	95.6%	16.1	5.6	B	384
	Right Turn							
	Subtotal	1,452	1,389	95.7%	17.6	5.6	B	450
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	117	117	99.8%	48.8	8.6	D	104
	Through							
	Right Turn	157	155	98.7%	8.1	1.7	A	23
	Subtotal	274	272	99.2%	26.6	5.3	C	127
Total		3,046	2,973	97.6%	12.2	3.1	B	645

Intersection 6 Shields St/Prospect Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS	Total Person Delay (min)
			Average	Percent	Average	Std. Dev.		
NB	Left Turn	160	159	99.1%	53.1	4.6	D	154
	Through	908	901	99.2%	34.5	5.0	C	570
	Right Turn	137	135	98.5%	22.9	3.4	C	57
	Subtotal	1,205	1,195	99.1%	35.9	4.3	D	781
SB	Left Turn	218	220	101.0%	55.3	14.2	E	223
	Through	1,080	1,015	94.0%	23.7	6.1	C	441
	Right Turn	179	170	94.9%	14.4	5.6	B	45
	Subtotal	1,477	1,405	95.1%	28.0	5.8	C	709
EB	Left Turn	158	154	97.4%	57.5	6.2	E	162
	Through	396	395	99.7%	41.2	3.7	D	298
	Right Turn	159	163	102.2%	19.4	2.6	B	58
	Subtotal	713	711	99.8%	39.5	3.0	D	518
WB	Left Turn	196	181	92.2%	111.4	12.8	F	369
	Through	637	624	97.9%	97.5	13.1	F	1115
	Right Turn	254	251	98.9%	98.8	12.2	F	455
	Subtotal	1,087	1,056	97.1%	100.2	12.1	F	1939
Total		4,482	4,367	97.4%	50.6	3.1	D	3948

Intersection 8 City Park Ave/W Elizabeth St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS	Total Person Delay (min)
			Average	Percent	Average	Std. Dev.		
NB	Left Turn	155	155	100.0%	34.4	10.7	C	98
	Through	107	106	99.3%	24.9	6.9	C	49
	Right Turn	87	87	100.5%	20.3	9.0	C	33
	Subtotal	349	349	99.9%	28.1	9.2	C	179
SB	Left Turn	73	74	100.7%	23.1	9.5	C	31
	Through	101	103	101.8%	2.8	2.0	A	5
	Right Turn	51	56	109.6%	13.9	3.0	B	14
	Subtotal	225	232	103.2%	12.1	4.9	B	51
EB	Left Turn	61	60	98.0%	18.7	3.7	B	21
	Through	508	501	98.6%	7.9	0.6	A	72
	Right Turn	96	96	99.5%	10.3	1.3	B	18
	Subtotal	665	656	98.7%	9.3	0.7	A	111
WB	Left Turn	89	84	94.8%	28.2	5.3	C	44
	Through	491	463	94.3%	9.5	1.0	A	80
	Right Turn	77	73	94.7%	9.9	1.7	A	13
	Subtotal	657	620	94.4%	12.0	1.2	B	137
Total		1,896	1,857	98.0%	14.5	2.4	B	477

Intersection 9					Constitution Ave/W Elizabeth St			Signal	
Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)			Total Person Delay (min)	
			Average	Percent	Average	Std. Dev.	LOS		
NB	Left Turn	2	2	85.0%	6.3	11.8	A	0	
	Through	26	25	94.2%	22.8	8.8	C	10	
	Right Turn	35	35	98.6%	6.7	3.5	A	4	
	Subtotal	63	61	96.3%	13.2	3.2	B	15	
SB	Left Turn	36	36	100.6%	25.4	8.2	C	17	
	Through	22	20	90.9%	20.4	7.4	C	7	
	Right Turn	74	81	108.8%	12.6	2.6	B	19	
	Subtotal	132	137	103.6%	17.1	3.3	B	43	
EB	Left Turn	47	46	98.5%	26.3	14.4	C	22	
	Through	531	524	98.7%	5.8	1.1	A	56	
	Right Turn	6	7	115.0%	3.2	3.1	A	0	
	Subtotal	584	578	98.9%	7.4	1.8	A	78	
WB	Left Turn	39	40	103.3%	8.5	3.4	A	6	
	Through	622	586	94.2%	8.8	3.7	A	95	
	Right Turn	47	52	111.5%	10.2	4.2	B	10	
	Subtotal	708	679	95.9%	8.9	3.5	A	111	
Total		1,487	1,454	97.8%	9.0	2.3	A	247	

Intersection 11					Taft Hill Rd/W Elizabeth St			Signal	
Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)			Total Person Delay (min)	
			Average	Percent	Average	Std. Dev.	LOS		
NB	Left Turn	136	131	96.0%	33.9	4.4	C	81	
	Through	577	578	100.2%	20.6	2.2	C	219	
	Right Turn	129	125	97.1%	17.0	2.8	B	39	
	Subtotal	842	834	99.0%	22.3	1.8	C	339	
SB	Left Turn	106	107	100.8%	47.3	14.7	D	93	
	Through	768	747	97.3%	32.7	6.9	C	448	
	Right Turn	84	86	101.9%	34.6	9.1	C	54	
	Subtotal	958	939	98.1%	34.5	7.6	C	595	
EB	Left Turn	162	158	97.5%	56.9	19.1	E	165	
	Through	305	308	100.8%	47.2	6.4	D	266	
	Right Turn	121	115	95.0%	27.9	8.5	C	59	
	Subtotal	588	580	98.7%	46.2	10.0	D	490	
WB	Left Turn	178	164	92.2%	53.6	17.8	D	161	
	Through	319	308	96.4%	41.4	9.8	D	233	
	Right Turn	77	75	97.3%	10.3	4.2	B	14	
	Subtotal	574	547	95.2%	41.4	10.2	D	409	
Total		2,962	2,900	97.9%	34.3	4.0	C	1832	

Intersection 12					Overland Trail/W Elizabeth St				Side-street Stop	
Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)			Total Person Delay (min)		
			Average	Percent	Average	Std. Dev.	LOS			
NB	Left Turn	2	2	95.0%	3.4	4.6	A	0		
	Through	322	319	99.0%	0.5	0.1	A	3		
	Right Turn	83	80	96.9%	1.1	0.2	A	2		
	Subtotal	407	401	98.6%	0.6	0.1	A	4		
SB	Left Turn	73	75	102.7%	4.5	1.1	A	6		
	Through	537	539	100.3%	0.6	0.1	A	5		
	Right Turn	7	9	125.7%	0.7	0.4	A	0		
	Subtotal	617	622	100.9%	1.0	0.2	A	12		
EB	Left Turn	2	3	140.0%	8.4	11.2	A	0		
	Through									
	Right Turn	3	3	96.7%	2.5	2.6	A	0		
	Subtotal	5	6	114.0%	7.5	10.0	A	1		
WB	Left Turn	69	67	97.1%	26.8	7.0	D	33		
	Through	5	6	124.0%	8.0	7.2	A	1		
	Right Turn	67	64	96.1%	10.3	2.5	B	12		
	Subtotal	141	138	97.6%	18.1	3.9	C	46		
Total		1,170	1,167	99.7%	3.1	0.6	A	63		

TRANSIT INTERSECTION DELAY



AM PEAK HOUR



Intersection 2 Shields St/W Laurel St

Direction	Movement	Demand		Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
		Volume (vph)	Riders (pp4h)	Average	Percent	Average	Std. Dev.	
NB	Left Turn							
	Through							
	Right Turn	2	101	2	100.0%	0.0	0.0	0.0
	Subtotal	2	101	2	100.0%	0.0	0.0	0.0
SB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	2	19	2	100.0%	52.8	5.1	4.2
	Through							
	Right Turn							
	Subtotal	2	19	2	100.0%	52.8	5.1	4.2
Total		4	120	4	100.0%	35.2	3.4	4.2

Intersection 3 Shields St/W Plum St

Direction	Movement	Demand		Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
		Volume (vph)	Riders (pp4h)	Average	Percent	Average	Std. Dev.	
NB	Left Turn							
	Through	2	101	2	100.0%	0.0	0.0	0.0
	Right Turn	3	205	3	100.0%	11.5	9.0	9.8
	Subtotal	5	306	5	100.0%	11.5	9.0	9.8
SB	Left Turn							
	Through	2	19	2	100.0%	16.4	2.9	1.3
	Right Turn							
	Subtotal	2	19	2	100.0%	16.4	2.9	1.3
EB	Left Turn							
	Through	6	490	6	100.0%	78.6	40.5	160.4
	Right Turn							
	Subtotal	6	490	6	100.0%	78.6	40.5	160.4
WB	Left Turn	2	16	2	100.0%	92.4	6.6	6.2
	Through	8	58	8	100.0%	55.0	36.0	13.3
	Right Turn							
	Subtotal	10	74	10	100.0%	67.4	22.9	19.4
Total		23	889	23	100.0%	51.5	15.9	191.0

Intersection 4 Shields St/W Elizabeth St

Direction	Movement	Demand		Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
		Volume (vph)	Riders (pp4h)	Average	Percent	Average	Std. Dev.	
NB	Left Turn							
	Through	2	101	2	100.0%	43.2	29.0	18.2
	Right Turn							
	Subtotal	2	101	2	100.0%	43.2	29.0	18.2
SB	Left Turn							
	Through	2	19	2	100.0%	0.0	0.0	0.0
	Right Turn	2	16	2	100.0%	0.0	0.0	0.0
	Subtotal	4	35	4	100.0%	0.0	0.0	0.0
EB	Left Turn	3	205	3	100.0%	45.8	32.0	39.1
	Through							
	Right Turn							
	Subtotal	3	205	3	100.0%	45.8	32.0	39.1
WB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
Total		9	341	9	100.0%	29.7	13.1	57.3

Intersection 5 Shields St/Lake St

Direction	Movement	Demand		Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
		Volume (vph)	Riders (pp4h)	Average	Percent	Average	Std. Dev.	
NB	Left Turn							
	Through	2	243	2	100.0%	0.0	0.0	0.0
	Right Turn							
	Subtotal	2	243	2	100.0%	0.0	0.0	0.0
SB	Left Turn							
	Through	2	25	2	100.0%	3.4	3.3	0.4
	Right Turn							
	Subtotal	2	25	2	100.0%	3.4	3.3	0.4
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
Total		4	268	4	100.0%	2.2	2.2	0.4

Intersection 6 Shields St/Prospect

Direction	Movement	Demand		Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
		Volume (vph)	Riders (pp4h)	Average	Percent	Average	Std. Dev.	
NB	Left Turn							
	Through	2	103	2	100.0%	55.1	9.3	23.6
	Right Turn							
	Subtotal	2	103	2	100.0%	55.1	9.3	23.6
SB	Left Turn							
	Through	2	25	2	100.0%	0.0	0.0	0.0
	Right Turn							
	Subtotal	2	25	2	100.0%	0.0	0.0	0.0
EB	Left Turn	2	139	2	100.0%	171.5	47.8	99.3
	Through							
	Right Turn							
	Subtotal		139					99.3
WB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
Total		4	267	4	100.0%	36.7	6.2	123.0

Intersection 8 City Park Ave/W Elizabeth St

Direction	Movement	Demand		Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
		Volume (vph)	Riders (pp4h)	Average	Percent	Average	Std. Dev.	
NB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
SB	Left Turn							
	Through							
	Right Turn	6	154	6	100.0%	30.3	10.0	19.4
	Subtotal	6	154	6	100.0%	30.3	10.0	19.4
EB	Left Turn							
	Through	3	201	3	100.0%	18.2	10.6	15.2
	Right Turn							
	Subtotal	3	201	3	100.0%	18.2	10.6	15.2
WB	Left Turn							
	Through	2	16	2	100.0%	15.3	9.2	1.0
	Right Turn							
	Subtotal	2	16	2	100.0%	15.3	9.2	1.0
Total		11	371	11	100.0%	23.6	6.8	35.7

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

Transit AM Peak

Intersection 9 Constitution Ave/W Elizabeth St

Direction	Movement	Demand		Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
		Volume (vph)	Riders (pp4h)	Average	Percent	Average	Std. Dev.	
NB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
SB	Left Turn							
	Through							
	Right Turn	2	12	2	100.0%	12.4	10.0	0.6
	Subtotal	2	12	2	100.0%	12.4	10.0	0.6
EB	Left Turn							
	Through	3	196	3	100.0%	26.5	29.7	21.7
	Right Turn							
	Subtotal	3	196	3	100.0%	26.5	29.7	21.7
WB	Left Turn							
	Through	2	19	2	100.0%	19.9	9.8	1.6
	Right Turn	6	198	6	100.0%	12.6	5.4	10.4
	Subtotal	8	217	8	100.0%	15.0	5.3	12.0
Total		13	425	13	100.0%	17.0	8.1	34.2

Intersection 11 Taft Hill Rd/W Elizabeth St

Direction	Movement	Demand		Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
		Volume (vph)	Riders (pp4h)	Average	Percent	Average	Std. Dev.	
NB	Left Turn							
	Through	1	38	1	100.0%	19.5	2.0	3.1
	Right Turn							
	Subtotal		38					3.1
SB	Left Turn							
	Through	1	9	1	100.0%	13.8	1.4	0.5
	Right Turn							
	Subtotal		9					0.5
EB	Left Turn							
	Through	4	160	4	100.0%	85.2	13.4	56.8
	Right Turn							
	Subtotal	4	160	4	100.0%	85.2	13.4	56.8
WB	Left Turn							
	Through	4	29	4	102.5%	46.4	16.1	5.6
	Right Turn							
	Subtotal	4	29	4	102.5%	46.4	16.1	5.6
Total		8	236	8	101.3%	60.0	14.2	66.0

Intersection 12 Overland Trail/W Elizabeth St

Direction	Movement	Demand		Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
		Volume (vph)	Riders (pp4h)	Average	Percent	Average	Std. Dev.	
NB	Left Turn							
	Through							
	Right Turn	2	26	2	100.0%	0.0	0.0	0.0
	Subtotal	2	26	2	100.0%	0.0	0.0	0.0
SB	Left Turn	2	7	2	100.0%	12.6	8.9	0.4
	Through							
	Right Turn							
	Subtotal	2	7	2	100.0%	12.6	8.9	0.4
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	2	65	2	100.0%	0.0	0.0	0.0
	Through							
	Right Turn	2	16	2	100.0%	64.8	26.8	4.3
	Subtotal	4	81	4	100.0%	64.8	26.8	4.3
Total		8	114	8	100.0%	31.0	10.8	4.7

PM PEAK HOUR



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

Transit PM Peak

Intersection 2 Shields St/W Laurel St

Direction	Movement	Demand		Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
		Volume (vph)	Riders (pp4h)	Average	Percent	Average	Std. Dev.	
NB	Left Turn							
	Through							
	Right Turn	2	19	2	100.0%	0.0	0.0	0.0
	Subtotal	2	19	2	100.0%	0.0	0.0	0.0
SB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	2	73	2	100.0%	96.2	48.1	29.2
	Through							
	Right Turn							
	Subtotal	2	73	2	100.0%	96.2	48.1	29.2
Total		4	92	4	100.0%	64.1	32.1	29.2

Intersection 3 Shields St/W Plum St

Direction	Movement	Demand		Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
		Volume (vph)	Riders (pp4h)	Average	Percent	Average	Std. Dev.	
NB	Left Turn	2	18	2	100.0%	0.0	0.0	0.0
	Through							
	Right Turn	3	62	3	100.0%	4.6	5.1	1.2
	Subtotal	5	80	5	100.0%	4.6	5.1	1.2
SB	Left Turn	2	73	2	100.0%	18.8	15.1	5.7
	Through							
	Right Turn							
	Subtotal	2	73	2	100.0%	18.8	15.1	5.7
EB	Left Turn	6	211	6	100.0%	116.6	51.6	102.5
	Through							
	Right Turn							
	Subtotal	6	211	6	100.0%	116.6	51.6	102.5
WB	Left Turn	2	90	2	100.0%	120.3	37.5	45.1
	Through	8	795	8	100.0%	64.3	28.1	212.9
	Right Turn							
	Subtotal	10	885	10	100.0%	83.0	28.2	258.1
Total		23	1,249	23	100.0%	64.8	12.4	367.5

Intersection 4 Shields St/W Elizabeth St

Direction	Movement	Demand		Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
		Volume (vph)	Riders (pp4h)	Average	Percent	Average	Std. Dev.	
NB	Left Turn							
	Through	2	18	2	100.0%	74.3	24.1	5.6
	Right Turn							
	Subtotal	2	18	2	100.0%	74.3	24.1	5.6
SB	Left Turn							
	Through	2	73	2	100.0%	0.0	0.0	0.0
	Right Turn	2	90	2	100.0%	0.0	0.0	0.0
	Subtotal	4	163	4	100.0%	0.0	0.0	0.0
EB	Left Turn	3	62	3	100.0%	48.0	34.4	12.4
	Through							
	Right Turn							
	Subtotal	3	62	3	100.0%	48.0	34.4	12.4
WB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
Total		9	243	9	100.0%	40.8	16.3	18.0

Intersection 5 Shields St/Lake St

Direction	Movement	Demand		Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
		Volume (vph)	Riders (pp4h)	Average	Percent	Average	Std. Dev.	
NB	Left Turn							
	Through	2	124	2	100.0%	0.0	0.0	0.0
	Right Turn							
	Subtotal	2	124	2	100.0%	0.0	0.0	0.0
SB	Left Turn							
	Through	2	75	2	100.0%	29.4	15.5	9.2
	Right Turn							
	Subtotal	2	75	2	100.0%	29.4	15.5	9.2
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
Total		4	199	4	100.0%	19.6	10.3	9.2

Intersection 6 Shields St/Prospect

Direction	Movement	Demand		Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
		Volume (vph)	Riders (pp4h)	Average	Percent	Average	Std. Dev.	
NB	Left Turn							
	Through	2	26	2	100.0%	0.0	0.0	0.0
	Right Turn							
	Subtotal	2	26	2	100.0%	0.0	0.0	0.0
SB	Left Turn							
	Through	2	75	2	100.0%	35.6	39.9	11.1
	Right Turn							
	Subtotal	2	75	2	100.0%	35.6	39.9	11.1
EB	Left Turn	2	99	2	100.0%	57.5	6.2	23.7
	Through							
	Right Turn							
	Subtotal		99					23.7
WB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
Total		4	200	4	100.0%	23.8	26.6	34.8

Intersection 8 City Park Ave/W Elizabeth St

Direction	Movement	Demand		Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
		Volume (vph)	Riders (pp4h)	Average	Percent	Average	Std. Dev.	
NB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
SB	Left Turn							
	Through							
	Right Turn	6	365	6	100.0%	76.5	11.0	116.3
	Subtotal	6	365	6	100.0%	76.5	11.0	116.3
EB	Left Turn							
	Through	3	71	3	100.0%	27.9	10.1	8.2
	Right Turn							
	Subtotal	3	71	3	100.0%	27.9	10.1	8.2
WB	Left Turn							
	Through	2	90	2	100.0%	15.2	5.0	5.7
	Right Turn							
	Subtotal	2	90	2	100.0%	15.2	5.0	5.7
Total		11	526	11	100.0%	49.0	6.9	130.3

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

Transit PM Peak

Intersection 9 Constitution Ave/W Elizabeth St

Direction	Movement	Demand		Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
		Volume (vph)	Riders (pp4h)	Average	Percent	Average	Std. Dev.	
NB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
SB	Left Turn							
	Through							
	Right Turn	2	199	2	100.0%	43.2	18.1	35.8
	Subtotal	2	199	2	100.0%	43.2	18.1	35.8
EB	Left Turn							
	Through	3	74	3	100.0%	27.0	13.2	8.3
	Right Turn							
	Subtotal	3	74	3	100.0%	27.0	13.2	8.3
WB	Left Turn							
	Through	2	88	2	95.0%	27.6	26.6	10.1
	Right Turn	6	316	6	98.3%	16.7	8.8	22.0
	Subtotal	8	404	8	97.5%	20.6	7.9	32.1
Total		13	677	13	98.5%	27.6	6.3	76.2

Intersection 11 Taft Hill Rd/W Elizabeth St

Direction	Movement	Demand		Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
		Volume (vph)	Riders (pp4h)	Average	Percent	Average	Std. Dev.	
NB	Left Turn							
	Through		14	1	100.0%	20.6	2.2	1.2
	Right Turn							
	Subtotal		14					1.2
SB	Left Turn							
	Through		13	1	100.0%	32.7	6.9	1.8
	Right Turn							
	Subtotal		13					1.8
EB	Left Turn							
	Through	4	71	4	92.5%	106.7	26.6	31.6
	Right Turn							
	Subtotal	4	71	4	92.5%	106.7	26.6	31.6
WB	Left Turn							
	Through	4	261	4	100.0%	50.5	24.5	54.9
	Right Turn							
	Subtotal	4	261	4	100.0%	50.5	24.5	54.9
Total		8	359	8	96.3%	81.8	18.0	89.4

Intersection 12 Overland Trail/W Elizabeth St

Direction	Movement	Demand		Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
		Volume (vph)	Riders (pp4h)	Average	Percent	Average	Std. Dev.	
NB	Left Turn							
	Through							
	Right Turn	2	59	2	100.0%	0.0	0.0	0.0
	Subtotal	2	59	2	100.0%	0.0	0.0	0.0
SB	Left Turn	2	6	2	100.0%	12.1	6.8	0.3
	Through							
	Right Turn							
	Subtotal	2	6	2	100.0%	12.1	6.8	0.3
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	2	55	2	95.0%	12.1	25.4	2.8
	Through							
	Right Turn	2	7	2	100.0%	57.1	4.9	1.7
	Subtotal	4	62	4	97.5%	57.8	4.5	4.4
Total		8	127	8	98.8%	29.7	4.8	4.7

BICYCLE INTERSECTION DELAY



AM PEAK HOUR



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

Bicycle AM Peak

Intersection 2 Shields St/W Laurel St

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
			Average	Percent	Average	Std. Dev.	
NB	Left Turn						
	Through	10	23	232.0%	8.3	3.9	1.4
	Right Turn	5	4	82.0%	0.1	0.5	0.0
	Subtotal	15	27	182.0%	7.1	3.1	1.4
SB	Left Turn	15	12	77.3%	16.8	11.1	4.2
	Through	4	3	65.0%	2.6	5.6	0.2
	Right Turn						
	Subtotal	19	14	74.7%	15.1	9.2	4.4
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	5	4	78.0%	34.4	31.6	2.9
	Through						
	Right Turn						
	Subtotal	5	4	78.0%	34.4	31.6	2.9
Total		39	45	116.4%	12.3	4.5	8.6

Intersection 3 Shields St/W Plum St

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		Delay (min)
			Average	Percent	Average	Std. Dev.	
NB	Left Turn						
	Through	14	12	84.3%	6.7	10.4	1.6
	Right Turn	5	4	82.0%	0.0	0.0	0.0
	Subtotal	19	16	83.7%	6.7	10.4	1.6
SB	Left Turn	3	3	86.7%	7.9	13.5	0.4
	Through	5	3	60.0%	0.1	0.4	0.0
	Right Turn	1	1	90.0%	0.0	0.0	0.0
	Subtotal	9	7	72.2%	4.4	6.7	0.4
EB	Left Turn	1	1	100.0%	8.4	26.5	0.1
	Through	140	138	98.6%	36.0	3.2	84.0
	Right Turn	2	2	90.0%	8.8	16.1	0.3
	Subtotal	143	141	98.5%	35.9	3.2	84.4
WB	Left Turn						
	Through	7	4	55.7%	19.5	27.5	2.3
	Right Turn						
	Subtotal	7	4	55.7%	19.5	27.5	2.3
Total		178	167	93.9%	31.8	3.1	88.7

Intersection 4 Shields St/W Elizabeth St

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		Delay (min)
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	1	1	80.0%	3.1	6.4	0.1
	Through	6	12	196.7%	3.4	4.2	0.3
	Right Turn	9	9	102.2%	0.4	1.0	0.1
	Subtotal	16	22	136.3%	2.5	2.7	0.5
SB	Left Turn	4	4	87.5%	12.6	16.5	0.8
	Through	2	0	15.0%	0.0	0.0	0.0
	Right Turn	1	1	110.0%	0.0	0.0	0.0
	Subtotal	7	5	70.0%	10.4	15.5	0.8
EB	Left Turn	8	7	87.5%	29.2	31.0	3.9
	Through	112	140	125.0%	45.5	12.7	85.0
	Right Turn	2	2	100.0%	17.3	29.7	0.6
	Subtotal	122	149	122.1%	45.1	12.7	89.5
WB	Left Turn	3	2	66.7%	26.1	31.1	1.3
	Through	6	6	95.0%	37.4	28.2	3.7
	Right Turn	5	4	82.0%	0.7	1.1	0.1
	Subtotal	14	12	84.3%	28.1	18.7	5.1
Total		159	188	117.9%	38.3	10.2	95.9

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

Bicycle AM Peak

Intersection 5 Shields St/Lake St

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		Delay (min)
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	11	12	107.3%	6.7	10.4	1.2
	Through	52	67	128.5%	0.6	0.8	0.5
	Right Turn	63	79	124.8%	1.1	1.0	1.7
SB	Left Turn	1	1	80.0%	0.5	1.7	0.0
	Through	6	4	63.3%	5.1	8.1	0.5
	Right Turn	7	5	65.7%	5.6	7.9	0.5
EB	Left Turn						
	Through						
	Right Turn						
WB	Left Turn	8	7	90.0%	44.9	23.6	6.0
	Through	7	5	72.9%	7.2	7.8	0.8
	Right Turn	15	12	82.0%	34.7	21.4	6.8
Total		85	96	112.4%	5.4	2.6	9.0

Intersection 6 Shields St/Prospect

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		Delay (min)
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	41	54	131.0%	15.7	5.5	10.7
	Through	41	54	131.0%	15.7	5.5	10.7
	Right Turn	41	54	131.0%	15.7	5.5	10.7
SB	Left Turn	1	1	110.0%	5.9	9.7	0.1
	Through	13	9	71.5%	2.1	4.7	0.5
	Right Turn	14	10	74.3%	3.1	4.7	0.6
EB	Left Turn	22	25	113.2%	62.9	20.9	23.1
	Through	10	15	149.5%	85.8	36.8	14.3
	Right Turn	4	7	166.3%	55.8	36.8	3.7
WB	Left Turn	1	0	0.0%	0.0	0.0	0.0
	Through	1	0	0.0%	0.0	0.0	0.0
	Right Turn	1	0	0.0%	0.0	0.0	0.0
Total		92	132	143.7%	44.3	7.1	52.4

Intersection 8 City Park Ave/W Elizabeth St

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		Delay (min)
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	6	7	110.0%	16.0	13.1	1.6
	Through	27	29	105.6%	7.5	2.9	1.6
	Second Right	27	29	105.6%	7.5	2.9	1.6
SB	Left Turn	6	8	126.7%	17.4	15.0	1.7
	Through	2	3	135.0%	0.7	1.7	0.0
	Second Right	8	10	128.8%	12.4	13.9	1.8
EB	Left Turn	2	1	50.0%	0.2	0.7	0.0
	Through	93	116	124.5%	11.0	2.7	17.0
	Second Right	97	130	134.3%	10.8	2.5	17.0
WB	Left Turn	3	3	106.7%	4.0	7.0	0.2
	Through	6	5	88.3%	3.4	5.7	0.2
	Second Right	6	5	88.3%	3.4	5.7	0.2
Total		138	174	126.4%	10.3	2.6	20.6

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

Bicycle AM Peak

Intersection 9 Constitution Ave/W Elizabeth St

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		Delay (min)
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	1	1	60.0%	0.0	0.0	0.0
	Through	1	0	30.0%	0.0	0.0	0.0
	Right Turn	5	3	50.0%	2.1	1.8	0.2
	Subtotal	7	3	48.6%	2.1	1.8	0.2
SB	Left Turn	1	6	600.0%	17.6	10.8	0.3
	Through	1	6	560.0%	18.5	10.1	0.3
	Right Turn						
	Subtotal	2	23	1160.0%	20.1	8.1	0.6
EB	Left Turn	1	1	120.0%	2.0	5.4	0.0
	Through	62	61	98.5%	12.1	6.4	12.5
	Right Turn						
	Subtotal	63	62	98.9%	12.0	6.5	12.6
WB	Left Turn						
	Through	3	3	103.3%	1.2	2.6	0.1
	Right Turn						
	Subtotal	3	3	103.3%	1.2	2.6	0.1
Total		75	92	122.7%	12.72	4.4	13.4

Intersection 11 Taft Hill Rd/W Elizabeth St

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		Delay (min)
			Average	Percent	Average	Std. Dev.	
NB	Left Turn						
	Through	4	4	90.0%	11.9	16.8	0.8
	Right Turn	2	2	85.0%	8.4	14.5	0.3
	Subtotal	6	5	88.3%	13.8	12.8	1.1
SB	Left Turn	2	2	90.0%	4.7	13.7	0.2
	Through	1	1	50.0%	0.0	0.0	0.0
	Right Turn						
	Subtotal	3	2	76.7%	4.7	13.7	0.2
EB	Left Turn						
	Through	57	57	99.3%	35.6	9.4	33.8
	Right Turn						
	Subtotal	57	57	99.3%	35.6	9.4	33.8
WB	Left Turn	2	1	25.0%	4.6	14.4	0.2
	Through						
	Right Turn	1	2	150.0%	0.7	1.4	0.0
	Subtotal	3	2	66.7%	3.7	9.5	0.2
Total		69	66	95.9%	30.7	7.5	35.2

Intersection 12 Overland Trail/W Elizabeth St

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		Delay (min)
			Average	Percent	Average	Std. Dev.	
NB	Left Turn						
	Through	14	15	105.0%	0.0	0.1	0.0
	Right Turn						
	Subtotal	14	15	105.0%	0.0	0.1	0.0
SB	Left Turn						
	Through	5	5	100.0%	0.0	0.0	0.0
	Right Turn						
	Subtotal	5	5	100.0%	0.0	0.0	0.0
EB	Left Turn	1	1	120.0%	0.8	1.7	0.0
	Through						
	Right Turn						
	Subtotal	1	1	120.0%	0.8	1.7	0.0
WB	Left Turn	1	0	0.0%	0.0	0.0	0.0
	Through	1	1	120.0%	3.9	9.7	0.1
	Right Turn	3	0	0.0%	0.0	0.0	0.0
	Subtotal	5	1	24.0%	3.9	9.7	0.1
Total		25	22	88.4%	0.8	1.7	0.1

PM PEAK HOUR



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

Bicycle PM Peak

Intersection 2 Shields St/W Laurel St

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
			Average	Percent	Average	Std. Dev.	
NB	Left Turn						
	Through	3	4	126.7%	9.6	11.6	0.5
	Right Turn	5	4	82.0%	0.5	0.9	0.0
	Subtotal	8	8	98.8%	6.8	7.9	0.5
SB	Left Turn	1	0	0.0%	0.0	0.0	0.0
	Through	1	0	0.0%	0.0	0.0	0.0
	Right Turn						
	Subtotal	2	0	0.0%	0.0	0.0	0.0
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	6	5	81.7%	31.8	32.9	3.2
	Through						
	Right Turn	7	7	95.7%	13.4	13.6	1.6
	Subtotal	13	12	89.2%	28.2	20.3	4.7
Total		23	20	84.8%	17.7	9.4	5.3

Intersection 3 Shields St/W Plum St

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	1	2	240.0%	143.0	171.5	2.4
	Through	7	5	71.4%	3.4	6.3	0.4
	Right Turn	3	1	26.7%	1.7	5.3	0.1
	Subtotal	11	8	74.5%	87.2	114.6	2.9
SB	Left Turn						
	Through	5	3	64.0%	1.2	2.5	0.1
	Right Turn	2	2	90.0%	0.7	1.5	0.0
	Subtotal	7	5	71.4%	1.5	1.7	0.1
EB	Left Turn	1	2	150.0%	9.9	21.9	0.2
	Through	36	35	97.5%	37.2	11.8	22.3
	Right Turn						
	Subtotal	37	37	98.9%	36.2	11.9	22.5
WB	Left Turn	2	2	100.0%	25.9	53.7	0.9
	Through	119	118	98.7%	45.6	17.9	90.4
	Right Turn						
	Subtotal	121	120	98.8%	46.4	20.2	91.2
Total		176	169	96.2%	43.81	11.0	116.68

Intersection 4 Shields St/W Elizabeth St

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	2	2	85.0%	24.1	39.5	1
	Through	9	5	55.6%	3.4	6.3	0.5
	Right Turn	5	4	82.0%	0.9	2.7	0.1
	Subtotal	16	11	67.5%	18.7	31.3	1.4
SB	Left Turn	1	1	120.0%	26.8	47.5	0.4
	Through	3	2	60.0%	1.1	1.9	0.1
	Right Turn	3	2	76.7%	1.3	2.2	0.1
	Subtotal	7	5	75.7%	25.8	47.7	0.6
EB	Left Turn	1	1	140.0%	26.8	35.6	0.4
	Through	12	12	95.8%	47.0	19.0	9.4
	Right Turn	1	1	130.0%	1.7	2.6	0.0
	Subtotal	14	14	101.4%	43.0	16.9	9.9
WB	Left Turn	3	3	96.7%	19.3	26.4	1.0
	Through	102	101	98.9%	44.8	5.5	76.1
	Right Turn	1	1	100.0%	0.0	0.0	0.0
	Subtotal	106	105	98.9%	43.9	5.2	77.1
Total		143	135	94.5%	40.1	5.4	88.9

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

Bicycle PM Peak

Intersection 5 Shields St/Lake St

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
			Average	Percent	Average	Std. Dev.	
NB	Left Turn						
	Through	9	5	55.6%	9.2	12.1	1.4
	Right Turn						
	Subtotal	9	5	55.6%	9.2	12.1	1.4
SB	Left Turn						
	Through	7	6	90.0%	8.0	13.6	0.9
	Right Turn						
	Subtotal	7	6	90.0%	8.0	13.6	0.9
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	8	7	86.3%	40.8	26.6	5.4
	Through						
	Right Turn	7	6	90.0%	5.3	8.7	0.6
	Subtotal	15	13	88.0%	27.6	18.7	6.1
Total		31	25	79.0%	17.8	9.9	8.4

Intersection 6 Shields St/Prospect

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	1	0	0.0%	0.0	0.0	0
	Through	25	22	86.0%	25.8	10.5	10.7
	Right Turn	1	2	150.0%	0.0	0.0	0.0
	Subtotal	27	23	85.2%	24.7	10.1	10.7
SB	Left Turn						
	Through	15	13	84.7%	20.0	16.3	5.0
	Right Turn						
	Subtotal	15	13	84.7%	20.0	16.3	5.0
EB	Left Turn	9	7	77.8%	48.4	36.2	7.3
	Through	2	2	95.0%	27.5	31.6	0.9
	Right Turn						
	Subtotal	11	9	80.9%	50.1	28.8	8.2
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		53	45	84.2%	28.8	8.6	23.9

Intersection 8 City Park Ave/W Elizabeth St

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	3	3	90.0%	5.4	11.1	0
	Through	9	8	93.3%	14.9	6.1	2.2
	Right Turn	4	5	115.0%	2.7	4.7	0.2
	Subtotal	16	16	98.1%	14.5	6.7	2.7
SB	Left Turn	5	5	98.0%	15.8	14.2	1.3
	Through	8	9	106.3%	0.4	0.4	0.0
	Right Turn	1	1	60.0%	1.0	1.7	0.0
	Subtotal	14	14	100.0%	7.9	6.5	1.4
EB	Left Turn	1	1	130.0%	8.2	15.1	0.1
	Through	29	33	113.1%	16.4	5.0	7.9
	Right Turn	1	1	110.0%	0.3	0.9	0.0
	Subtotal	31	35	113.5%	16.4	5.3	8.1
WB	Left Turn	10	11	110.0%	16.5	12.6	2.8
	Through	88	86	97.4%	11.7	4.9	17.2
	Right Turn	15	14	92.7%	5.1	6.4	1.3
	Subtotal	113	111	97.9%	11.7	4.9	21.2
Total		174	176	100.9%	12.8	2.8	33.4

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

Bicycle PM Peak

Intersection 9 Constitution Ave/W Elizabeth St

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	2	2	85.0%	0.0	0.0	0.0
	Through	2	2	120.0%	1.9	2.1	0.1
	Right Turn	2	2	120.0%	1.9	2.1	0.1
	Subtotal	4	4	102.5%	1.5	1.6	0.1
SB	Left Turn	3	2	80.0%	5.5	10.4	0.3
	Through	12	13	108.3%	18.4	12.9	3.7
	Right Turn	11	12	104.5%	2.7	7.1	0.5
	Subtotal	26	27	103.5%	10.5	5.9	4.5
EB	Left Turn	1	1	90.0%	5.9	17.6	0.1
	Through	38	41	106.6%	14.0	3.0	8.9
	Right Turn	1	1	90.0%	5.9	17.6	0.1
	Subtotal	39	41	106.2%	14.3	2.6	9.0
WB	Left Turn	69	68	98.7%	8.3	3.7	9.6
	Through	4	3	80.0%	2.8	8.4	0.2
	Right Turn	4	3	80.0%	2.8	8.4	0.2
	Subtotal	73	71	97.7%	8.3	3.7	9.7
Total		142	144	101.2%	10.1	2.6	23.3

Intersection 11 Taft Hill Rd/W Elizabeth St

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	1	1	70.0%	5.9	12.5	0
	Through	2	1	50.0%	10.7	17.6	0.4
	Right Turn	2	2	80.0%	9.7	14.2	0.3
	Subtotal	5	3	66.0%	14.5	16.2	0.8
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn	47	48	101.1%	32.6	9.5	25.5
	Through	47	48	101.1%	32.6	9.5	25.5
	Right Turn	47	48	101.1%	32.6	9.5	25.5
	Subtotal	47	48	101.1%	32.6	9.5	25.5
WB	Left Turn	47	45	94.7%	44.6	12.3	34.9
	Through	1	2	150.0%	1.6	5.1	0.0
	Right Turn	1	2	150.0%	1.6	5.1	0.0
	Subtotal	48	46	95.8%	44.5	12.4	35.0
Total		100	97	96.8%	36.4	7.1	61.3

Intersection 12 Overland Trail/W Elizabeth St

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	44	44	99.8%	0.8	0.6	0.6
	Through	4	3	82.5%	0.0	0.0	0.0
	Right Turn	4	3	82.5%	0.0	0.0	0.0
	Subtotal	48	47	98.3%	0.7	0.6	0.6
SB	Left Turn	29	29	100.0%	0.1	0.2	0.0
	Through	29	29	100.0%	0.1	0.2	0.0
	Right Turn	29	29	100.0%	0.1	0.2	0.0
	Subtotal	29	29	100.0%	0.1	0.2	0.0
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	9	7	74.4%	6.4	2.4	1.0
	Through	3	3	83.3%	3.3	3.6	0.2
	Right Turn	3	3	83.3%	3.3	3.6	0.2
	Subtotal	12	9	76.7%	6.6	2.3	1.1
Total		89	85	96.0%	1.3	0.7	1.7

CROSSWALK INTERSECTION DELAY



AM PEAK HOUR



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

Crosswalk AM Peak

Shields St/W Laurel St

Demand Volume (pph)	Served Volume (pph)		Total Delay (sec/person)		Total Person Delay (min)
	Average	Percent	Average	Std. Dev.	
37	34	91.4%	46.2	8.0	26.0

Shields St/W Plum St

Demand Volume (pph)	Served Volume (pph)		Total Delay (sec/person)		Total Person Delay (min)
	Average	Percent	Average	Std. Dev.	
106	107	101.3%	51.7	6.6	92.6

Shields St/W Elizabeth St

Demand Volume (pph)	Served Volume (pph)		Total Delay (sec/person)		Total Person Delay (min)
	Average	Percent	Average	Std. Dev.	
90	90	100.3%	53.0	3.9	79.7

Shields St/Lake St

Demand Volume (pph)	Served Volume (pph)		Total Delay (sec/person)		Total Person Delay (min)
	Average	Percent	Average	Std. Dev.	
54	54	99.3%	48.6	10.0	43.4

Shields St/Prospect

Demand Volume (pph)	Served Volume (pph)		Total Delay (sec/person)		Total Person Delay (min)
	Average	Percent	Average	Std. Dev.	
68	66	96.6%	51.8	10.8	56.8

Ped Crossing/W Elizabeth St

Demand Volume (pph)	Served Volume (pph)		Total Delay (sec/person)		Total Person Delay (min)
	Average	Percent	Average	Std. Dev.	
1	1	90.0%	0.0	0.0	0.0

City Park Ave/W Elizabeth St

Demand Volume (pph)	Served Volume (pph)		Total Delay (sec/person)		Total Person Delay (min)
	Average	Percent	Average	Std. Dev.	
36	36	101.1%	19.9	5.7	12.1

Constitution Ave/W Elizabeth St

Demand Volume (pph)	Served Volume (pph)		Total Delay (sec/person)		Total Person Delay (min)
	Average	Percent	Average	Std. Dev.	
9	9	103.3%	16.1	13.1	2.5

Ped Signal/W Elizabeth St

Demand Volume (pph)	Served Volume (pph)		Total Delay (sec/person)		Total Person Delay (min)
	Average	Percent	Average	Std. Dev.	
2	2	90.0%	10.4	15.7	0.3

Taft Hill Rd/W Elizabeth St

Demand Volume (pph)	Served Volume (pph)		Total Delay (sec/person)		Total Person Delay (min)
	Average	Percent	Average	Std. Dev.	
17	16	91.8%	33.8	8.8	8.8

Overland Trail/W Elizabeth St

Demand Volume (pph)	Served Volume (pph)		Total Delay (sec/person)		Total Person Delay (min)
	Average	Percent	Average	Std. Dev.	
2	2	100.0%	0.5	1.6	0.0

PM PEAK HOUR



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

Crosswalk PM Peak

Shields St/W Laurel St

Demand Volume (pph)	Served Volume (pph)		Total Delay (sec/person)		Total Person Delay (min)
	Average	Percent	Average	Std. Dev.	
64	62	96.9%	60.8	9.9	62.8

Shields St/W Plum St

Demand Volume (pph)	Served Volume (pph)		Total Delay (sec/person)		Total Person Delay (min)
	Average	Percent	Average	Std. Dev.	
157	152	96.5%	57.7	10.6	145.6

Shields St/W Elizabeth St

Demand Volume (pph)	Served Volume (pph)		Total Delay (sec/person)		Total Person Delay (min)
	Average	Percent	Average	Std. Dev.	
162	159	98.3%	57.0	9.4	151.2

Shields St/Lake St

Demand Volume (pph)	Served Volume (pph)		Total Delay (sec/person)		Total Person Delay (min)
	Average	Percent	Average	Std. Dev.	
25	23	93.6%	52.7	40.3	20.5

Shields St/Prospect

Demand Volume (pph)	Served Volume (pph)		Total Delay (sec/person)		Total Person Delay (min)
	Average	Percent	Average	Std. Dev.	
71	71	100.4%	68.8	13.1	81.7

Ped Crossing/W Elizabeth St

Demand Volume (pph)	Served Volume (pph)		Total Delay (sec/person)		Total Person Delay (min)
	Average	Percent	Average	Std. Dev.	
15	16	105.3%	1.0	1.6	0.3

City Park Ave/W Elizabeth St

Demand Volume (pph)	Served Volume (pph)		Total Delay (sec/person)		Total Person Delay (min)
	Average	Percent	Average	Std. Dev.	
239	236	98.5%	29.4	2.7	115.3

Constitution Ave/W Elizabeth St

Demand Volume (pph)	Served Volume (pph)		Total Delay (sec/person)		Total Person Delay (min)
	Average	Percent	Average	Std. Dev.	
40	40	100.0%	21.1	5.6	14.1

Ped Signal/W Elizabeth St

Demand Volume (pph)	Served Volume (pph)		Total Delay (sec/person)		Total Person Delay (min)
	Average	Percent	Average	Std. Dev.	
4	4	87.5%	21.6	16.1	1.3

Taft Hill Rd/W Elizabeth St

Demand Volume (pph)	Served Volume (pph)		Total Delay (sec/person)		Total Person Delay (min)
	Average	Percent	Average	Std. Dev.	
50	51	101.0%	44.8	5.3	37.7

Overland Trail/W Elizabeth St

Demand Volume (pph)	Served Volume (pph)		Total Delay (sec/person)		Total Person Delay (min)
	Average	Percent	Average	Std. Dev.	
12	11	90.0%	0.8	1.4	0.2

ADDITIONAL VALIDATION AND TRAVEL TIME DATA



PM Peak Green Time Validation using Modeled and Measured Phase Green Times by Intersection

Shields/Prospect

Phase	Measured	Modeled	Delta	% Delta
1	12	10	-2	17%
2	46	49	3	7%
3	12	11	-1	8%
4	28	29	1	4%
5	16	12	-4	25%
6	42	47	5	12%
7	8	7	-1	13%
8	32	31	-1	3%

Shields/Lake

Phase	Measured	Modeled	Delta	% Delta
2	92	91	-1	1%
5	4	6	2	50%
6	86	89	3	3%
8	17	16	-1	6%

Shields/Elizabeth

Phase	Measured	Modeled	Delta	% Delta
1	17	13	-4	24%
2	42	45	3	7%
4	20	20	0	0%
5	1	4	3	300%
6	62	60	-2	3%
8	19	22	3	16%

Shields/Plum

Phase	Measured	Modeled	Delta	% Delta
2	85	82	-3	4%
4	24	25	1	4%
6	85	82	-3	4%
8	24	25	1	4%

Shields/Laurel

Phase	Measured	Modeled	Delta	% Delta
2	85	81	-4	5%
5	4	7	3	75%
6	78	76	-2	3%
8	24	27	3	13%

Elizabeth/City Park

Phase	Measured	Modeled	Delta	% Delta
2	17.5	17	-0.5	3%
4	32	32	0	0%
6	17.5	17	-0.5	3%
8	32	32	0	0%

Elizabeth/Constitution

Phase	Measured	Modeled	Delta	% Delta
2	9.5	10	0.5	5%
4	40	43	3	8%
6	9.5	10	0.5	5%
8	40	43	3	8%

Elizabeth/Taft Hill

Phase	Measured	Modeled	Delta	% Delta
1	8	7	-1	13%
2	36.5	39	2.5	7%
3	7	7	0	0%
4	24	24	0	0%
5	5	6	1	20%
6	40.5	42	1.5	4%
7	6	6	0	0%
8	25	25	0	0%

Existing Peak Hour Segment Vehicle Travel Time Validation

Roadway	Roadway Segment	Period	Travel Time		Absolute Difference	Percent Difference
			VISSIM	Blue Tooth		
Shields	NB Prospect to Mulberry	AM	147.8	N/A	N/A	N/A
		PM	175.1	156	19.1	12%
	SB Mulberry to Prospect	AM	139.0	N/A	N/A	N/A
		PM	175.4	180	-4.6	-3%
Elizabeth	EB Taft Hill to Constitution	AM	65.4	54	11.4	21%
		PM	68.1	55	13.1	24%
	EB Constitution to Shields	AM	101.4	86	15.4	18%
		PM	122.1	112	10.1	9%
	WB Shields to Constitution	AM	71.8	67	4.8	7%
		PM	80.6	73	7.6	10%
	WB Constitution to Taft Hill	AM	96.8	71	25.8	36%
		PM	104.4	86	18.4	21%

Transit Travel Time along Elizabeth St by Segment		
Segment	Travel Time including dwell time (sec)	
	AM	PM
WB Shields City Park	42.1	41.9
WB City Park to Taft	211.4	205.1
WB Taft Hill to Overland	265.4	265.0
WB Shields to Overland	518.9	511.9
EB Overland to Taft Hill	249.2	254.0
EB Taft Hill to City Park	221.5	218.7
EB City Park to Shields	110.6	110.7
EB Overland to Shields	581.4	583.5