APPENDIX C

TRAFFIC DATA

FEHR PEERS

TECHNICAL TRANSPORTATION APPENDIX

CHILDREN'S HOSPITAL AND RESEARCH CENTER OAKLAND DRAFT EIR

May 2014

WC12-2940

Appendix A: Intersection Count Data Sheets

Appendix B: LOS Calculation Worksheets – Existing Conditions

Appendix C: LOS Calculation Worksheets – 2020 No Project Conditions

Appendix D: LOS Calculation Worksheets – 2035 No Project Conditions

Appendix E: Transportation Impact Analysis Assumptions Memorandum

Appendix F: LOS Calculation Worksheets – Existing Plus Phase 1 Conditions

Appendix G: LOS Calculation Worksheets – Existing Plus Phase 2 Conditions

Appendix H: LOS Calculation Worksheets – 2020 Plus Phase 1 Conditions

Appendix I: LOS Calculation Worksheets – 2020 Plus Phase 2 Conditions

Appendix J: LOS Calculation Worksheets – 2035 Plus Phase 1 Conditions

Appendix K: LOS Calculation Worksheets – 2035 Plus Phase 2 Conditions

Appendix L: CMP Analysis Calculations

Appendix M: Queuing Analysis Summary

Appendix N: Collisions Analysis Summary

Appendix O: LOS Calculation Worksheets – Dover Street Closure Conditions

Appendix A

Intersection Count Data Sheets

FEHR PEERS

ALL TRAFFIC DATA

City of Oakland
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7519-001 Martin Luther King Jr Way-55th Street.ppd
Date : 9/19/2013

Unshifted Count = All Vehicles

	Martin Luther King Jr Way Southbound					55th Street Westbound					Martin Luther King Jr Way Northbound					55th Street Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
07:00	10	124	1	0	135	5	14	5	0	24	12	133	10	4	159	1	17	30	0	48	366	4
07:15	6	224	2	1	233	7	19	9	0	35	11	220	12	1	244	2	26	37	0	65	577	2
07:30	11	249	3	1	264	13	26	9	0	48	26	241	9	0	276	1	33	32	0	66	654	1
07:45	15	283	4	1	303	10	30	11	0	51	28	355	10	3	396	5	33	62	0	100	850	4
Total	42	880	10	3	935	35	89	34	0	158	77	949	41	8	1075	9	109	161	0	279	2447	11
08:00	8	274	8	2	292	12	47	13	0	72	40	319	17	6	382	5	40	51	0	96	842	8
08:15	18	330	9	0	357	12	58	11	0	81	31	324	11	3	369	3	55	63	0	121	928	3
08:30	9	339	2	0	350	17	60	21	0	98	25	330	8	0	363	4	44	50	0	98	909	0
08:45	15	296	8	0	319	13	52	12	0	77	31	367	13	4	415	1	31	55	0	87	898	4
Total	50	1239	27	2	1318	54	217	57	0	328	127	1340	49	13	1529	13	170	219	0	402	3577	15
15:00	14	260	4	0	278	9	40	8	0	57	41	272	16	4	333	1	39	41	0	81	749	4
15:15	15	289	5	2	311	15	46	16	0	77	38	284	22	4	348	5	41	36	0	82	818	6
15:30	24	299	3	1	327	20	27	15	0	62	48	297	16	3	364	0	35	44	0	79	832	4
15:45	15	302	4	0	321	13	34	13	0	60	34	317	18	3	372	4	33	41	0	78	831	3
Total	68	1150	16	3	1237	57	147	52	0	256	161	1170	72	14	1417	10	148	162	0	320	3230	17
16:00	10	286	2	0	298	10	31	10	0	51	43	300	12	2	357	5	35	41	0	81	787	2
16:15	16	341	9	0	366	7	30	7	0	44	53	321	15	3	392	3	33	34	0	70	872	3
16:30	19	308	5	0	332	10	35	9	0	54	54	353	11	1	419	4	42	43	0	89	894	1
16:45	18	335	3	1	357	6	38	10	0	54	48	403	16	3	470	4	63	36	0	103	984	4
Total	63	1270	19	1	1353	33	134	36	0	203	198	1377	54	9	1638	16	173	154	0	343	3537	10
17:00	28	316	1	1	346	15	30	8	0	53	49	371	24	7	451	2	72	36	0	110	960	8
17:15	23	321	5	0	349	9	37	13	0	59	59	390	23	0	472	4	51	45	0	100	980	0
17:30	15	322	5	0	342	19	32	11	0	62	41	414	24	3	482	2	61	44	0	107	993	3
17:45	26	313	3	0	342	10	29	8	0	47	49	371	19	1	440	3	52	39	0	94	923	1
Total	92	1272	14	1	1379	53	128	40	0	221	198	1546	90	11	1845	11	236	164	0	411	3856	12
Grand Total	315	5811	86	10	6222	232	715	219	0	1166	761	6382	306	55	7504	59	836	860	0	1755	16647	65
Apprch %	5.1%	93.4%	1.4%	0.2%		19.9%	61.3%	18.8%	0.0%		10.1%	85.0%	4.1%	0.7%		3.4%	47.6%	49.0%	0.0%			
Total %	1.9%	34.9%	0.5%	0.1%	37.4%	1.4%	4.3%	1.3%	0.0%	7.0%	4.6%	38.3%	1.8%	0.3%	45.1%	0.4%	5.0%	5.2%	0.0%	10.5%	100.0%	

AM PEAK HOUR	Martin Luther King Jr Way Southbound					55th Street Westbound					Martin Luther King Jr Way Northbound					55th Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 08:00 to 09:00																					
Peak Hour For Entire Intersection Begins at 08:00																					
08:00	8	274	8	2	292	12	47	13	0	72	40	319	17	6	382	5	40	51	0	96	842
08:15	18	330	9	0	357	12	58	11	0	81	31	324	11	3	369	3	55	63	0	121	928
08:30	9	339	2	0	350	17	60	21	0	98	25	330	8	0	363	4	44	50	0	98	909
08:45	15	296	8	0	319	13	52	12	0	77	31	367	13	4	415	1	31	55	0	87	898
Total Volume	50	1239	27	2	1318	54	217	57	0	328	127	1340	49	13	1529	13	170	219	0	402	3577
% App Total	3.8%	94.0%	2.0%	0.2%		16.5%	66.2%	17.4%	0.0%		8.3%	87.6%	3.2%	0.9%		3.2%	42.3%	54.5%	0.0%		
PHF	.694	.914	.750	.250	.923	.794	.904	.679	.000	.837	.794	.913	.721	.542	.921	.650	.773	.869	.000	.831	.964

PM PEAK HOUR	Martin Luther King Jr Way Southbound					55th Street Westbound					Martin Luther King Jr Way Northbound					55th Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:45 to 17:45																					
Peak Hour For Entire Intersection Begins at 16:45																					
16:45	18	335	3	1	357	6	38	10	0	54	48	403	16	3	470	4	63	36	0	103	984
17:00	28	316	1	1	346	15	30	8	0	53	49	371	24	7	451	2	72	36	0	110	960
17:15	23	321	5	0	349	9	37	13	0	59	59	390	23	0	472	4	51	45	0	100	980
17:30	15	322	5	0	342	19	32	11	0	62	41	414	24	3	482	2	61	44	0	107	993
Total Volume	84	1294	14	2	1394	49	137	42	0	228	197	1578	87	13	1875	12	247	161	0	420	3917
% App Total	6.0%	92.8%	1.0%	0.1%		21.5%	60.1%	18.4%	0.0%		10.5%	84.2%	4.6%	0.7%		2.9%	58.8%	38.3%	0.0%		
PHF	.750	.966	.700	.500	.976	.645	.901	.808	.000	.919	.835	.953	.906	.464	.973	.750	.858	.894	.000	.955	.986

ALL TRAFFIC DATA

City of Oakland
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : C:\Users\Sac - 3\Desktop\NDS\ITMs\13-7519 Oakland\raw\13
Date : 9/19/2013

Unshifted Count = All Vehicles

	Dover Street Southbound					55th Street Westbound					Dover Street Northbound					55th Street Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
07:00	1	0	1	0	2	1	23	2	0	26	0	0	2	0	2	2	36	0	0	38	68	0
07:15	5	1	1	0	7	7	31	1	0	39	1	0	2	0	3	0	40	0	0	40	89	0
07:30	4	2	2	0	8	3	39	0	0	42	4	1	3	0	8	2	55	1	0	58	116	0
07:45	2	1	1	0	4	5	42	0	0	47	1	1	2	0	4	1	55	2	0	58	113	0
Total	12	4	5	0	21	16	135	3	0	154	6	2	9	0	17	5	186	3	0	194	386	0
08:00	3	1	5	0	9	4	65	0	0	69	2	1	6	0	9	2	64	2	0	68	155	0
08:15	1	1	5	0	7	10	71	2	0	83	4	2	3	0	9	9	70	2	0	81	180	0
08:30	3	1	5	0	9	3	85	2	0	90	1	1	1	0	3	3	63	1	0	67	169	0
08:45	1	3	6	0	10	3	75	2	0	80	0	4	1	0	5	4	52	1	0	57	152	0
Total	8	6	21	0	35	20	296	6	0	322	7	8	11	0	26	18	249	6	0	273	656	0
15:00	2	2	2	0	6	2	47	1	0	50	2	0	7	0	9	0	62	0	0	62	127	0
15:15	4	4	2	0	10	1	70	1	0	72	3	4	8	0	15	4	63	3	0	70	167	0
15:30	3	0	7	0	10	1	49	1	0	51	1	1	5	0	7	5	68	4	0	77	145	0
15:45	5	2	6	0	13	3	50	1	0	54	2	5	3	0	10	3	59	4	0	66	143	0
Total	14	8	17	0	39	7	216	4	0	227	8	10	23	0	41	12	252	11	0	275	582	0
16:00	1	0	2	0	3	6	51	3	0	60	3	1	2	0	6	2	57	2	0	61	130	0
16:15	3	3	5	0	11	0	36	1	0	37	5	0	5	0	10	5	61	1	0	67	125	0
16:30	4	4	3	0	11	3	40	1	0	44	3	6	3	0	12	3	61	1	0	65	132	0
16:45	2	3	9	0	14	0	40	1	0	41	2	0	9	0	11	2	98	0	0	100	166	0
Total	10	10	19	0	39	9	167	6	0	182	13	7	19	0	39	12	277	4	0	293	553	0
17:00	1	3	3	0	7	2	38	3	0	43	5	4	5	0	14	5	112	6	0	123	187	0
17:15	5	0	9	0	14	3	45	4	0	52	4	4	4	0	12	4	86	2	0	92	170	0
17:30	3	3	9	0	15	1	51	1	0	53	1	4	4	0	9	6	94	1	0	101	178	0
17:45	2	3	4	0	9	4	42	0	0	46	1	1	3	0	5	1	97	1	0	99	159	0
Total	11	9	25	0	45	10	176	8	0	194	11	13	16	0	40	16	389	10	0	415	694	0
Grand Total	55	37	87	0	179	62	990	27	0	1079	45	40	78	0	163	63	1353	34	0	1450	2871	0
Apprch %	30.7%	20.7%	48.6%	0.0%		5.7%	91.8%	2.5%	0.0%		27.6%	24.5%	47.9%	0.0%		4.3%	93.3%	2.3%	0.0%			
Total %	1.9%	1.3%	3.0%	0.0%	6.2%	2.2%	34.5%	0.9%	0.0%	37.6%	1.6%	1.4%	2.7%	0.0%	5.7%	2.2%	47.1%	1.2%	0.0%	50.5%	100.0%	

AM PEAK HOUR	Dover Street Southbound					55th Street Westbound					Dover Street Northbound					55th Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 08:00 to 09:00																					
Peak Hour For Entire Intersection Begins at 08:00																					
08:00	3	1	5	0	9	4	65	0	0	69	2	1	6	0	9	2	64	2	0	68	155
08:15	1	1	5	0	7	10	71	2	0	83	4	2	3	0	9	9	70	2	0	81	180
08:30	3	1	5	0	9	3	85	2	0	90	1	1	1	0	3	3	63	1	0	67	169
08:45	1	3	6	0	10	3	75	2	0	80	0	4	1	0	5	4	52	1	0	57	152
Total Volume	8	6	21	0	35	20	296	6	0	322	7	8	11	0	26	18	249	6	0	273	656
% App Total	22.9%	17.1%	60.0%	0.0%		6.2%	91.9%	1.9%	0.0%		26.9%	30.8%	42.3%	0.0%		6.6%	91.2%	2.2%	0.0%		
PHF	.667	.500	.875	.000	.875	.500	.871	.750	.000	.894	.438	.500	.458	.000	.722	.500	.889	.750	.000	.843	.911

PM PEAK HOUR	Dover Street Southbound					55th Street Westbound					Dover Street Northbound					55th Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:45 to 17:45																					
Peak Hour For Entire Intersection Begins at 16:45																					
16:45	2	3	9	0	14	0	40	1	0	41	2	0	9	0	11	2	98	0	0	100	166
17:00	1	3	3	0	7	2	38	3	0	43	5	4	5	0	14	5	112	6	0	123	187
17:15	5	0	9	0	14	3	45	4	0	52	4	4	4	0	12	4	86	2	0	92	170
17:30	3	3	9	0	15	1	51	1	0	53	1	4	4	0	9	6	94	1	0	101	178
Total Volume	11	9	30	0	50	6	174	9	0	189	12	12	22	0	46	17	390	9	0	416	701
% App Total	22.0%	18.0%	60.0%	0.0%		3.2%	92.1%	4.8%	0.0%		26.1%	26.1%	47.8%	0.0%		4.1%	93.8%	2.2%	0.0%		
PHF	.550	.750	.833	.000	.833	.500	.853	.563	.000	.892	.600	.750	.611	.000	.821	.708	.871	.375	.000	.846	.937

ALL TRAFFIC DATA

City of Oakland
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : C:\Users\Sac - 3\Desktop\NDS\ITMs\13-7519 Oakland\raw\13
Date : 9/19/2013

Unshifted Count = All Vehicles

	Shattuck Avenue Southbound					55th Street Westbound					Shattuck Avenue Northbound					55th Street Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
07:00	3	50	3	0	56	3	18	0	0	21	3	47	2	0	52	4	28	6	0	38	167	0
07:15	6	68	5	0	79	1	26	4	0	31	3	78	3	0	84	4	37	2	0	43	237	0
07:30	1	98	3	0	102	3	36	3	0	42	3	83	9	0	95	11	48	7	0	66	305	0
07:45	7	141	5	0	153	1	33	4	0	38	5	94	3	0	102	8	41	8	0	57	350	0
Total	17	357	16	0	390	8	113	11	0	132	14	302	17	0	333	27	154	23	0	204	1059	0
08:00	7	124	9	0	140	4	51	8	0	63	7	105	4	0	116	11	55	7	0	73	392	0
08:15	3	146	4	0	153	5	71	6	0	82	7	88	7	0	102	18	57	7	0	82	419	0
08:30	4	144	10	0	158	6	65	8	0	79	9	113	9	0	131	13	37	13	0	63	431	0
08:45	11	130	5	0	146	10	63	9	0	82	5	124	4	0	133	8	38	13	0	59	420	0
Total	25	544	28	0	597	25	250	31	0	306	28	430	24	0	482	50	187	40	0	277	1662	0
15:00	8	137	9	0	154	7	43	2	0	52	4	99	6	0	109	5	59	8	0	72	387	0
15:15	4	111	11	0	126	10	41	7	0	58	12	92	11	0	115	8	48	10	0	66	365	0
15:30	10	131	8	0	149	3	33	3	0	39	5	128	8	0	141	16	53	9	0	78	407	0
15:45	10	131	8	0	149	2	31	8	0	41	7	120	11	0	138	9	51	12	0	72	400	0
Total	32	510	36	0	578	22	148	20	0	190	28	439	36	0	503	38	211	39	0	288	1559	0
16:00	12	107	7	0	126	4	40	6	0	50	8	85	4	0	97	20	39	6	0	65	338	0
16:15	5	128	8	0	141	8	28	12	0	48	4	112	8	0	124	7	60	3	0	70	383	0
16:30	5	139	14	0	158	9	26	7	0	42	11	115	11	0	137	10	56	6	0	72	409	0
16:45	4	126	2	0	132	4	27	13	0	44	10	123	11	0	144	17	72	14	0	103	423	0
Total	26	500	31	0	557	25	121	38	0	184	33	435	34	0	502	54	227	29	0	310	1553	0
17:00	7	134	7	0	148	6	32	5	0	43	3	122	9	0	134	16	90	11	0	117	442	0
17:15	4	133	4	0	141	5	42	8	0	55	6	144	2	0	152	19	60	7	0	86	434	0
17:30	3	137	11	0	151	1	33	10	0	44	8	134	11	0	153	18	70	11	0	99	447	0
17:45	7	133	6	0	146	6	25	4	0	35	8	128	6	0	142	16	68	6	0	90	413	0
Total	21	537	28	0	586	18	132	27	0	177	25	528	28	0	581	69	288	35	0	392	1736	0
Grand Total	121	2448	139	0	2708	98	764	127	0	989	128	2134	139	0	2401	238	1067	166	0	1471	7569	0
Apprch %	4.5%	90.4%	5.1%	0.0%		9.9%	77.2%	12.8%	0.0%		5.3%	88.9%	5.8%	0.0%		16.2%	72.5%	11.3%	0.0%			
Total %	1.6%	32.3%	1.8%	0.0%	35.8%	1.3%	10.1%	1.7%	0.0%	13.1%	1.7%	28.2%	1.8%	0.0%	31.7%	3.1%	14.1%	2.2%	0.0%	19.4%	100.0%	

AM PEAK HOUR	Shattuck Avenue Southbound					55th Street Westbound					Shattuck Avenue Northbound					55th Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 08:00 to 09:00																					
Peak Hour For Entire Intersection Begins at 08:00																					
08:00	7	124	9	0	140	4	51	8	0	63	7	105	4	0	116	11	55	7	0	73	392
08:15	3	146	4	0	153	5	71	6	0	82	7	88	7	0	102	18	57	7	0	82	419
08:30	4	144	10	0	158	6	65	8	0	79	9	113	9	0	131	13	37	13	0	63	431
08:45	11	130	5	0	146	10	63	9	0	82	5	124	4	0	133	8	38	13	0	59	420
Total Volume	25	544	28	0	597	25	250	31	0	306	28	430	24	0	482	50	187	40	0	277	1662
% App Total	4.2%	91.1%	4.7%	0.0%		8.2%	81.7%	10.1%	0.0%		5.8%	89.2%	5.0%	0.0%		18.1%	67.5%	14.4%	0.0%		
PHF	.568	.932	.700	.000	.945	.625	.880	.861	.000	.933	.778	.867	.667	.000	.906	.694	.820	.769	.000	.845	.964

PM PEAK HOUR	Shattuck Avenue Southbound					55th Street Westbound					Shattuck Avenue Northbound					55th Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:45 to 17:45																					
Peak Hour For Entire Intersection Begins at 16:45																					
16:45	4	126	2	0	132	4	27	13	0	44	10	123	11	0	144	17	72	14	0	103	423
17:00	7	134	7	0	148	6	32	5	0	43	3	122	9	0	134	16	90	11	0	117	442
17:15	4	133	4	0	141	5	42	8	0	55	6	144	2	0	152	19	60	7	0	86	434
17:30	3	137	11	0	151	1	33	10	0	44	8	134	11	0	153	18	70	11	0	99	447
Total Volume	18	530	24	0	572	16	134	36	0	186	27	523	33	0	583	70	292	43	0	405	1746
% App Total	3.1%	92.7%	4.2%	0.0%		8.6%	72.0%	19.4%	0.0%		4.6%	89.7%	5.7%	0.0%		17.3%	72.1%	10.6%	0.0%		
PHF	.643	.967	.545	.000	.947	.667	.798	.692	.000	.845	.675	.908	.750	.000	.953	.921	.811	.768	.000	.865	.977

ALL TRAFFIC DATA

City of Oakland
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : C:\Users\Sac - 3\Desktop\NDS\ITMs\13-7519 Oakland\raw\13
Date : 9/19/2013

Unshifted Count = All Vehicles

	Telegraph Avenue Southbound					55th Street Westbound					Telegraph Avenue Northbound					55th Street Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
07:00	5	83	15	0	103	8	1	0	0	9	1	70	5	0	76	19	1	11	0	31	219	0
07:15	6	98	26	0	130	3	2	2	0	7	5	112	5	0	122	30	3	9	0	42	301	0
07:30	4	138	32	0	174	4	1	3	0	8	8	122	15	0	145	42	2	12	0	56	383	0
07:45	5	156	34	0	195	10	3	2	0	15	12	148	8	0	168	31	2	17	0	50	428	0
Total	20	475	107	0	602	25	7	7	0	39	26	452	33	0	511	122	8	49	0	179	1331	0
08:00	8	169	48	0	225	8	3	3	0	14	8	180	12	0	200	41	4	17	0	62	501	0
08:15	9	216	62	0	287	7	0	2	0	9	18	178	9	0	205	41	3	15	0	59	560	0
08:30	5	200	65	0	270	7	5	3	0	15	15	159	7	0	181	27	4	21	0	52	518	0
08:45	5	221	61	0	287	10	2	1	0	13	17	198	12	0	227	27	3	24	0	54	581	0
Total	27	806	236	0	1069	32	10	9	0	51	58	715	40	0	813	136	14	77	0	227	2160	0
15:00	13	190	33	0	236	10	2	6	0	18	18	176	13	0	207	48	6	20	0	74	535	0
15:15	7	211	37	0	255	3	10	9	0	22	12	183	8	0	203	33	6	14	0	53	533	0
15:30	10	158	20	0	188	8	8	4	0	20	10	214	8	0	232	42	7	19	0	68	508	0
15:45	6	190	20	0	216	4	2	2	0	8	15	226	9	0	250	33	4	22	0	59	533	0
Total	36	749	110	0	895	25	22	21	0	68	55	799	38	0	892	156	23	75	0	254	2109	0
16:00	6	178	26	0	210	5	6	2	0	13	22	188	8	0	218	46	4	18	0	68	509	0
16:15	11	191	18	0	220	10	5	7	0	22	18	196	14	0	228	45	8	24	0	77	547	0
16:30	5	189	15	0	209	7	5	3	0	15	13	184	14	0	211	48	4	19	0	71	506	0
16:45	2	180	24	0	206	7	3	2	0	12	14	228	13	0	255	58	6	14	0	78	551	0
Total	24	738	83	0	845	29	19	14	0	62	67	796	49	0	912	197	22	75	0	294	2113	0
17:00	5	235	21	0	261	10	5	7	0	22	12	224	17	0	253	63	7	26	0	96	632	0
17:15	4	255	29	0	288	8	3	5	0	16	24	255	14	0	293	41	4	23	0	68	665	0
17:30	9	254	22	0	285	13	3	4	0	20	20	216	13	0	249	66	3	30	0	99	653	0
17:45	8	234	23	0	265	9	0	2	0	11	19	246	10	0	275	55	4	26	0	85	636	0
Total	26	978	95	0	1099	40	11	18	0	69	75	941	54	0	1070	225	18	105	0	348	2586	0
Grand Total	133	3746	631	0	4510	151	69	69	0	289	281	3703	214	0	4198	836	85	381	0	1302	10299	0
Apprch %	2.9%	83.1%	14.0%	0.0%		52.2%	23.9%	23.9%	0.0%		6.7%	88.2%	5.1%	0.0%		64.2%	6.5%	29.3%	0.0%			
Total %	1.3%	36.4%	6.1%	0.0%	43.8%	1.5%	0.7%	0.7%	0.0%	2.8%	2.7%	36.0%	2.1%	0.0%	40.8%	8.1%	0.8%	3.7%	0.0%	12.6%	100.0%	

AM PEAK HOUR	Telegraph Avenue Southbound					55th Street Westbound					Telegraph Avenue Northbound					55th Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 08:00 to 09:00																					
Peak Hour For Entire Intersection Begins at 08:00																					
08:00	8	169	48	0	225	8	3	3	0	14	8	180	12	0	200	41	4	17	0	62	501
08:15	9	216	62	0	287	7	0	2	0	9	18	178	9	0	205	41	3	15	0	59	560
08:30	5	200	65	0	270	7	5	3	0	15	15	159	7	0	181	27	4	21	0	52	518
08:45	5	221	61	0	287	10	2	1	0	13	17	198	12	0	227	27	3	24	0	54	581
Total Volume	27	806	236	0	1069	32	10	9	0	51	58	715	40	0	813	136	14	77	0	227	2160
% App Total	2.5%	75.4%	22.1%	0.0%		62.7%	19.6%	17.6%	0.0%		7.1%	87.9%	4.9%	0.0%		59.9%	6.2%	33.9%	0.0%		
PHF	.750	.912	.908	.000	.931	.800	.500	.750	.000	.850	.806	.903	.833	.000	.895	.829	.875	.802	.000	.915	.929

PM PEAK HOUR	Telegraph Avenue Southbound					55th Street Westbound					Telegraph Avenue Northbound					55th Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	5	235	21	0	261	10	5	7	0	22	12	224	17	0	253	63	7	26	0	96	632
17:15	4	255	29	0	288	8	3	5	0	16	24	255	14	0	293	41	4	23	0	68	665
17:30	9	254	22	0	285	13	3	4	0	20	20	216	13	0	249	66	3	30	0	99	653
17:45	8	234	23	0	265	9	0	2	0	11	19	246	10	0	275	55	4	26	0	85	636
Total Volume	26	978	95	0	1099	40	11	18	0	69	75	941	54	0	1070	225	18	105	0	348	2586
% App Total	2.4%	89.0%	8.6%	0.0%		58.0%	15.9%	26.1%	0.0%		7.0%	87.9%	5.0%	0.0%		64.7%	5.2%	30.2%	0.0%		
PHF	.722	.959	.819	.000	.954	.769	.550	.643	.000	.784	.781	.923	.794	.000	.913	.852	.643	.875	.000	.879	.972

ALL TRAFFIC DATA

City of Oakland
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7519-005 Martin Luther King Jr Way-54th Street.ppd
Date : 9/19/2013

Unshifted Count = All Vehicles

	Martin Luther King Jr Way Southbound					54th Street Westbound					Martin Luther King Jr Way Northbound					54th Street Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
07:00	0	172	1	2	175	2	0	3	0	5	5	150	2	2	159	0	0	6	0	6	345	4
07:15	1	256	0	1	258	1	0	1	0	2	5	248	5	0	258	0	0	5	0	5	523	1
07:30	0	301	1	0	302	0	0	3	0	3	2	275	2	1	280	0	0	8	0	8	593	1
07:45	0	346	0	1	347	0	1	3	0	4	1	385	4	1	391	2	0	6	0	8	750	2
Total	1	1075	2	4	1082	3	1	10	0	14	13	1058	13	4	1088	2	0	25	0	27	2211	8
08:00	0	344	1	1	346	1	0	0	0	1	5	387	1	1	394	0	2	12	0	14	755	2
08:15	2	392	2	1	397	1	2	4	0	7	1	352	2	2	357	2	0	9	0	11	772	3
08:30	1	411	2	0	414	2	0	1	0	3	4	373	3	3	383	0	0	13	0	13	813	3
08:45	2	338	2	1	343	1	1	3	0	5	5	393	4	4	406	2	1	9	0	12	766	5
Total	5	1485	7	3	1500	5	3	8	0	16	15	1505	10	10	1540	4	3	43	0	50	3106	13
15:00	1	311	2	1	315	2	1	2	0	5	3	321	5	1	330	1	2	6	0	9	659	2
15:15	6	347	0	3	356	2	2	4	0	8	4	334	0	2	340	0	1	6	0	7	711	5
15:30	4	355	2	1	362	3	1	4	0	8	7	362	3	2	374	1	0	5	0	6	750	3
15:45	4	376	1	0	381	1	1	3	0	5	3	379	3	3	388	2	3	7	0	12	786	3
Total	15	1389	5	5	1414	8	5	13	0	26	17	1396	11	8	1432	4	6	24	0	34	2906	13
16:00	1	329	0	3	333	3	0	0	0	3	5	356	5	6	372	0	2	8	0	10	718	9
16:15	4	376	1	1	382	2	0	2	0	4	7	387	3	3	400	1	2	9	0	12	798	4
16:30	0	377	2	2	381	0	3	4	0	7	6	415	2	4	427	1	0	6	0	7	822	6
16:45	1	386	1	2	390	1	1	0	0	2	7	484	3	2	496	1	4	4	0	9	897	4
Total	6	1468	4	8	1486	6	4	6	0	16	25	1642	13	15	1695	3	8	27	0	38	3235	23
17:00	3	357	1	1	362	2	0	5	0	7	4	446	4	4	458	1	0	9	0	10	837	5
17:15	5	372	4	3	384	6	0	2	0	8	9	459	6	2	476	0	0	13	0	13	881	5
17:30	0	371	1	0	372	5	1	1	0	7	12	455	2	0	469	2	1	12	0	15	863	0
17:45	2	345	2	1	350	4	1	0	0	5	6	465	1	3	475	0	0	7	0	7	837	4
Total	10	1445	8	5	1468	17	2	8	0	27	31	1825	13	9	1878	3	1	41	0	45	3418	14
Grand Total	37	6862	26	25	6950	39	15	45	0	99	101	7426	60	46	7633	16	18	160	0	194	14876	71
Apprch %	0.5%	98.7%	0.4%	0.4%		39.4%	15.2%	45.5%	0.0%		1.3%	97.3%	0.8%	0.6%		8.2%	9.3%	82.5%	0.0%			
Total %	0.2%	46.1%	0.2%	0.2%	46.7%	0.3%	0.1%	0.3%	0.0%	0.7%	0.7%	49.9%	0.4%	0.3%	51.3%	0.1%	0.1%	1.1%	0.0%	1.3%	100.0%	

AM PEAK HOUR	Martin Luther King Jr Way Southbound					54th Street Westbound					Martin Luther King Jr Way Northbound					54th Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 08:00 to 09:00																					
Peak Hour For Entire Intersection Begins at 08:00																					
08:00	0	344	1	1	346	1	0	0	0	1	5	387	1	1	394	0	2	12	0	14	755
08:15	2	392	2	1	397	1	2	4	0	7	1	352	2	2	357	2	0	9	0	11	772
08:30	1	411	2	0	414	2	0	1	0	3	4	373	3	3	383	0	0	13	0	13	813
08:45	2	338	2	1	343	1	1	3	0	5	5	393	4	4	406	2	1	9	0	12	766
Total Volume	5	1485	7	3	1500	5	3	8	0	16	15	1505	10	10	1540	4	3	43	0	50	3106
% App Total	0.3%	99.0%	0.5%	0.2%		31.3%	18.8%	50.0%	0.0%		1.0%	97.7%	0.6%	0.6%		8.0%	6.0%	86.0%	0.0%		
PHF	.625	.903	.875	.750	.906	.625	.375	.500	.000	.571	.750	.957	.625	.625	.948	.500	.375	.827	.000	.893	.955

PM PEAK HOUR	Martin Luther King Jr Way Southbound					54th Street Westbound					Martin Luther King Jr Way Northbound					54th Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:45 to 17:45																					
Peak Hour For Entire Intersection Begins at 16:45																					
16:45	1	386	1	2	390	1	1	0	0	2	7	484	3	2	496	1	4	4	0	9	897
17:00	3	357	1	1	362	2	0	5	0	7	4	446	4	4	458	1	0	9	0	10	837
17:15	5	372	4	3	384	6	0	2	0	8	9	459	6	2	476	0	0	13	0	13	881
17:30	0	371	1	0	372	5	1	1	0	7	12	455	2	0	469	2	1	12	0	15	863
Total Volume	9	1486	7	6	1508	14	2	8	0	24	32	1844	15	8	1899	4	5	38	0	47	3478
% App Total	0.6%	98.5%	0.5%	0.4%		58.3%	8.3%	33.3%	0.0%		1.7%	97.1%	0.8%	0.4%		8.5%	10.6%	80.9%	0.0%		
PHF	.450	.962	.438	.500	.967	.583	.500	.400	.000	.750	.667	.952	.625	.500	.957	.500	.313	.731	.000	.783	.969

ALL TRAFFIC DATA

City of Oakland
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7519-006 Dover Street-54th Street.ppd
Date : 9/19/2013

Unshifted Count = All Vehicles

	Dover Street Southbound					54th Street Westbound					Dover Street Northbound					54th Street Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
07:00	0	1	0	0	1	0	2	1	0	3	0	0	0	0	0	0	2	1	0	3	7	0
07:15	1	7	0	0	8	0	0	0	0	0	1	3	0	0	4	1	2	3	0	6	18	0
07:30	0	3	2	0	5	0	0	2	0	2	2	6	2	0	10	0	0	1	0	1	18	0
07:45	0	5	2	0	7	0	0	0	0	0	1	4	1	0	6	2	2	0	0	4	17	0
Total	1	16	4	0	21	0	2	3	0	5	4	13	3	0	20	3	6	5	0	14	60	0
08:00	0	9	0	0	9	1	1	2	0	4	2	4	1	0	7	2	1	3	0	6	26	0
08:15	2	11	4	0	17	2	2	3	0	7	0	5	7	0	12	1	1	1	0	3	39	0
08:30	2	6	0	0	8	0	0	1	0	1	2	3	2	0	7	1	2	0	0	3	19	0
08:45	0	7	1	0	8	1	3	3	0	7	4	5	1	0	10	1	1	2	0	4	29	0
Total	4	33	5	0	42	4	6	9	0	19	8	17	11	0	36	5	5	6	0	16	113	0
15:00	1	5	0	0	6	1	2	0	0	3	1	10	2	0	13	0	2	2	0	4	26	0
15:15	0	6	3	0	9	1	2	2	0	5	1	9	1	0	11	2	4	1	0	7	32	0
15:30	2	4	1	0	7	2	4	2	0	8	3	3	2	0	8	2	1	2	0	5	28	0
15:45	1	4	2	0	7	0	3	3	0	6	0	5	1	0	6	2	5	0	0	7	26	0
Total	4	19	6	0	29	4	11	7	0	22	5	27	6	0	38	6	12	5	0	23	112	0
16:00	0	3	3	0	6	0	1	1	0	2	0	4	1	0	5	1	2	2	0	5	18	0
16:15	2	4	1	0	7	2	1	1	0	4	0	7	0	0	7	3	2	3	0	8	26	0
16:30	0	4	5	0	9	1	0	1	0	2	2	7	1	0	10	3	1	0	0	4	25	0
16:45	2	2	0	0	4	0	0	4	0	4	0	8	1	0	9	4	2	2	0	8	25	0
Total	4	13	9	0	26	3	2	7	0	12	2	26	3	0	31	11	7	7	0	25	94	0
17:00	2	5	2	0	9	1	2	6	0	9	3	9	2	0	14	3	3	1	0	7	39	0
17:15	3	4	0	0	7	1	2	1	0	4	3	7	0	0	10	0	3	0	0	3	24	0
17:30	0	6	0	0	6	0	1	0	0	1	2	7	1	0	10	1	2	1	0	4	21	0
17:45	1	3	3	0	7	0	1	0	0	1	1	5	1	0	7	1	1	1	0	3	18	0
Total	6	18	5	0	29	2	6	7	0	15	9	28	4	0	41	5	9	3	0	17	102	0
Grand Total	19	99	29	0	147	13	27	33	0	73	28	111	27	0	166	30	39	26	0	95	481	0
Apprch %	12.9%	67.3%	19.7%	0.0%		17.8%	37.0%	45.2%	0.0%		16.9%	66.9%	16.3%	0.0%		31.6%	41.1%	27.4%	0.0%			
Total %	4.0%	20.6%	6.0%	0.0%	30.6%	2.7%	5.6%	6.9%	0.0%	15.2%	5.8%	23.1%	5.6%	0.0%	34.5%	6.2%	8.1%	5.4%	0.0%	19.8%	100.0%	

AM PEAK HOUR	Dover Street Southbound					54th Street Westbound					Dover Street Northbound					54th Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 08:00 to 09:00																					
Peak Hour For Entire Intersection Begins at 08:00																					
08:00	0	9	0	0	9	1	1	2	0	4	2	4	1	0	7	2	1	3	0	6	26
08:15	2	11	4	0	17	2	2	3	0	7	0	5	7	0	12	1	1	1	0	3	39
08:30	2	6	0	0	8	0	0	1	0	1	2	3	2	0	7	1	2	0	0	3	19
08:45	0	7	1	0	8	1	3	3	0	7	4	5	1	0	10	1	1	2	0	4	29
Total Volume	4	33	5	0	42	4	6	9	0	19	8	17	11	0	36	5	5	6	0	16	113
% App Total	9.5%	78.6%	11.9%	0.0%		21.1%	31.6%	47.4%	0.0%		22.2%	47.2%	30.6%	0.0%		31.3%	31.3%	37.5%	0.0%		
PHF	.500	.750	.313	.000	.618	.500	.500	.750	.000	.679	.500	.850	.393	.000	.750	.625	.625	.500	.000	.667	.724

PM PEAK HOUR	Dover Street Southbound					54th Street Westbound					Dover Street Northbound					54th Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:15 to 17:15																					
Peak Hour For Entire Intersection Begins at 16:15																					
16:15	2	4	1	0	7	2	1	1	0	4	0	7	0	0	7	3	2	3	0	8	26
16:30	0	4	5	0	9	1	0	1	0	2	2	7	1	0	10	3	1	0	0	4	25
16:45	2	2	0	0	4	0	0	4	0	4	0	8	1	0	9	4	2	2	0	8	25
17:00	2	5	2	0	9	1	2	6	0	9	3	9	2	0	14	3	3	1	0	7	39
Total Volume	6	15	8	0	29	4	3	12	0	19	5	31	4	0	40	13	8	6	0	27	115
% App Total	20.7%	51.7%	27.6%	0.0%		21.1%	15.8%	63.2%	0.0%		12.5%	77.5%	10.0%	0.0%		48.1%	29.6%	22.2%	0.0%		
PHF	.750	.750	.400	.000	.806	.500	.375	.500	.000	.528	.417	.861	.500	.000	.714	.813	.667	.500	.000	.844	.737

ALL TRAFFIC DATA

City of Oakland
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7519-007 Shattuck Aveniue-54th Street.ppd
Date : 9/19/2013

Unshifted Count = All Vehicles

	Shattuck Aveniue Southbound					54th Street Westbound					Shattuck Aveniue Northbound					54th Street Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
07:00	0	59	0	0	59	3	0	1	0	4	2	59	0	0	61	1	0	2	0	3	127	0
07:15	0	73	0	0	73	2	0	0	0	2	0	71	0	0	71	2	0	3	0	5	151	0
07:30	0	109	1	0	110	1	0	1	0	2	1	90	0	0	91	0	0	5	0	5	208	0
07:45	0	147	0	0	147	0	0	0	0	0	1	106	0	0	107	1	0	3	0	4	258	0
Total	0	388	1	0	389	6	0	2	0	8	4	326	0	0	330	4	0	13	0	17	744	0
08:00	0	122	1	0	123	3	0	1	0	4	3	116	0	0	119	1	0	2	0	3	249	0
08:15	0	154	1	0	155	1	0	0	0	1	2	104	0	0	106	0	0	8	0	8	270	0
08:30	0	159	1	0	160	0	0	0	0	0	3	134	0	0	137	0	0	3	0	3	300	0
08:45	0	152	2	0	154	2	0	0	0	2	4	133	0	0	137	0	0	1	0	1	294	0
Total	0	587	5	0	592	6	0	1	0	7	12	487	0	0	499	1	0	14	0	15	1113	0
15:00	2	142	2	0	146	0	0	0	0	0	2	110	1	0	113	1	0	4	0	5	264	0
15:15	1	129	0	0	130	2	0	0	0	2	4	118	1	0	123	1	0	5	0	6	261	0
15:30	1	144	2	0	147	2	0	1	0	3	6	155	1	0	162	1	0	1	0	2	314	0
15:45	0	154	1	0	155	0	0	0	0	0	6	125	1	0	132	2	0	5	0	7	294	0
Total	4	569	5	0	578	4	0	1	0	5	18	508	4	0	530	5	0	15	0	20	1133	0
16:00	0	93	0	0	93	4	0	0	0	4	2	93	2	0	97	1	0	3	0	4	198	0
16:15	0	131	2	0	133	0	0	0	0	0	2	108	0	0	110	0	0	2	0	2	245	0
16:30	0	159	1	0	160	0	0	0	0	0	1	117	0	0	118	2	0	0	0	2	280	0
16:45	1	149	0	0	150	2	0	1	0	3	2	151	2	0	155	0	0	2	0	2	310	0
Total	1	532	3	0	536	6	0	1	0	7	7	469	4	0	480	3	0	7	0	10	1033	0
17:00	0	152	1	0	153	1	0	0	0	1	5	126	0	0	131	0	0	4	0	4	289	0
17:15	1	160	1	0	162	0	0	1	0	1	2	163	2	0	167	1	0	6	0	7	337	0
17:30	0	153	1	0	154	0	0	0	0	0	2	161	0	0	163	2	0	2	0	4	321	0
17:45	0	145	0	0	145	0	0	0	0	0	4	137	0	0	141	1	0	1	0	2	288	0
Total	1	610	3	0	614	1	0	1	0	2	13	587	2	0	602	4	0	13	0	17	1235	0
Grand Total	6	2686	17	0	2709	23	0	6	0	29	54	2377	10	0	2441	17	0	62	0	79	5258	0
Apprch %	0.2%	99.2%	0.6%	0.0%		79.3%	0.0%	20.7%	0.0%		2.2%	97.4%	0.4%	0.0%		21.5%	0.0%	78.5%	0.0%			
Total %	0.1%	51.1%	0.3%	0.0%	51.5%	0.4%	0.0%	0.1%	0.0%	0.6%	1.0%	45.2%	0.2%	0.0%	46.4%	0.3%	0.0%	1.2%	0.0%	1.5%	100.0%	

AM PEAK HOUR	Shattuck Aveniue Southbound					54th Street Westbound					Shattuck Aveniue Northbound					54th Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 08:00 to 09:00																					
Peak Hour For Entire Intersection Begins at 08:00																					
08:00	0	122	1	0	123	3	0	1	0	4	3	116	0	0	119	1	0	2	0	3	249
08:15	0	154	1	0	155	1	0	0	0	1	2	104	0	0	106	0	0	8	0	8	270
08:30	0	159	1	0	160	0	0	0	0	0	3	134	0	0	137	0	0	3	0	3	300
08:45	0	152	2	0	154	2	0	0	0	2	4	133	0	0	137	0	0	1	0	1	294
Total Volume	0	587	5	0	592	6	0	1	0	7	12	487	0	0	499	1	0	14	0	15	1113
% App Total	0.0%	99.2%	0.8%	0.0%		85.7%	0.0%	14.3%	0.0%		2.4%	97.6%	0.0%	0.0%		6.7%	0.0%	93.3%	0.0%		
PHF	.000	.923	.625	.000	.925	.500	.000	.250	.000	.438	.750	.909	.000	.000	.911	.250	.000	.438	.000	.469	.928

PM PEAK HOUR	Shattuck Aveniue Southbound					54th Street Westbound					Shattuck Aveniue Northbound					54th Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:45 to 17:45																					
Peak Hour For Entire Intersection Begins at 16:45																					
16:45	1	149	0	0	150	2	0	1	0	3	2	151	2	0	155	0	0	2	0	2	310
17:00	0	152	1	0	153	1	0	0	0	1	5	126	0	0	131	0	0	4	0	4	289
17:15	1	160	1	0	162	0	0	1	0	1	2	163	2	0	167	1	0	6	0	7	337
17:30	0	153	1	0	154	0	0	0	0	0	2	161	0	0	163	2	0	2	0	4	321
Total Volume	2	614	3	0	619	3	0	2	0	5	11	601	4	0	616	3	0	14	0	17	1257
% App Total	0.3%	99.2%	0.5%	0.0%		60.0%	0.0%	40.0%	0.0%		1.8%	97.6%	0.6%	0.0%		17.6%	0.0%	82.4%	0.0%		
PHF	.500	.959	.750	.000	.955	.375	.000	.500	.000	.417	.550	.922	.500	.000	.922	.375	.000	.583	.000	.607	.932

ALL TRAFFIC DATA

City of Oakland
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7519-008 Martin Luther King Jr Way-53rd Street.ppd
Date : 9/19/2013

Unshifted Count = All Vehicles

	Martin Luther King Jr Way Southbound					53rd Street Westbound					Martin Luther King Jr Way Northbound					53rd Street Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
07:00	2	167	0	0	169	1	0	0	0	1	1	159	3	0	163	0	1	3	0	4	337	0
07:15	3	271	0	0	274	0	1	0	0	1	2	255	4	0	261	3	0	8	0	11	547	0
07:30	1	296	1	0	298	2	0	4	0	6	5	288	4	2	299	0	0	9	0	9	612	2
07:45	3	363	0	2	368	0	1	1	0	2	4	382	3	3	392	0	1	11	0	12	774	5
Total	9	1097	1	2	1109	3	2	5	0	10	12	1084	14	5	1115	3	2	31	0	36	2270	7
08:00	2	343	0	0	345	1	0	2	0	3	4	403	4	1	412	0	3	8	0	11	771	1
08:15	2	425	1	0	428	3	2	3	0	8	5	338	5	0	348	2	0	8	0	10	794	0
08:30	1	418	1	0	420	5	0	1	0	6	4	383	8	0	395	1	0	10	0	11	832	0
08:45	6	360	3	2	371	4	2	6	0	12	4	410	6	3	423	1	1	8	0	10	816	5
Total	11	1546	5	2	1564	13	4	12	0	29	17	1534	23	4	1578	4	4	34	0	42	3213	6
15:00	4	313	0	1	318	2	2	1	0	5	4	317	5	1	327	1	0	10	0	11	661	2
15:15	6	333	1	0	340	8	0	2	0	10	2	345	4	4	355	0	0	8	0	8	713	4
15:30	3	378	1	0	382	5	0	3	0	8	2	369	5	5	381	0	1	10	0	11	782	5
15:45	3	369	3	0	375	4	0	3	0	7	8	365	4	2	379	1	2	12	0	15	776	2
Total	16	1393	5	1	1415	19	2	9	0	30	16	1396	18	12	1442	2	3	40	0	45	2932	13
16:00	1	354	0	0	355	2	0	1	0	3	5	380	5	0	390	2	0	6	0	8	756	0
16:15	1	387	1	0	389	3	1	3	0	7	5	380	5	0	390	5	0	12	0	17	803	0
16:30	3	368	0	0	371	10	0	0	0	10	3	434	8	6	451	0	3	15	0	18	850	6
16:45	2	409	0	0	411	2	2	2	0	6	2	474	7	2	485	0	1	17	0	18	920	2
Total	7	1518	1	0	1526	17	3	6	0	26	15	1668	25	8	1716	7	4	50	0	61	3329	8
17:00	2	358	1	0	361	6	0	1	0	7	3	482	2	1	488	0	1	10	0	11	867	1
17:15	2	423	1	0	426	7	2	2	0	11	1	463	3	0	467	1	1	10	0	12	916	0
17:30	6	362	2	0	370	8	2	1	0	11	3	481	7	4	495	1	2	9	0	12	888	4
17:45	0	385	2	0	387	3	0	0	0	3	7	465	4	3	479	0	3	15	0	18	887	3
Total	10	1528	6	0	1544	24	4	4	0	32	14	1891	16	8	1929	2	7	44	0	53	3558	8
Grand Total	53	7082	18	5	7158	76	15	36	0	127	74	7573	96	37	7780	18	20	199	0	237	15302	42
Apprch %	0.7%	98.9%	0.3%	0.1%		59.8%	11.8%	28.3%	0.0%		1.0%	97.3%	1.2%	0.5%		7.6%	8.4%	84.0%	0.0%			
Total %	0.3%	46.3%	0.1%	0.0%	46.8%	0.5%	0.1%	0.2%	0.0%	0.8%	0.5%	49.5%	0.6%	0.2%	50.8%	0.1%	0.1%	1.3%	0.0%	1.5%	100.0%	

AM PEAK HOUR	Martin Luther King Jr Way Southbound					53rd Street Westbound					Martin Luther King Jr Way Northbound					53rd Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 08:00 to 09:00																					
Peak Hour For Entire Intersection Begins at 08:00																					
08:00	2	343	0	0	345	1	0	2	0	3	4	403	4	1	412	0	3	8	0	11	771
08:15	2	425	1	0	428	3	2	3	0	8	5	338	5	0	348	2	0	8	0	10	794
08:30	1	418	1	0	420	5	0	1	0	6	4	383	8	0	395	1	0	10	0	11	832
08:45	6	360	3	2	371	4	2	6	0	12	4	410	6	3	423	1	1	8	0	10	816
Total Volume	11	1546	5	2	1564	13	4	12	0	29	17	1534	23	4	1578	4	4	34	0	42	3213
% App Total	0.7%	98.8%	0.3%	0.1%		44.8%	13.8%	41.4%	0.0%		1.1%	97.2%	1.5%	0.3%		9.5%	9.5%	81.0%	0.0%		
PHF	.458	.909	.417	.250	.914	.650	.500	.500	.000	.604	.850	.935	.719	.333	.933	.500	.333	.850	.000	.955	.965

PM PEAK HOUR	Martin Luther King Jr Way Southbound					53rd Street Westbound					Martin Luther King Jr Way Northbound					53rd Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:45 to 17:45																					
Peak Hour For Entire Intersection Begins at 16:45																					
16:45	2	409	0	0	411	2	2	2	0	6	2	474	7	2	485	0	1	17	0	18	920
17:00	2	358	1	0	361	6	0	1	0	7	3	482	2	1	488	0	1	10	0	11	867
17:15	2	423	1	0	426	7	2	2	0	11	1	463	3	0	467	1	1	10	0	12	916
17:30	6	362	2	0	370	8	2	1	0	11	3	481	7	4	495	1	2	9	0	12	888
Total Volume	12	1552	4	0	1568	23	6	6	0	35	9	1900	19	7	1935	2	5	46	0	53	3591
% App Total	0.8%	99.0%	0.3%	0.0%		65.7%	17.1%	17.1%	0.0%		0.5%	98.2%	1.0%	0.4%		3.8%	9.4%	86.8%	0.0%		
PHF	.500	.917	.500	.000	.920	.719	.750	.750	.000	.795	.750	.985	.679	.438	.977	.500	.625	.676	.000	.736	.976

ALL TRAFFIC DATA

City of Oakland
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7519-009 Dover Street-53rd Street.ppd
Date : 9/19/2013

Unshifted Count = All Vehicles

	Dover Street Southbound					53rd Street Westbound					Dover Street Northbound					53rd Street Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
07:00	0	1	1	0	2	0	1	0	0	1	0	1	0	0	1	0	1	4	0	5	9	0
07:15	1	8	1	0	10	0	0	0	0	0	2	6	1	0	9	1	1	5	0	7	26	0
07:30	1	4	2	0	7	1	1	0	0	2	3	4	0	0	7	4	1	4	0	9	25	0
07:45	0	4	2	0	6	1	0	1	0	2	2	5	3	0	10	1	1	5	0	7	25	0
Total	2	17	6	0	25	2	2	1	0	5	7	16	4	0	27	6	4	18	0	28	85	0
08:00	2	8	3	0	13	0	1	1	0	2	1	4	1	0	6	2	0	4	0	6	27	0
08:15	0	9	6	0	15	1	0	4	0	5	1	5	5	0	11	3	2	2	0	7	38	0
08:30	0	4	3	0	7	1	2	0	0	3	3	4	1	0	8	4	0	3	0	7	25	0
08:45	0	5	6	0	11	1	0	1	0	2	8	8	4	0	20	2	0	8	0	10	43	0
Total	2	26	18	0	46	3	3	6	0	12	13	21	11	0	45	11	2	17	0	30	133	0
15:00	0	8	1	0	9	2	1	2	0	5	3	7	4	0	14	2	0	7	0	9	37	0
15:15	0	7	4	0	11	0	1	2	0	3	4	9	1	0	14	2	0	5	0	7	35	0
15:30	0	5	5	0	10	0	1	1	0	2	3	2	0	0	5	4	1	6	0	11	28	0
15:45	0	2	4	0	6	3	0	0	0	3	2	7	2	0	11	2	0	6	0	8	28	0
Total	0	22	14	0	36	5	3	5	0	13	12	25	7	0	44	10	1	24	0	35	128	0
16:00	1	3	2	0	6	3	3	0	0	6	1	3	1	0	5	1	0	7	0	8	25	0
16:15	1	5	2	0	8	1	1	1	0	3	5	4	1	0	10	2	0	4	0	6	27	0
16:30	1	5	3	0	9	6	4	1	0	11	1	3	1	0	5	4	3	8	0	15	40	0
16:45	0	6	0	0	6	0	1	1	0	2	3	10	1	0	14	1	0	3	0	4	26	0
Total	3	19	7	0	29	10	9	3	0	22	10	20	4	0	34	8	3	22	0	33	118	0
17:00	0	4	3	0	7	1	1	1	0	3	1	8	2	0	11	3	0	6	0	9	30	0
17:15	1	5	3	0	9	2	0	2	0	4	2	6	3	0	11	3	1	4	0	8	32	0
17:30	0	5	2	0	7	0	1	1	0	2	2	6	0	0	8	4	1	9	0	14	31	0
17:45	0	5	0	0	5	2	1	1	0	4	0	7	0	0	7	2	2	7	0	11	27	0
Total	1	19	8	0	28	5	3	5	0	13	5	27	5	0	37	12	4	26	0	42	120	0
Grand Total	8	103	53	0	164	25	20	20	0	65	47	109	31	0	187	47	14	107	0	168	584	0
Apprch %	4.9%	62.8%	32.3%	0.0%		38.5%	30.8%	30.8%	0.0%		25.1%	58.3%	16.6%	0.0%		28.0%	8.3%	63.7%	0.0%			
Total %	1.4%	17.6%	9.1%	0.0%	28.1%	4.3%	3.4%	3.4%	0.0%	11.1%	8.0%	18.7%	5.3%	0.0%	32.0%	8.0%	2.4%	18.3%	0.0%	28.8%	100.0%	

AM PEAK HOUR	Dover Street Southbound					53rd Street Westbound					Dover Street Northbound					53rd Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 08:00 to 09:00																					
Peak Hour For Entire Intersection Begins at 08:00																					
08:00	2	8	3	0	13	0	1	1	0	2	1	4	1	0	6	2	0	4	0	6	27
08:15	0	9	6	0	15	1	0	4	0	5	1	5	5	0	11	3	2	2	0	7	38
08:30	0	4	3	0	7	1	2	0	0	3	3	4	1	0	8	4	0	3	0	7	25
08:45	0	5	6	0	11	1	0	1	0	2	8	8	4	0	20	2	0	8	0	10	43
Total Volume	2	26	18	0	46	3	3	6	0	12	13	21	11	0	45	11	2	17	0	30	133
% App Total	4.3%	56.5%	39.1%	0.0%		25.0%	25.0%	50.0%	0.0%		28.9%	46.7%	24.4%	0.0%		36.7%	6.7%	56.7%	0.0%		
PHF	.250	.722	.750	.000	.767	.750	.375	.375	.000	.600	.406	.656	.550	.000	.563	.688	.250	.531	.000	.750	.773

PM PEAK HOUR	Dover Street Southbound					53rd Street Westbound					Dover Street Northbound					53rd Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 15:00 to 16:00																					
Peak Hour For Entire Intersection Begins at 15:00																					
15:00	0	8	1	0	9	2	1	2	0	5	3	7	4	0	14	2	0	7	0	9	37
15:15	0	7	4	0	11	0	1	2	0	3	4	9	1	0	14	2	0	5	0	7	35
15:30	0	5	5	0	10	0	1	1	0	2	3	2	0	0	5	4	1	6	0	11	28
15:45	0	2	4	0	6	3	0	0	0	3	2	7	2	0	11	2	0	6	0	8	28
Total Volume	0	22	14	0	36	5	3	5	0	13	12	25	7	0	44	10	1	24	0	35	128
% App Total	0.0%	61.1%	38.9%	0.0%		38.5%	23.1%	38.5%	0.0%		27.3%	56.8%	15.9%	0.0%		28.6%	2.9%	68.6%	0.0%		
PHF	.000	.688	.700	.000	.818	.417	.750	.625	.000	.650	.750	.694	.438	.000	.786	.625	.250	.857	.000	.795	.865

ALL TRAFFIC DATA

City of Oakland
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7519-010 Martin Luther King Jr Way-52nd Street.ppd
Date : 9/19/2013

Unshifted Count = All Vehicles

	Martin Luther King Jr Way Southbound					52nd Street Westbound					Martin Luther King Jr Way Northbound					52nd Street Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
07:00	8	170	0	0	178	8	7	11	0	26	6	161	24	9	200	5	5	10	0	20	424	9
07:15	12	254	0	1	267	14	9	10	0	33	14	241	20	11	286	6	8	14	0	28	614	12
07:30	18	280	0	0	298	26	6	14	0	46	10	273	30	13	326	6	10	29	0	45	715	13
07:45	18	355	0	0	373	16	11	25	0	52	12	349	30	9	400	3	16	31	0	50	875	9
Total	56	1059	0	1	1116	64	33	60	0	157	42	1024	104	42	1212	20	39	84	0	143	2628	43
08:00	27	329	0	0	356	19	14	28	0	61	11	379	30	14	434	11	23	28	0	62	913	14
08:15	19	403	0	0	422	11	24	35	0	70	20	297	29	9	355	7	26	28	0	61	908	9
08:30	31	404	0	0	435	20	20	44	0	84	14	342	33	17	406	5	17	22	0	44	969	17
08:45	28	340	0	0	368	13	22	41	0	76	11	372	40	10	433	7	19	22	0	48	925	10
Total	105	1476	0	0	1581	63	80	148	0	291	56	1390	132	50	1628	30	85	100	0	215	3715	50
15:00	28	315	1	1	345	29	14	27	0	70	17	304	26	17	364	6	12	18	0	36	815	18
15:15	35	310	0	0	345	30	25	48	0	103	13	288	22	19	342	9	19	11	0	39	829	19
15:30	25	359	0	1	385	42	19	35	0	96	14	314	17	14	359	16	21	15	0	52	892	15
15:45	35	342	1	0	378	46	22	44	0	112	15	315	21	14	365	11	15	18	0	44	899	14
Total	123	1326	2	2	1453	147	80	154	0	381	59	1221	86	64	1430	42	67	62	0	171	3435	66
16:00	32	335	0	0	367	33	19	41	0	93	12	324	17	9	362	4	13	20	0	37	859	9
16:15	34	353	0	0	387	26	19	42	0	87	11	334	10	11	366	15	29	15	0	59	899	11
16:30	25	379	0	0	404	31	18	34	0	83	17	383	15	8	423	16	21	21	0	58	968	8
16:45	25	388	0	0	413	34	20	58	0	112	20	413	17	17	467	12	23	18	0	53	1045	17
Total	116	1455	0	0	1571	124	76	175	0	375	60	1454	59	45	1618	47	86	74	0	207	3771	45
17:00	23	364	1	0	388	35	24	49	0	108	19	434	20	6	479	10	27	26	0	63	1038	6
17:15	46	390	0	0	436	29	24	37	0	90	21	400	22	11	454	22	38	26	0	86	1066	11
17:30	49	351	0	0	400	27	16	47	0	90	14	416	32	8	470	21	30	25	0	76	1036	8
17:45	40	339	1	0	380	16	30	48	1	95	10	389	35	8	442	19	23	19	0	61	978	9
Total	158	1444	2	0	1604	107	94	181	1	383	64	1639	109	33	1845	72	118	96	0	286	4118	34
Grand Total	558	6760	4	3	7325	505	363	718	1	1587	281	6728	490	234	7733	211	395	416	0	1022	17667	238
Apprch %	7.6%	92.3%	0.1%	0.0%		31.8%	22.9%	45.2%	0.1%		3.6%	87.0%	6.3%	3.0%		20.6%	38.6%	40.7%	0.0%			
Total %	3.2%	38.3%	0.0%	0.0%	41.5%	2.9%	2.1%	4.1%	0.0%	9.0%	1.6%	38.1%	2.8%	1.3%	43.8%	1.2%	2.2%	2.4%	0.0%	5.8%	100.0%	

AM PEAK HOUR	Martin Luther King Jr Way Southbound					52nd Street Westbound					Martin Luther King Jr Way Northbound					52nd Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 08:00 to 09:00																					
Peak Hour For Entire Intersection Begins at 08:00																					
08:00	27	329	0	0	356	19	14	28	0	61	11	379	30	14	434	11	23	28	0	62	913
08:15	19	403	0	0	422	11	24	35	0	70	20	297	29	9	355	7	26	28	0	61	908
08:30	31	404	0	0	435	20	20	44	0	84	14	342	33	17	406	5	17	22	0	44	969
08:45	28	340	0	0	368	13	22	41	0	76	11	372	40	10	433	7	19	22	0	48	925
Total Volume	105	1476	0	0	1581	63	80	148	0	291	56	1390	132	50	1628	30	85	100	0	215	3715
% App Total	6.6%	93.4%	0.0%	0.0%		21.6%	27.5%	50.9%	0.0%		3.4%	85.4%	8.1%	3.1%		14.0%	39.5%	46.5%	0.0%		
PHF	.847	.913	.000	.000	.909	.788	.833	.841	.000	.866	.700	.917	.825	.735	.938	.682	.817	.893	.000	.867	.958

PM PEAK HOUR	Martin Luther King Jr Way Southbound					52nd Street Westbound					Martin Luther King Jr Way Northbound					52nd Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:45 to 17:45																					
Peak Hour For Entire Intersection Begins at 16:45																					
16:45	25	388	0	0	413	34	20	58	0	112	20	413	17	17	467	12	23	18	0	53	1045
17:00	23	364	1	0	388	35	24	49	0	108	19	434	20	6	479	10	27	26	0	63	1038
17:15	46	390	0	0	436	29	24	37	0	90	21	400	22	11	454	22	38	26	0	86	1066
17:30	49	351	0	0	400	27	16	47	0	90	14	416	32	8	470	21	30	25	0	76	1036
Total Volume	143	1493	1	0	1637	125	84	191	0	400	74	1663	91	42	1870	65	118	95	0	278	4185
% App Total	8.7%	91.2%	0.1%	0.0%		31.3%	21.0%	47.8%	0.0%		4.0%	88.9%	4.9%	2.2%		23.4%	42.4%	34.2%	0.0%		
PHF	.730	.957	.250	.000	.939	.893	.875	.823	.000	.893	.881	.958	.711	.618	.976	.739	.776	.913	.000	.808	.981

ALL TRAFFIC DATA

City of Oakland
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7519-011 CHRCO Garage Driveways-52nd Street.ppd
Date : 9/19/2013

Unshifted Count = All Vehicles

	CHRCO Garage Driveways Southbound					52nd Street Westbound					CHRCO Garage Driveways Northbound					52nd Street Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
07:00	1	0	6	0	7	1	17	11	0	29	1	0	2	0	3	19	16	1	0	36	75	0
07:15	3	0	5	0	8	0	25	15	0	40	2	0	2	0	4	16	25	0	0	41	93	0
07:30	10	0	17	0	27	1	26	14	0	41	4	1	3	0	8	20	37	0	0	57	133	0
07:45	4	0	7	0	11	1	43	19	0	63	1	1	1	0	3	24	41	0	0	65	142	0
Total	18	0	35	0	53	3	111	59	0	173	8	2	8	0	18	79	119	1	0	199	443	0
08:00	6	1	6	0	13	0	52	18	0	70	4	1	2	0	7	22	56	2	0	80	170	0
08:15	2	1	4	0	7	1	66	27	0	94	2	2	2	0	6	25	49	1	0	75	182	0
08:30	2	0	1	0	3	3	76	17	0	96	4	1	3	0	8	31	48	1	0	80	187	0
08:45	3	0	2	0	5	2	71	20	0	93	5	3	3	0	11	34	49	4	0	87	196	0
Total	13	2	13	0	28	6	265	82	0	353	15	7	10	0	32	112	202	8	0	322	735	0
15:00	15	0	14	0	29	3	54	10	0	67	4	2	5	0	11	12	53	1	0	66	173	0
15:15	12	0	26	0	38	3	69	4	0	76	6	2	3	0	11	9	62	3	0	74	199	0
15:30	6	0	31	0	37	1	54	5	0	60	12	1	1	0	14	12	50	6	0	68	179	0
15:45	10	0	32	0	42	6	71	7	0	84	8	3	2	0	13	5	64	2	0	71	210	0
Total	43	0	103	0	146	13	248	26	0	287	30	8	11	0	49	38	229	12	0	279	761	0
16:00	15	0	21	0	36	0	71	4	0	75	3	2	3	0	8	2	55	5	0	62	181	0
16:15	14	0	17	0	31	2	63	1	0	66	4	3	2	0	9	2	66	2	0	70	176	0
16:30	15	0	21	0	36	1	63	4	0	68	4	0	0	0	4	5	57	0	0	62	170	0
16:45	17	1	18	0	36	1	88	4	0	93	5	0	1	0	6	4	60	1	0	65	200	0
Total	61	1	77	0	139	4	285	13	0	302	16	5	6	0	27	13	238	8	0	259	727	0
17:00	17	0	22	0	39	3	85	3	0	91	4	2	3	0	9	5	65	0	0	70	209	0
17:15	14	2	18	0	34	3	62	5	0	70	9	1	3	0	13	1	102	2	0	105	222	0
17:30	15	1	15	0	31	4	73	5	0	82	7	0	6	0	13	7	106	2	0	115	241	0
17:45	14	1	9	0	24	1	77	4	0	82	6	1	2	0	9	9	83	3	0	95	210	0
Total	60	4	64	0	128	11	297	17	0	325	26	4	14	0	44	22	356	7	0	385	882	0
Grand Total	195	7	292	0	494	37	1206	197	0	1440	95	26	49	0	170	264	1144	36	0	1444	3548	0
Apprch %	39.5%	1.4%	59.1%	0.0%		2.6%	83.8%	13.7%	0.0%		55.9%	15.3%	28.8%	0.0%		18.3%	79.2%	2.5%	0.0%			
Total %	5.5%	0.2%	8.2%	0.0%	13.9%	1.0%	34.0%	5.6%	0.0%	40.6%	2.7%	0.7%	1.4%	0.0%	4.8%	7.4%	32.2%	1.0%	0.0%	40.7%	100.0%	

AM PEAK HOUR	CHRCO Garage Driveways Southbound					52nd Street Westbound					CHRCO Garage Driveways Northbound					52nd Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 08:00 to 09:00																					
Peak Hour For Entire Intersection Begins at 08:00																					
08:00	6	1	6	0	13	0	52	18	0	70	4	1	2	0	7	22	56	2	0	80	170
08:15	2	1	4	0	7	1	66	27	0	94	2	2	2	0	6	25	49	1	0	75	182
08:30	2	0	1	0	3	3	76	17	0	96	4	1	3	0	8	31	48	1	0	80	187
08:45	3	0	2	0	5	2	71	20	0	93	5	3	3	0	11	34	49	4	0	87	196
Total Volume	13	2	13	0	28	6	265	82	0	353	15	7	10	0	32	112	202	8	0	322	735
% App Total	46.4%	7.1%	46.4%	0.0%		1.7%	75.1%	23.2%	0.0%		46.9%	21.9%	31.3%	0.0%		34.8%	62.7%	2.5%	0.0%		
PHF	.542	.500	.542	.000	.538	.500	.872	.759	.000	.919	.750	.583	.833	.000	.727	.824	.902	.500	.000	.925	.938

PM PEAK HOUR	CHRCO Garage Driveways Southbound					52nd Street Westbound					CHRCO Garage Driveways Northbound					52nd Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	17	0	22	0	39	3	85	3	0	91	4	2	3	0	9	5	65	0	0	70	209
17:15	14	2	18	0	34	3	62	5	0	70	9	1	3	0	13	1	102	2	0	105	222
17:30	15	1	15	0	31	4	73	5	0	82	7	0	6	0	13	7	106	2	0	115	241
17:45	14	1	9	0	24	1	77	4	0	82	6	1	2	0	9	9	83	3	0	95	210
Total Volume	60	4	64	0	128	11	297	17	0	325	26	4	14	0	44	22	356	7	0	385	882
% App Total	46.9%	3.1%	50.0%	0.0%		3.4%	91.4%	5.2%	0.0%		59.1%	9.1%	31.8%	0.0%		5.7%	92.5%	1.8%	0.0%		
PHF	.882	.500	.727	.000	.821	.688	.874	.850	.000	.893	.722	.500	.583	.000	.846	.611	.840	.583	.000	.837	.915

ALL TRAFFIC DATA

City of Oakland
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7519-012 Dover Street-52nd Street.ppd
Date : 9/19/2013

Unshifted Count = All Vehicles

	Dover Street Southbound					52nd Street Westbound					Hospital Driveway Northbound					52nd Street Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
07:00	3	0	2	0	5	0	24	4	0	28	1	0	1	0	2	2	18	2	0	22	57	0
07:15	4	1	4	0	9	5	40	0	0	45	0	0	0	0	0	5	30	0	0	35	89	0
07:30	3	0	8	0	11	3	31	4	0	38	0	1	0	0	1	10	35	2	0	47	97	0
07:45	4	1	6	0	11	3	58	5	0	66	1	0	0	0	1	2	45	1	0	48	126	0
Total	14	2	20	0	36	11	153	13	0	177	2	1	1	0	4	19	128	5	0	152	369	0
08:00	5	0	10	0	15	4	59	7	0	70	1	0	3	0	4	4	58	0	0	62	151	0
08:15	9	1	4	0	14	3	95	6	0	104	0	0	1	0	1	1	53	0	0	54	173	0
08:30	12	2	4	0	18	1	86	5	0	92	1	0	2	0	3	9	40	1	0	50	163	0
08:45	4	0	5	0	9	3	84	9	0	96	1	0	1	0	2	5	51	0	0	56	163	0
Total	30	3	23	0	56	11	324	27	0	362	3	0	7	0	10	19	202	1	0	222	650	0
15:00	6	0	10	0	16	1	58	8	1	68	0	1	1	0	2	7	61	2	0	70	156	1
15:15	6	2	4	0	12	1	74	2	0	77	0	0	1	0	1	9	70	1	0	80	170	0
15:30	3	1	5	0	9	0	52	3	1	56	2	0	2	0	4	5	53	2	0	60	129	1
15:45	6	0	7	0	13	5	79	3	2	89	1	0	2	0	3	4	70	2	0	76	181	2
Total	21	3	26	0	50	7	263	16	4	290	3	1	6	0	10	25	254	7	0	286	636	4
16:00	9	0	7	0	16	1	65	4	0	70	1	0	2	0	3	6	68	0	0	74	163	0
16:15	5	0	4	0	9	1	60	4	0	65	0	0	2	0	2	3	76	0	1	80	156	1
16:30	12	0	3	0	15	2	68	3	0	73	2	0	4	0	6	2	71	1	2	76	170	2
16:45	7	0	2	0	9	2	87	8	0	97	0	0	3	0	3	5	70	3	0	78	187	0
Total	33	0	16	0	49	6	280	19	0	305	3	0	11	0	14	16	285	4	3	308	676	3
17:00	10	1	3	0	14	2	85	3	0	90	2	2	3	0	7	7	80	0	0	87	198	0
17:15	6	0	5	0	11	0	66	11	1	78	1	0	2	0	3	2	115	0	1	118	210	2
17:30	13	0	3	0	16	1	88	4	0	93	2	0	0	0	2	4	117	4	0	125	236	0
17:45	14	0	2	0	16	0	70	4	0	74	1	0	3	0	4	4	96	0	0	100	194	0
Total	43	1	13	0	57	3	309	22	1	335	6	2	8	0	16	17	408	4	1	430	838	2
Grand Total	141	9	98	0	248	38	1329	97	5	1469	17	4	33	0	54	96	1277	21	4	1398	3169	9
Apprch %	56.9%	3.6%	39.5%	0.0%		2.6%	90.5%	6.6%	0.3%		31.5%	7.4%	61.1%	0.0%		6.9%	91.3%	1.5%	0.3%			
Total %	4.4%	0.3%	3.1%	0.0%	7.8%	1.2%	41.9%	3.1%	0.2%	46.4%	0.5%	0.1%	1.0%	0.0%	1.7%	3.0%	40.3%	0.7%	0.1%	44.1%	100.0%	

AM PEAK HOUR	Dover Street Southbound					52nd Street Westbound					Hospital Driveway Northbound					52nd Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 08:00 to 09:00																					
Peak Hour For Entire Intersection Begins at 08:00																					
08:00	5	0	10	0	15	4	59	7	0	70	1	0	3	0	4	4	58	0	0	62	151
08:15	9	1	4	0	14	3	95	6	0	104	0	0	1	0	1	1	53	0	0	54	173
08:30	12	2	4	0	18	1	86	5	0	92	1	0	2	0	3	9	40	1	0	50	163
08:45	4	0	5	0	9	3	84	9	0	96	1	0	1	0	2	5	51	0	0	56	163
Total Volume	30	3	23	0	56	11	324	27	0	362	3	0	7	0	10	19	202	1	0	222	650
% App Total	53.6%	5.4%	41.1%	0.0%		3.0%	89.5%	7.5%	0.0%		30.0%	0.0%	70.0%	0.0%		8.6%	91.0%	0.5%	0.0%		
PHF	.625	.375	.575	.000	.778	.688	.853	.750	.000	.870	.750	.000	.583	.000	.625	.528	.871	.250	.000	.895	.939

PM PEAK HOUR	Dover Street Southbound					52nd Street Westbound					Hospital Driveway Northbound					52nd Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	10	1	3	0	14	2	85	3	0	90	2	2	3	0	7	7	80	0	0	87	198
17:15	6	0	5	0	11	0	66	11	1	78	1	0	2	0	3	2	115	0	1	118	210
17:30	13	0	3	0	16	1	88	4	0	93	2	0	0	0	2	4	117	4	0	125	236
17:45	14	0	2	0	16	0	70	4	0	74	1	0	3	0	4	4	96	0	0	100	194
Total Volume	43	1	13	0	57	3	309	22	1	335	6	2	8	0	16	17	408	4	1	430	838
% App Total	75.4%	1.8%	22.8%	0.0%		0.9%	92.2%	6.6%	0.3%		37.5%	12.5%	50.0%	0.0%		4.0%	94.9%	0.9%	0.2%		
PHF	.768	.250	.650	.000	.891	.375	.878	.500	.250	.901	.750	.250	.667	.000	.571	.607	.872	.250	.250	.860	.888

ALL TRAFFIC DATA

City of Oakland
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7519-013 SR-24 Ramps-52nd Street.ppd
Date : 9/19/2013

Unshifted Count = All Vehicles

	SR-24 Ramps Southbound					52nd Street Westbound					SR-24 Ramps Northbound					52nd Street Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
07:00	0	0	0	0	0	0	33	140	0	173	0	0	121	0	121	0	18	0	0	18	312	0
07:15	0	0	0	0	0	0	43	138	0	181	0	0	174	0	174	0	33	0	0	33	388	0
07:30	0	0	0	0	0	0	47	174	0	221	0	0	202	0	202	0	48	0	0	48	471	0
07:45	0	0	0	0	0	0	58	245	0	303	0	0	209	0	209	0	41	0	0	41	553	0
Total	0	0	0	0	0	0	181	697	0	878	0	0	706	0	706	0	140	0	0	140	1724	0
08:00	0	0	0	0	0	0	77	252	0	329	0	0	231	0	231	0	68	0	0	68	628	0
08:15	0	0	0	0	0	0	103	301	0	404	0	0	239	0	239	0	61	0	0	61	704	0
08:30	0	0	0	0	0	0	101	272	0	373	0	0	210	0	210	0	48	0	0	48	631	0
08:45	0	0	0	0	0	0	85	251	0	336	0	0	218	0	218	0	54	0	0	54	608	0
Total	0	0	0	0	0	0	366	1076	0	1442	0	0	898	0	898	0	231	0	0	231	2571	0
15:00	0	0	0	0	0	0	58	252	0	310	0	0	218	0	218	0	64	0	0	64	592	0
15:15	0	0	0	0	0	0	82	256	0	338	0	0	236	0	236	0	79	0	0	79	653	0
15:30	0	0	0	0	0	0	63	264	0	327	0	0	243	0	243	0	60	0	0	60	630	0
15:45	0	0	0	0	0	0	74	270	0	344	0	0	249	0	249	0	76	0	0	76	669	0
Total	0	0	0	0	0	0	277	1042	0	1319	0	0	946	0	946	0	279	0	0	279	2544	0
16:00	0	0	0	0	0	0	65	226	0	291	0	0	191	0	191	0	80	0	0	80	562	0
16:15	0	0	0	0	0	0	76	243	0	319	0	0	168	0	168	0	82	0	0	82	569	0
16:30	0	0	0	0	0	0	71	219	0	290	0	0	244	0	244	0	89	0	0	89	623	0
16:45	0	0	0	0	0	0	97	259	0	356	0	0	269	0	269	0	80	0	0	80	705	0
Total	0	0	0	0	0	0	309	947	0	1256	0	0	872	0	872	0	331	0	0	331	2459	0
17:00	0	0	0	0	0	0	98	262	0	360	0	0	266	0	266	0	95	0	0	95	721	0
17:15	0	0	0	0	0	0	69	259	0	328	0	0	256	0	256	0	122	0	0	122	706	0
17:30	0	0	0	0	0	0	100	216	0	316	0	0	233	0	233	0	126	0	0	126	675	0
17:45	0	0	0	0	0	0	68	224	0	292	0	0	273	0	273	0	115	0	0	115	680	0
Total	0	0	0	0	0	0	335	961	0	1296	0	0	1028	0	1028	0	458	0	0	458	2782	0
Grand Total	0	0	0	0	0	0	1468	4723	0	6191	0	0	4450	0	4450	0	1439	0	0	1439	12080	0
Apprch %	0.0%	0.0%	0.0%	0.0%		0.0%	23.7%	76.3%	0.0%		0.0%	0.0%	100.0%	0.0%		0.0%	100.0%	0.0%	0.0%			
Total %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.2%	39.1%	0.0%	51.3%	0.0%	0.0%	36.8%	0.0%	36.8%	0.0%	11.9%	0.0%	0.0%	11.9%	100.0%	

AM PEAK HOUR	SR-24 Ramps Southbound					52nd Street Westbound					SR-24 Ramps Northbound					52nd Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 08:00 to 09:00																					
Peak Hour For Entire Intersection Begins at 08:00																					
08:00	0	0	0	0	0	0	77	252	0	329	0	0	231	0	231	0	68	0	0	68	628
08:15	0	0	0	0	0	0	103	301	0	404	0	0	239	0	239	0	61	0	0	61	704
08:30	0	0	0	0	0	0	101	272	0	373	0	0	210	0	210	0	48	0	0	48	631
08:45	0	0	0	0	0	0	85	251	0	336	0	0	218	0	218	0	54	0	0	54	608
Total Volume	0	0	0	0	0	0	366	1076	0	1442	0	0	898	0	898	0	231	0	0	231	2571
% App Total	0.0%	0.0%	0.0%	0.0%		0.0%	25.4%	74.6%	0.0%		0.0%	0.0%	100.0%	0.0%		0.0%	100.0%	0.0%	0.0%		
PHF	.000	.000	.000	.000	.000	.000	.888	.894	.000	.892	.000	.000	.939	.000	.939	.000	.849	.000	.000	.849	.913

PM PEAK HOUR	SR-24 Ramps Southbound					52nd Street Westbound					SR-24 Ramps Northbound					52nd Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:45 to 17:45																					
Peak Hour For Entire Intersection Begins at 16:45																					
16:45	0	0	0	0	0	0	97	259	0	356	0	0	269	0	269	0	80	0	0	80	705
17:00	0	0	0	0	0	0	98	262	0	360	0	0	266	0	266	0	95	0	0	95	721
17:15	0	0	0	0	0	0	69	259	0	328	0	0	256	0	256	0	122	0	0	122	706
17:30	0	0	0	0	0	0	100	216	0	316	0	0	233	0	233	0	126	0	0	126	675
Total Volume	0	0	0	0	0	0	364	996	0	1360	0	0	1024	0	1024	0	423	0	0	423	2807
% App Total	0.0%	0.0%	0.0%	0.0%		0.0%	26.8%	73.2%	0.0%		0.0%	0.0%	100.0%	0.0%		0.0%	100.0%	0.0%	0.0%		
PHF	.000	.000	.000	.000	.000	.000	.910	.950	.000	.944	.000	.000	.952	.000	.952	.000	.839	.000	.000	.839	.973

ALL TRAFFIC DATA

City of Oakland
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7519-014 Shattuck Avenue-52nd Street.ppd
Date : 9/19/2013

Unshifted Count = All Vehicles

	Shattuck Avenue Southbound					52nd Street Westbound					Shattuck Avenue Northbound					52nd Street Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
07:00	2	12	50	0	64	4	95	11	0	110	20	15	2	0	37	33	65	26	5	129	340	5
07:15	11	19	48	0	78	3	104	7	0	114	23	22	3	0	48	44	113	28	3	188	428	3
07:30	15	31	71	0	117	1	123	10	0	134	27	16	7	0	50	66	116	42	7	231	532	7
07:45	17	31	92	0	140	9	155	20	0	184	30	21	7	0	58	65	151	32	6	254	636	6
Total	45	93	261	0	399	17	477	48	0	542	100	74	19	0	193	208	445	128	21	802	1936	21
08:00	13	25	94	0	132	5	195	17	1	218	32	34	5	0	71	64	202	38	10	314	735	11
08:15	29	36	98	0	163	6	235	15	1	257	41	26	9	0	76	71	191	37	12	311	807	13
08:30	32	36	91	0	159	4	239	20	1	264	43	37	11	0	91	67	144	35	10	256	770	11
08:45	22	39	93	0	154	6	197	30	0	233	38	26	5	0	69	83	154	38	8	283	739	8
Total	96	136	376	0	608	21	866	82	3	972	154	123	30	0	307	285	691	148	40	1164	3051	43
15:00	20	34	99	0	153	3	167	5	0	175	48	40	10	0	98	63	162	45	6	276	702	6
15:15	29	31	75	0	135	9	202	25	0	236	45	37	12	0	94	68	194	51	8	321	786	8
15:30	23	40	88	0	151	6	188	23	0	217	41	46	16	0	103	88	180	44	7	319	790	7
15:45	35	42	92	0	169	6	207	17	0	230	51	43	11	0	105	70	196	43	10	319	823	10
Total	107	147	354	0	608	24	764	70	0	858	185	166	49	0	400	289	732	183	31	1235	3101	31
16:00	15	38	73	0	126	10	165	23	2	200	39	40	10	0	89	58	149	40	7	254	669	9
16:15	19	25	93	0	137	7	182	22	1	212	27	36	11	0	74	55	159	37	12	263	686	13
16:30	22	36	84	0	142	8	167	27	1	203	45	37	8	0	90	75	199	42	6	322	757	7
16:45	26	31	90	0	147	8	217	30	3	258	46	48	9	0	103	78	223	54	10	365	873	13
Total	82	130	340	0	552	33	731	102	7	873	157	161	38	0	356	266	730	173	35	1204	2985	42
17:00	33	37	81	0	151	11	220	30	4	265	37	44	13	0	94	76	203	49	13	341	851	17
17:15	35	40	88	0	163	4	195	32	0	231	42	64	7	0	113	76	235	41	8	360	867	8
17:30	46	35	87	0	168	12	197	37	1	247	21	51	11	0	83	72	252	28	9	361	859	10
17:45	31	34	79	0	144	12	158	29	0	199	31	46	13	0	90	78	260	46	13	397	830	13
Total	145	146	335	0	626	39	770	128	5	942	131	205	44	0	380	302	950	164	43	1459	3407	48
Grand Total	475	652	1666	0	2793	134	3608	430	15	4187	727	729	180	0	1636	1350	3548	796	170	5864	14480	185
Apprch %	17.0%	23.3%	59.6%	0.0%		3.2%	86.2%	10.3%	0.4%		44.4%	44.6%	11.0%	0.0%		23.0%	60.5%	13.6%	2.9%			
Total %	3.3%	4.5%	11.5%	0.0%	19.3%	0.9%	24.9%	3.0%	0.1%	28.9%	5.0%	5.0%	1.2%	0.0%	11.3%	9.3%	24.5%	5.5%	1.2%	40.5%	100.0%	

AM PEAK HOUR	Shattuck Avenue Southbound					52nd Street Westbound					Shattuck Avenue Northbound					52nd Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 08:00 to 09:00																					
Peak Hour For Entire Intersection Begins at 08:00																					
08:00	13	25	94	0	132	5	195	17	1	218	32	34	5	0	71	64	202	38	10	314	735
08:15	29	36	98	0	163	6	235	15	1	257	41	26	9	0	76	71	191	37	12	311	807
08:30	32	36	91	0	159	4	239	20	1	264	43	37	11	0	91	67	144	35	10	256	770
08:45	22	39	93	0	154	6	197	30	0	233	38	26	5	0	69	83	154	38	8	283	739
Total Volume	96	136	376	0	608	21	866	82	3	972	154	123	30	0	307	285	691	148	40	1164	3051
% App Total	15.8%	22.4%	61.8%	0.0%		2.2%	89.1%	8.4%	0.3%		50.2%	40.1%	9.8%	0.0%		24.5%	59.4%	12.7%	3.4%		
PHF	.750	.872	.959	.000	.933	.875	.906	.683	.750	.920	.895	.831	.682	.000	.843	.858	.855	.974	.833	.927	.945

PM PEAK HOUR	Shattuck Avenue Southbound					52nd Street Westbound					Shattuck Avenue Northbound					52nd Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:45 to 17:45																					
Peak Hour For Entire Intersection Begins at 16:45																					
16:45	26	31	90	0	147	8	217	30	3	258	46	48	9	0	103	78	223	54	10	365	873
17:00	33	37	81	0	151	11	220	30	4	265	37	44	13	0	94	76	203	49	13	341	851
17:15	35	40	88	0	163	4	195	32	0	231	42	64	7	0	113	76	235	41	8	360	867
17:30	46	35	87	0	168	12	197	37	1	247	21	51	11	0	83	72	252	28	9	361	859
Total Volume	140	143	346	0	629	35	829	129	8	1001	146	207	40	0	393	302	913	172	40	1427	3450
% App Total	22.3%	22.7%	55.0%	0.0%		3.5%	82.8%	12.9%	0.8%		37.2%	52.7%	10.2%	0.0%		21.2%	64.0%	12.1%	2.8%		
PHF	.761	.894	.961	.000	.936	.729	.942	.872	.500	.944	.793	.809	.769	.000	.869	.968	.906	.796	.769	.977	.988

ALL TRAFFIC DATA

City of Oakland
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : C:\Users\Sac - 3\Desktop\NDS\ITMs\13-7519 Oakland\raw\13
Date : 9/19/2013

Unshifted Count = All Vehicles

	Telegraph Avenue Southbound					Claremont Avenue Westbound					Telegraph Avenue Northbound					52nd Street Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
07:00	6	65	32	0	103	7	3	10	0	20	0	70	9	0	79	0	0	0	0	0	202	0
07:15	9	71	34	0	114	18	7	20	0	45	0	100	17	0	117	0	0	0	0	0	276	0
07:30	12	94	50	0	156	15	9	15	0	39	0	122	29	0	151	5	0	0	0	5	351	0
07:45	14	106	50	0	170	14	6	33	0	53	0	143	33	0	176	1	2	0	0	3	402	0
Total	41	336	166	0	543	54	25	78	0	157	0	435	88	0	523	6	2	0	0	8	1231	0
08:00	10	126	59	0	195	17	14	41	0	72	0	162	28	0	190	1	0	3	0	4	461	0
08:15	9	157	77	0	243	26	12	31	0	69	0	174	35	0	209	0	0	0	0	0	521	0
08:30	20	157	57	0	234	19	15	35	0	69	0	153	24	0	177	1	0	3	0	4	484	0
08:45	25	158	76	0	259	32	11	47	0	90	0	176	30	0	206	4	0	0	0	4	559	0
Total	64	598	269	0	931	94	52	154	0	300	0	665	117	0	782	6	0	6	0	12	2025	0
15:00	13	150	56	0	219	19	15	22	0	56	5	174	36	0	215	4	1	9	0	14	504	0
15:15	13	154	70	0	237	19	12	25	0	56	4	189	24	0	217	1	2	3	0	6	516	0
15:30	15	131	49	0	195	18	12	34	0	64	3	196	38	0	237	3	1	3	0	7	503	0
15:45	19	141	53	0	213	20	22	22	0	64	2	202	40	0	244	3	0	4	0	7	528	0
Total	60	576	228	0	864	76	61	103	0	240	14	761	138	0	913	11	4	19	0	34	2051	0
16:00	27	129	57	0	213	19	12	38	0	69	2	177	27	0	206	1	0	3	0	4	492	0
16:15	18	136	60	0	214	21	9	36	0	66	3	205	32	0	240	1	0	3	0	4	524	0
16:30	17	161	61	0	239	16	24	28	0	68	3	194	37	0	234	1	2	5	0	8	549	0
16:45	20	120	64	0	204	32	19	43	0	94	6	228	55	0	289	2	2	3	0	7	594	0
Total	82	546	242	0	870	88	64	145	0	297	14	804	151	0	969	5	4	14	0	23	2159	0
17:00	28	160	81	0	269	27	20	36	0	83	1	211	47	0	259	6	1	6	0	13	624	0
17:15	27	182	81	0	290	23	16	35	0	74	5	232	64	0	301	3	2	0	0	5	670	0
17:30	26	204	54	0	284	17	17	43	0	77	2	214	58	0	274	2	2	4	0	8	643	0
17:45	26	175	77	0	278	21	10	41	0	72	0	215	75	0	290	2	1	11	0	14	654	0
Total	107	721	293	0	1121	88	63	155	0	306	8	872	244	0	1124	13	6	21	0	40	2591	0
Grand Total	354	2777	1198	0	4329	400	265	635	0	1300	36	3537	738	0	4311	41	16	60	0	117	10057	0
Apprch %	8.2%	64.1%	27.7%	0.0%		30.8%	20.4%	48.8%	0.0%		0.8%	82.0%	17.1%	0.0%		35.0%	13.7%	51.3%	0.0%			
Total %	3.5%	27.6%	11.9%	0.0%	43.0%	4.0%	2.6%	6.3%	0.0%	12.9%	0.4%	35.2%	7.3%	0.0%	42.9%	0.4%	0.2%	0.6%	0.0%	1.2%	100.0%	

AM PEAK HOUR	Telegraph Avenue Southbound					Claremont Avenue Westbound					Telegraph Avenue Northbound					52nd Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 08:00 to 09:00																					
Peak Hour For Entire Intersection Begins at 08:00																					
08:00	10	126	59	0	195	17	14	41	0	72	0	162	28	0	190	1	0	3	0	4	461
08:15	9	157	77	0	243	26	12	31	0	69	0	174	35	0	209	0	0	0	0	0	521
08:30	20	157	57	0	234	19	15	35	0	69	0	153	24	0	177	1	0	3	0	4	484
08:45	25	158	76	0	259	32	11	47	0	90	0	176	30	0	206	4	0	0	0	4	559
Total Volume	64	598	269	0	931	94	52	154	0	300	0	665	117	0	782	6	0	6	0	12	2025
% App Total	6.9%	64.2%	28.9%	0.0%		31.3%	17.3%	51.3%	0.0%		0.0%	85.0%	15.0%	0.0%		50.0%	0.0%	50.0%	0.0%		
PHF	.640	.946	.873	.000	.899	.734	.867	.819	.000	.833	.000	.945	.836	.000	.935	.375	.000	.500	.000	.750	.906

PM PEAK HOUR	Telegraph Avenue Southbound					Claremont Avenue Westbound					Telegraph Avenue Northbound					52nd Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	28	160	81	0	269	27	20	36	0	83	1	211	47	0	259	6	1	6	0	13	624
17:15	27	182	81	0	290	23	16	35	0	74	5	232	64	0	301	3	2	0	0	5	670
17:30	26	204	54	0	284	17	17	43	0	77	2	214	58	0	274	2	2	4	0	8	643
17:45	26	175	77	0	278	21	10	41	0	72	0	215	75	0	290	2	1	11	0	14	654
Total Volume	107	721	293	0	1121	88	63	155	0	306	8	872	244	0	1124	13	6	21	0	40	2591
% App Total	9.5%	64.3%	26.1%	0.0%		28.8%	20.6%	50.7%	0.0%		0.7%	77.6%	21.7%	0.0%		32.5%	15.0%	52.5%	0.0%		
PHF	.955	.884	.904	.000	.966	.815	.788	.901	.000	.922	.400	.940	.813	.000	.934	.542	.750	.477	.000	.714	.967

ALL TRAFFIC DATA

City of Oakland
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7519-016 Telegraph Avenue-51st Street.ppd
Date : 9/19/2013

Unshifted Count = All Vehicles

	Telegraph Avenue Southbound					51st Street Westbound					Telegraph Avenue Northbound					51st Street Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
07:00	8	48	3	0	59	4	47	20	0	71	9	46	7	0	62	22	38	8	0	68	260	0
07:15	18	64	1	0	83	11	64	28	0	103	9	44	7	0	60	38	59	11	0	108	354	0
07:30	15	83	2	0	100	9	75	32	0	116	13	69	8	0	90	54	65	8	0	127	433	0
07:45	31	95	4	0	130	9	115	47	0	171	12	63	13	0	88	63	109	11	0	183	572	0
Total	72	290	10	0	372	33	301	127	0	461	43	222	35	0	300	177	271	38	0	486	1619	0
08:00	36	100	7	0	143	20	127	53	0	200	20	84	12	0	116	59	129	23	0	211	670	0
08:15	38	136	11	1	186	22	136	66	2	226	25	86	17	0	128	57	151	15	0	223	763	3
08:30	39	125	12	0	176	35	141	58	0	234	28	80	14	0	122	46	118	16	0	180	712	0
08:45	33	150	8	0	191	22	126	61	0	209	17	70	15	0	102	66	90	14	0	170	672	0
Total	146	511	38	1	696	99	530	238	2	869	90	320	58	0	468	228	488	68	0	784	2817	3
15:00	45	129	15	0	189	27	69	46	1	143	23	101	30	0	154	74	100	23	0	197	683	1
15:15	47	109	9	0	165	19	104	57	0	180	24	94	25	0	143	60	130	30	0	220	708	0
15:30	53	91	11	1	156	24	109	33	0	166	24	116	26	0	166	77	122	27	0	226	714	1
15:45	45	94	12	0	151	24	115	45	0	184	16	121	22	0	159	72	125	28	0	225	719	0
Total	190	423	47	1	661	94	397	181	1	673	87	432	103	0	622	283	477	108	0	868	2824	2
16:00	53	101	9	0	163	17	110	43	0	170	16	127	14	0	157	50	91	20	0	161	651	0
16:15	46	104	11	0	161	16	102	44	0	162	24	126	21	0	171	67	112	18	0	197	691	0
16:30	50	112	12	0	174	13	87	40	0	140	16	107	18	0	141	71	100	20	0	191	646	0
16:45	47	104	10	0	161	15	128	68	1	212	27	129	23	0	179	93	148	23	0	264	816	1
Total	196	421	42	0	659	61	427	195	1	684	83	489	76	0	648	281	451	81	0	813	2804	1
17:00	61	110	17	0	188	11	114	53	0	178	23	141	31	0	195	74	129	22	0	225	786	0
17:15	80	124	6	0	210	14	117	43	0	174	11	164	26	0	201	94	158	15	0	267	852	0
17:30	74	137	11	0	222	16	118	65	0	199	17	140	17	0	174	87	172	24	0	283	878	0
17:45	64	143	10	0	217	16	110	66	0	192	11	133	25	0	169	92	179	24	0	295	873	0
Total	279	514	44	0	837	57	459	227	0	743	62	578	99	0	739	347	638	85	0	1070	3389	0
Grand Total	883	2159	181	2	3225	344	2114	968	4	3430	365	2041	371	0	2777	1316	2325	380	0	4021	13453	6
Apprch %	27.4%	66.9%	5.6%	0.1%		10.0%	61.6%	28.2%	0.1%		13.1%	73.5%	13.4%	0.0%		32.7%	57.8%	9.5%	0.0%			
Total %	6.6%	16.0%	1.3%	0.0%	24.0%	2.6%	15.7%	7.2%	0.0%	25.5%	2.7%	15.2%	2.8%	0.0%	20.6%	9.8%	17.3%	2.8%	0.0%	29.9%	100.0%	

AM PEAK HOUR	Telegraph Avenue Southbound					51st Street Westbound					Telegraph Avenue Northbound					51st Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 08:00 to 09:00																					
Peak Hour For Entire Intersection Begins at 08:00																					
08:00	36	100	7	0	143	20	127	53	0	200	20	84	12	0	116	59	129	23	0	211	670
08:15	38	136	11	1	186	22	136	66	2	226	25	86	17	0	128	57	151	15	0	223	763
08:30	39	125	12	0	176	35	141	58	0	234	28	80	14	0	122	46	118	16	0	180	712
08:45	33	150	8	0	191	22	126	61	0	209	17	70	15	0	102	66	90	14	0	170	672
Total Volume	146	511	38	1	696	99	530	238	2	869	90	320	58	0	468	228	488	68	0	784	2817
% App Total	21.0%	73.4%	5.5%	0.1%		11.4%	61.0%	27.4%	0.2%		19.2%	68.4%	12.4%	0.0%		29.1%	62.2%	8.7%	0.0%		
PHF	.936	.852	.792	.250	.911	.707	.940	.902	.250	.928	.804	.930	.853	.000	.914	.864	.808	.739	.000	.879	.923

PM PEAK HOUR	Telegraph Avenue Southbound					51st Street Westbound					Telegraph Avenue Northbound					51st Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	61	110	17	0	188	11	114	53	0	178	23	141	31	0	195	74	129	22	0	225	786
17:15	80	124	6	0	210	14	117	43	0	174	11	164	26	0	201	94	158	15	0	267	852
17:30	74	137	11	0	222	16	118	65	0	199	17	140	17	0	174	87	172	24	0	283	878
17:45	64	143	10	0	217	16	110	66	0	192	11	133	25	0	169	92	179	24	0	295	873
Total Volume	279	514	44	0	837	57	459	227	0	743	62	578	99	0	739	347	638	85	0	1070	3389
% App Total	33.3%	61.4%	5.3%	0.0%		7.7%	61.8%	30.6%	0.0%		8.4%	78.2%	13.4%	0.0%		32.4%	59.6%	7.9%	0.0%		
PHF	.872	.899	.647	.000	.943	.891	.972	.860	.000	.933	.674	.881	.798	.000	.919	.923	.891	.885	.000	.907	.965

ALL TRAFFIC DATA

City of Oakland
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7519-017 Martin Luther King Jr Way-47th Street.ppd
Date : 9/19/2013

Unshifted Count = All Vehicles

	Martin Luther King Jr Way Southbound					SR-24 Ramps Westbound					Martin Luther King Jr Way Northbound					47th Street Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
07:00	169	16	3	0	188	0	0	176	0	176	0	21	0	0	21	0	0	5	0	5	390	0
07:15	254	26	3	0	283	0	0	279	0	279	1	19	0	0	20	2	0	1	0	3	585	0
07:30	309	29	2	0	340	0	0	318	0	318	1	28	0	0	29	0	0	3	0	3	690	0
07:45	356	40	2	0	398	0	0	375	0	375	1	33	0	0	34	0	0	6	0	6	813	0
Total	1088	111	10	0	1209	0	0	1148	0	1148	3	101	0	0	104	2	0	15	0	17	2478	0
08:00	326	46	4	0	376	0	0	392	0	392	0	36	0	0	36	1	0	8	0	9	813	0
08:15	378	63	4	0	445	0	0	339	0	339	2	37	0	0	39	1	0	7	0	8	831	0
08:30	380	73	1	0	454	0	0	373	0	373	1	40	0	0	41	1	0	4	0	5	873	0
08:45	333	51	0	0	384	0	0	397	0	397	1	35	0	0	36	1	0	3	0	4	821	0
Total	1417	233	9	0	1659	0	0	1501	0	1501	4	148	0	0	152	4	0	22	0	26	3338	0
15:00	326	47	0	0	373	0	0	297	0	297	4	51	0	0	55	1	0	5	0	6	731	0
15:15	334	51	2	0	387	0	0	299	0	299	4	46	0	0	50	0	0	8	0	8	744	0
15:30	372	58	1	0	431	0	0	325	0	325	1	43	0	0	44	1	0	8	0	9	809	0
15:45	377	61	0	0	438	0	0	311	0	311	1	49	0	0	50	1	0	4	0	5	804	0
Total	1409	217	3	0	1629	0	0	1232	0	1232	10	189	0	0	199	3	0	25	0	28	3088	0
16:00	364	39	1	0	404	0	0	321	0	321	4	46	0	0	50	3	0	3	0	6	781	0
16:15	353	51	0	0	404	0	0	326	0	326	6	38	0	0	44	0	0	3	0	3	777	0
16:30	384	68	1	0	453	0	0	379	0	379	3	63	0	0	66	1	0	7	0	8	906	0
16:45	400	63	1	0	464	0	0	394	0	394	2	68	0	0	70	0	0	4	0	4	932	0
Total	1501	221	3	0	1725	0	0	1420	0	1420	15	215	0	0	230	4	0	17	0	21	3396	0
17:00	356	54	2	0	412	0	0	432	0	432	2	59	0	0	61	3	0	13	0	16	921	0
17:15	407	68	1	0	476	0	0	391	0	391	1	75	0	0	76	1	0	6	0	7	950	0
17:30	384	50	0	0	434	0	0	397	0	397	2	66	0	0	68	0	0	13	0	13	912	0
17:45	333	59	1	0	393	0	0	400	0	400	0	56	0	0	56	1	0	4	0	5	854	0
Total	1480	231	4	0	1715	0	0	1620	0	1620	5	256	0	0	261	5	0	36	0	41	3637	0
Grand Total	6895	1013	29	0	7937	0	0	6921	0	6921	37	909	0	0	946	18	0	115	0	133	15937	0
Apprch %	86.9%	12.8%	0.4%	0.0%		0.0%	0.0%	100.0%	0.0%		3.9%	96.1%	0.0%	0.0%		13.5%	0.0%	86.5%	0.0%			
Total %	43.3%	6.4%	0.2%	0.0%	49.8%	0.0%	0.0%	43.4%	0.0%	43.4%	0.2%	5.7%	0.0%	0.0%	5.9%	0.1%	0.0%	0.7%	0.0%	0.8%	100.0%	

AM PEAK HOUR	Martin Luther King Jr Way Southbound					SR-24 Ramps Westbound					Martin Luther King Jr Way Northbound					47th Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 08:00 to 09:00																					
Peak Hour For Entire Intersection Begins at 08:00																					
08:00	326	46	4	0	376	0	0	392	0	392	0	36	0	0	36	1	0	8	0	9	813
08:15	378	63	4	0	445	0	0	339	0	339	2	37	0	0	39	1	0	7	0	8	831
08:30	380	73	1	0	454	0	0	373	0	373	1	40	0	0	41	1	0	4	0	5	873
08:45	333	51	0	0	384	0	0	397	0	397	1	35	0	0	36	1	0	3	0	4	821
Total Volume	1417	233	9	0	1659	0	0	1501	0	1501	4	148	0	0	152	4	0	22	0	26	3338
% App Total	85.4%	14.0%	0.5%	0.0%		0.0%	0.0%	100.0%	0.0%		2.6%	97.4%	0.0%	0.0%		15.4%	0.0%	84.6%	0.0%		
PHF	.932	.798	.563	.000	.914	.000	.000	.945	.000	.945	.500	.925	.000	.000	.927	1.000	.000	.688	.000	.722	.956

PM PEAK HOUR	Martin Luther King Jr Way Southbound					SR-24 Ramps Westbound					Martin Luther King Jr Way Northbound					47th Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:45 to 17:45																					
Peak Hour For Entire Intersection Begins at 16:45																					
16:45	400	63	1	0	464	0	0	394	0	394	2	68	0	0	70	0	0	4	0	4	932
17:00	356	54	2	0	412	0	0	432	0	432	2	59	0	0	61	3	0	13	0	16	921
17:15	407	68	1	0	476	0	0	391	0	391	1	75	0	0	76	1	0	6	0	7	950
17:30	384	50	0	0	434	0	0	397	0	397	2	66	0	0	68	0	0	13	0	13	912
Total Volume	1547	235	4	0	1786	0	0	1614	0	1614	7	268	0	0	275	4	0	36	0	40	3715
% App Total	86.6%	13.2%	0.2%	0.0%		0.0%	0.0%	100.0%	0.0%		2.5%	97.5%	0.0%	0.0%		10.0%	0.0%	90.0%	0.0%		
PHF	.950	.864	.500	.000	.938	.000	.000	.934	.000	.934	.875	.893	.000	.000	.905	.333	.000	.692	.000	.625	.978

ALL TRAFFIC DATA

City of Oakland
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7679-001 Genoa Street-55th Street.ppd
Date : 11/13/2013

Unshifted Count = All Vehicles

	Genoa Street Southbound					55th Street Westbound					Genoa Street Northbound					55th Street Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
07:00	3	0	0	0	3	0	23	1	0	24	0	0	2	0	2	0	47	0	0	47	76	0
07:15	3	0	0	0	3	1	42	2	0	45	0	0	3	0	3	0	60	0	0	60	111	0
07:30	4	1	2	0	7	2	54	1	0	57	1	1	3	0	5	0	75	0	0	75	144	0
07:45	7	3	1	0	11	2	60	2	0	64	2	2	6	0	10	0	86	0	0	86	171	0
Total	17	4	3	0	24	5	179	6	0	190	3	3	14	0	20	0	268	0	0	268	502	0
08:00	9	5	1	0	15	0	65	0	0	65	0	4	7	0	11	0	80	0	0	80	171	0
08:15	9	2	4	0	15	0	91	6	0	97	0	6	5	0	11	0	101	0	0	101	224	0
08:30	4	3	3	0	10	1	79	2	0	82	3	1	1	0	5	2	89	0	0	91	188	0
08:45	10	2	0	0	12	3	77	2	0	82	3	0	1	0	4	0	84	0	0	84	182	0
Total	32	12	8	0	52	4	312	10	0	326	6	11	14	0	31	2	354	0	0	356	765	0
15:00	1	0	0	0	1	3	58	2	0	63	0	0	4	0	4	0	79	1	0	80	148	0
15:15	2	0	1	0	3	0	80	1	0	81	2	5	3	0	10	0	75	1	0	76	170	0
15:30	7	2	2	0	11	1	65	4	0	70	2	3	4	0	9	0	74	0	0	74	164	0
15:45	1	1	2	0	4	3	63	5	0	71	1	1	1	0	3	1	78	0	0	79	157	0
Total	11	3	5	0	19	7	266	12	0	285	5	9	12	0	26	1	306	2	0	309	639	0
16:00	2	1	1	0	4	2	64	4	0	70	1	3	3	0	7	4	73	1	0	78	159	0
16:15	11	6	0	0	17	2	73	3	0	78	1	4	1	0	6	1	89	0	0	90	191	0
16:30	5	2	1	0	8	2	93	5	0	100	3	1	8	0	12	0	96	0	0	96	216	0
16:45	4	1	3	0	8	3	76	4	0	83	4	6	6	0	16	1	67	0	0	68	175	0
Total	22	10	5	0	37	9	306	16	0	331	9	14	18	0	41	6	325	1	0	332	741	0
17:00	3	1	1	0	5	4	80	4	0	88	1	5	3	0	9	4	94	1	0	99	201	0
17:15	11	0	2	0	13	1	101	11	0	113	3	4	7	0	14	1	97	0	0	98	238	0
17:30	9	1	4	0	14	2	81	10	0	93	0	3	13	0	16	6	112	0	0	118	241	0
17:45	4	4	1	0	9	2	88	5	0	95	2	4	6	0	12	1	87	0	0	88	204	0
Total	27	6	8	0	41	9	350	30	0	389	6	16	29	0	51	12	390	1	0	403	884	0
Grand Total	109	35	29	0	173	34	1413	74	0	1521	29	53	87	0	169	21	1643	4	0	1668	3531	0
Apprch %	63.0%	20.2%	16.8%	0.0%		2.2%	92.9%	4.9%	0.0%		17.2%	31.4%	51.5%	0.0%		1.3%	98.5%	0.2%	0.0%			
Total %	3.1%	1.0%	0.8%	0.0%	4.9%	1.0%	40.0%	2.1%	0.0%	43.1%	0.8%	1.5%	2.5%	0.0%	4.8%	0.6%	46.5%	0.1%	0.0%	47.2%	100.0%	

AM PEAK HOUR	Genoa Street Southbound					55th Street Westbound					Genoa Street Northbound					55th Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 08:00 to 09:00																					
Peak Hour For Entire Intersection Begins at 08:00																					
08:00	9	5	1	0	15	0	65	0	0	65	0	4	7	0	11	0	80	0	0	80	171
08:15	9	2	4	0	15	0	91	6	0	97	0	6	5	0	11	0	101	0	0	101	224
08:30	4	3	3	0	10	1	79	2	0	82	3	1	1	0	5	2	89	0	0	91	188
08:45	10	2	0	0	12	3	77	2	0	82	3	0	1	0	4	0	84	0	0	84	182
Total Volume	32	12	8	0	52	4	312	10	0	326	6	11	14	0	31	2	354	0	0	356	765
% App Total	61.5%	23.1%	15.4%	0.0%		1.2%	95.7%	3.1%	0.0%		19.4%	35.5%	45.2%	0.0%		0.6%	99.4%	0.0%	0.0%		
PHF	.800	.600	.500	.000	.867	.333	.857	.417	.000	.840	.500	.458	.500	.000	.705	.250	.876	.000	.000	.881	.854

PM PEAK HOUR	Genoa Street Southbound					55th Street Westbound					Genoa Street Northbound					55th Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	3	1	1	0	5	4	80	4	0	88	1	5	3	0	9	4	94	1	0	99	201
17:15	11	0	2	0	13	1	101	11	0	113	3	4	7	0	14	1	97	0	0	98	238
17:30	9	1	4	0	14	2	81	10	0	93	0	3	13	0	16	6	112	0	0	118	241
17:45	4	4	1	0	9	2	88	5	0	95	2	4	6	0	12	1	87	0	0	88	204
Total Volume	27	6	8	0	41	9	350	30	0	389	6	16	29	0	51	12	390	1	0	403	884
% App Total	65.9%	14.6%	19.5%	0.0%		2.3%	90.0%	7.7%	0.0%		11.8%	31.4%	56.9%	0.0%		3.0%	96.8%	0.2%	0.0%		
PHF	.614	.375	.500	.000	.732	.563	.866	.682	.000	.861	.500	.800	.558	.000	.797	.500	.871	.250	.000	.854	.917

ALL TRAFFIC DATA

City of Oakland
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7679-002 Genoa Street-52nd Street.ppd
Date : 11/13/2013

Unshifted Count = All Vehicles

	Genoa Street Southbound					52nd Street Westbound					Genoa Street Northbound					52nd Street Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
07:00	0	0	0	0	0	1	3	0	0	4	0	0	0	0	0	0	8	0	0	8	12	0
07:15	0	0	1	0	1	1	3	3	0	7	0	0	1	0	1	0	19	1	0	20	29	0
07:30	4	0	1	0	5	0	15	2	0	17	0	0	0	0	0	0	32	0	0	32	54	0
07:45	11	0	0	0	11	0	10	5	0	15	0	1	0	0	1	1	40	0	0	41	68	0
Total	15	0	2	0	17	2	31	10	0	43	0	1	1	0	2	1	99	1	0	101	163	0
08:00	8	0	1	0	9	1	18	5	0	24	0	0	0	0	0	2	38	0	0	40	73	0
08:15	1	0	2	0	3	1	16	7	0	24	0	0	1	0	1	3	40	0	0	43	71	0
08:30	4	0	0	0	4	1	24	6	0	31	1	0	1	0	2	0	43	1	0	44	81	0
08:45	2	0	0	0	2	1	19	2	0	22	0	0	1	0	1	0	23	0	0	23	48	0
Total	15	0	3	0	18	4	77	20	0	101	1	0	3	0	4	5	144	1	0	150	273	0
15:00	6	0	0	0	6	1	27	3	0	31	0	0	0	0	0	1	22	1	0	24	61	0
15:15	2	0	0	0	2	1	18	8	0	27	0	0	2	0	2	0	20	0	0	20	51	0
15:30	8	0	0	0	8	2	16	8	0	26	0	1	1	0	2	1	23	1	0	25	61	0
15:45	3	0	2	0	5	0	25	9	0	34	0	0	1	0	1	0	24	0	0	24	64	0
Total	19	0	2	0	21	4	86	28	0	118	0	1	4	0	5	2	89	2	0	93	237	0
16:00	1	1	1	0	3	0	23	12	0	35	0	1	0	0	1	0	14	0	0	14	53	0
16:15	7	1	1	0	9	0	13	6	0	19	0	0	0	0	0	0	17	0	0	17	45	0
16:30	3	1	0	0	4	0	26	11	0	37	0	0	0	0	0	0	28	0	0	28	69	0
16:45	1	0	1	0	2	1	31	10	0	42	0	0	1	0	1	0	22	1	0	23	68	0
Total	12	3	3	0	18	1	93	39	0	133	0	1	1	0	2	0	81	1	0	82	235	0
17:00	4	0	0	0	4	1	17	8	0	26	1	0	1	0	2	0	29	1	0	30	62	0
17:15	1	0	1	0	2	0	26	10	0	36	0	0	1	0	1	1	27	0	0	28	67	0
17:30	5	0	1	0	6	0	23	8	0	31	1	0	0	0	1	0	32	0	0	32	70	0
17:45	5	0	1	0	6	0	23	8	0	31	0	0	0	0	0	0	26	0	0	26	63	0
Total	15	0	3	0	18	1	89	34	0	124	2	0	2	0	4	1	114	1	0	116	262	0
Grand Total	76	3	13	0	92	12	376	131	0	519	3	3	11	0	17	9	527	6	0	542	1170	0
Apprch %	82.6%	3.3%	14.1%	0.0%		2.3%	72.4%	25.2%	0.0%		17.6%	17.6%	64.7%	0.0%		1.7%	97.2%	1.1%	0.0%			
Total %	6.5%	0.3%	1.1%	0.0%	7.9%	1.0%	32.1%	11.2%	0.0%	44.4%	0.3%	0.3%	0.9%	0.0%	1.5%	0.8%	45.0%	0.5%	0.0%	46.3%	100.0%	

AM PEAK HOUR	Genoa Street Southbound					52nd Street Westbound					Genoa Street Northbound					52nd Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:45 to 08:45																					
Peak Hour For Entire Intersection Begins at 07:45																					
07:45	11	0	0	0	11	0	10	5	0	15	0	1	0	0	1	1	40	0	0	41	68
08:00	8	0	1	0	9	1	18	5	0	24	0	0	0	0	0	2	38	0	0	40	73
08:15	1	0	2	0	3	1	16	7	0	24	0	0	1	0	1	3	40	0	0	43	71
08:30	4	0	0	0	4	1	24	6	0	31	1	0	1	0	2	0	43	1	0	44	81
Total Volume	24	0	3	0	27	3	68	23	0	94	1	1	2	0	4	6	161	1	0	168	293
% App Total	88.9%	0.0%	11.1%	0.0%		3.2%	72.3%	24.5%	0.0%		25.0%	25.0%	50.0%	0.0%		3.6%	95.8%	0.6%	0.0%		
PHF	.545	.000	.375	.000	.614	.750	.708	.821	.000	.758	.250	.250	.500	.000	.500	.500	.936	.250	.000	.955	.904

PM PEAK HOUR	Genoa Street Southbound					52nd Street Westbound					Genoa Street Northbound					52nd Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:45 to 17:45																					
Peak Hour For Entire Intersection Begins at 16:45																					
16:45	1	0	1	0	2	1	31	10	0	42	0	0	1	0	1	0	22	1	0	23	68
17:00	4	0	0	0	4	1	17	8	0	26	1	0	1	0	2	0	29	1	0	30	62
17:15	1	0	1	0	2	0	26	10	0	36	0	0	1	0	1	1	27	0	0	28	67
17:30	5	0	1	0	6	0	23	8	0	31	1	0	0	0	1	0	32	0	0	32	70
Total Volume	11	0	3	0	14	2	97	36	0	135	2	0	3	0	5	1	110	2	0	113	267
% App Total	78.6%	0.0%	21.4%	0.0%		1.5%	71.9%	26.7%	0.0%		40.0%	0.0%	60.0%	0.0%		0.9%	97.3%	1.8%	0.0%		
PHF	.550	.000	.750	.000	.583	.500	.782	.900	.000	.804	.500	.000	.750	.000	.625	.250	.859	.500	.000	.883	.954

ALL TRAFFIC DATA

City of Oakland
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7679-003 West Street-52nd Street.ppd
Date : 11/13/2013

Unshifted Count = All Vehicles

	West Street Southbound					52nd Street Westbound					West Street Northbound					52nd Street Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
07:00	0	3	0	0	3	7	6	0	0	13	2	0	7	0	9	0	8	1	0	9	34	0
07:15	1	6	0	0	7	10	7	0	0	17	0	0	11	0	11	0	18	3	0	21	56	0
07:30	3	8	0	0	11	16	13	0	0	29	4	0	15	0	19	0	32	4	0	36	95	0
07:45	1	7	0	0	8	11	11	0	0	22	6	0	11	0	17	0	44	5	0	49	96	0
Total	5	24	0	0	29	44	37	0	0	81	12	0	44	0	56	0	102	13	0	115	281	0
08:00	0	8	1	0	9	12	18	0	0	30	7	0	16	0	23	0	42	4	0	46	108	0
08:15	1	5	0	0	6	17	11	0	0	28	4	0	18	0	22	0	45	2	0	47	103	0
08:30	1	9	3	0	13	14	22	0	0	36	7	0	19	0	26	0	39	2	0	41	116	0
08:45	0	21	1	0	22	14	21	0	0	35	4	0	18	0	22	0	33	2	0	35	114	0
Total	2	43	5	0	50	57	72	0	0	129	22	0	71	0	93	0	159	10	0	169	441	0
15:00	2	14	2	0	18	14	25	0	0	39	8	0	28	0	36	0	20	6	0	26	119	0
15:15	0	15	1	0	16	19	15	0	0	34	8	0	21	0	29	0	23	2	0	25	104	0
15:30	1	18	5	0	24	17	13	0	0	30	13	0	27	0	40	1	21	4	0	26	120	0
15:45	4	15	1	0	20	14	23	0	0	37	9	0	28	0	37	0	32	5	0	37	131	0
Total	7	62	9	0	78	64	76	0	0	140	38	0	104	0	142	1	96	17	0	114	474	0
16:00	1	12	1	0	14	15	18	0	0	33	19	0	22	0	41	0	15	0	0	15	103	0
16:15	3	11	1	0	15	31	12	0	0	43	7	0	29	0	36	0	23	7	0	30	124	0
16:30	0	16	2	0	18	24	23	0	0	47	10	0	32	0	42	0	29	6	0	35	142	0
16:45	1	15	0	0	16	22	32	0	0	54	15	0	28	0	43	0	22	2	0	24	137	0
Total	5	54	4	0	63	92	85	0	0	177	51	0	111	0	162	0	89	15	0	104	506	0
17:00	1	14	2	0	17	18	19	0	0	37	7	0	34	0	41	0	24	2	0	26	121	0
17:15	3	12	1	0	16	13	25	0	0	38	10	0	40	0	50	0	35	2	0	37	141	0
17:30	1	11	1	0	13	30	18	0	0	48	11	0	32	0	43	0	31	2	0	33	137	0
17:45	2	15	2	0	19	16	22	0	0	38	12	0	29	0	41	0	34	1	0	35	133	0
Total	7	52	6	0	65	77	84	0	0	161	40	0	135	0	175	0	124	7	0	131	532	0
Grand Total	26	235	24	0	285	334	354	0	0	688	163	0	465	0	628	1	570	62	0	633	2234	0
Apprch %	9.1%	82.5%	8.4%	0.0%		48.5%	51.5%	0.0%	0.0%		26.0%	0.0%	74.0%	0.0%		0.2%	90.0%	9.8%	0.0%			
Total %	1.2%	10.5%	1.1%	0.0%	12.8%	15.0%	15.8%	0.0%	0.0%	30.8%	7.3%	0.0%	20.8%	0.0%	28.1%	0.0%	25.5%	2.8%	0.0%	28.3%	100.0%	

AM PEAK HOUR	West Street Southbound					52nd Street Westbound					West Street Northbound					52nd Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 08:00 to 09:00																					
Peak Hour For Entire Intersection Begins at 08:00																					
08:00	0	8	1	0	9	12	18	0	0	30	7	0	16	0	23	0	42	4	0	46	108
08:15	1	5	0	0	6	17	11	0	0	28	4	0	18	0	22	0	45	2	0	47	103
08:30	1	9	3	0	13	14	22	0	0	36	7	0	19	0	26	0	39	2	0	41	116
08:45	0	21	1	0	22	14	21	0	0	35	4	0	18	0	22	0	33	2	0	35	114
Total Volume	2	43	5	0	50	57	72	0	0	129	22	0	71	0	93	0	159	10	0	169	441
% App Total	4.0%	86.0%	10.0%	0.0%		44.2%	55.8%	0.0%	0.0%		23.7%	0.0%	76.3%	0.0%		0.0%	94.1%	5.9%	0.0%		
PHF	.500	.512	.417	.000	.568	.838	.818	.000	.000	.896	.786	.000	.934	.000	.894	.000	.883	.625	.000	.899	.950

PM PEAK HOUR	West Street Southbound					52nd Street Westbound					West Street Northbound					52nd Street Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:30 to 17:30																					
Peak Hour For Entire Intersection Begins at 16:30																					
16:30	0	16	2	0	18	24	23	0	0	47	10	0	32	0	42	0	29	6	0	35	142
16:45	1	15	0	0	16	22	32	0	0	54	15	0	28	0	43	0	22	2	0	24	137
17:00	1	14	2	0	17	18	19	0	0	37	7	0	34	0	41	0	24	2	0	26	121
17:15	3	12	1	0	16	13	25	0	0	38	10	0	40	0	50	0	35	2	0	37	141
Total Volume	5	57	5	0	67	77	99	0	0	176	42	0	134	0	176	0	110	12	0	122	541
% App Total	7.5%	85.1%	7.5%	0.0%		43.8%	56.3%	0.0%	0.0%		23.9%	0.0%	76.1%	0.0%		0.0%	90.2%	9.8%	0.0%		
PHF	.417	.891	.625	.000	.931	.802	.773	.000	.000	.815	.700	.000	.838	.000	.880	.000	.786	.500	.000	.824	.952

Appendix B

LOS Calculation Worksheets – Existing Conditions

FEHR PEERS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	13	170	219	54	217	57	13	127	1340	49	52	1239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.93			0.98			1.00	0.99		1.00	1.00
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1707			1759			1770	5047		1770	5064
Flt Permitted		0.98			0.77			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1683			1364			1770	5047		1770	5064
Peak-hour factor, PHF	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. Flow (vph)	13	170	219	54	217	57	13	127	1340	49	52	1239
RTOR Reduction (vph)	0	56	0	0	10	0	0	0	3	0	0	2
Lane Group Flow (vph)	0	346	0	0	318	0	0	140	1386	0	52	1264
Confl. Peds. (#/hr)	7		14	14		7				21		
Confl. Bikes (#/hr)			16			15				6		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		25.9			25.9			15.3	45.1		4.5	34.3
Effective Green, g (s)		25.9			25.9			15.3	45.1		4.5	34.3
Actuated g/C Ratio		0.29			0.29			0.17	0.50		0.05	0.38
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		484			392			300	2529		88	1929
v/s Ratio Prot								0.08	c0.27		0.03	c0.25
v/s Ratio Perm		0.21			c0.23							
v/c Ratio		0.72			0.81			0.47	0.55		0.59	0.66
Uniform Delay, d1		28.7			29.8			33.7	15.4		41.8	23.0
Progression Factor		1.00			1.00			0.52	0.12		1.00	1.00
Incremental Delay, d2		5.0			12.0			1.1	0.8		10.2	1.8
Delay (s)		33.7			41.8			18.5	2.6		52.0	24.7
Level of Service		C			D			B	A		D	C
Approach Delay (s)		33.7			41.8				4.0			25.8
Approach LOS		C			D				A			C

Intersection Summary			
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	85.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	27
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	27
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	12
Confl. Bikes (#/hr)	7
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	249	6	20	296	6	7	8	11	8	6	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	18	249	6	20	296	6	7	8	11	8	6	21
Pedestrians		9			20			15			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked	0.92						0.92	0.92		0.92	0.92	0.92
vC, conflicting volume	308			270			675	651	287	668	651	314
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	208			270			606	580	287	598	580	214
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			98	98	99	98	98	97
cM capacity (veh/h)	1235			1266			345	377	735	348	373	750

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	273	322	26	35
Volume Left	18	20	7	8
Volume Right	6	6	11	21
cSH	1235	1266	460	522
Volume to Capacity	0.01	0.02	0.06	0.07
Queue Length 95th (ft)	1	1	4	5
Control Delay (s)	0.7	0.6	13.3	12.4
Lane LOS	A	A	B	B
Approach Delay (s)	0.7	0.6	13.3	12.4
Approach LOS			B	B

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	36.6%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
Existing AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	187	40	25	250	31	28	430	24	25	544	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.99			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.99			0.99			0.99	
Flt Protected		0.99			1.00			1.00			1.00	
Satd. Flow (prot)		1740			1803			1841			1861	
Flt Permitted		0.90			0.96			0.95			0.97	
Satd. Flow (perm)		1573			1744			1759			1813	
Peak-hour factor, PHF	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. Flow (vph)	50	187	40	25	250	31	28	430	24	25	544	28
RTOR Reduction (vph)	0	8	0	0	5	0	0	2	0	0	2	0
Lane Group Flow (vph)	0	269	0	0	301	0	0	480	0	0	595	0
Confl. Peds. (#/hr)	6		13	13		6	7		17	17		7
Confl. Bikes (#/hr)			22			10			13			24
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		25.0			25.0			47.0			47.0	
Effective Green, g (s)		25.0			25.0			47.0			47.0	
Actuated g/C Ratio		0.31			0.31			0.59			0.59	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		491			545			1033			1065	
v/s Ratio Prot												
v/s Ratio Perm		0.17			c0.17			0.27			c0.33	
v/c Ratio		0.55			0.55			0.46			0.56	
Uniform Delay, d1		22.8			22.9			9.4			10.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		4.4			4.0			1.5			2.1	
Delay (s)		27.2			26.9			10.9			12.2	
Level of Service		C			C			B			B	
Approach Delay (s)		27.2			26.9			10.9			12.2	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	73.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
Existing AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	136	14	77	32	10	9	58	715	40	27	806	236
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		0.99	1.00	
Frt		0.95			0.98		1.00	0.99		1.00	0.97	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1651			1713		1761	3497		1768	3406	
Flt Permitted		0.79			0.80		0.23	1.00		0.34	1.00	
Satd. Flow (perm)		1338			1405		435	3497		640	3406	
Peak-hour factor, PHF	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. Flow (vph)	136	14	77	32	10	9	58	715	40	27	806	236
RTOR Reduction (vph)	0	32	0	0	7	0	0	4	0	0	28	0
Lane Group Flow (vph)	0	195	0	0	44	0	58	751	0	27	1014	0
Confl. Peds. (#/hr)	6		11	11		6	13		17	17		13
Confl. Bikes (#/hr)			15			15			43			27
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		16.2			16.2		44.8	44.8		44.8	44.8	
Effective Green, g (s)		16.2			16.2		44.8	44.8		44.8	44.8	
Actuated g/C Ratio		0.23			0.23		0.64	0.64		0.64	0.64	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		309			325		278	2238		409	2179	
v/s Ratio Prot								0.21			c0.30	
v/s Ratio Perm		c0.15			0.03		0.13			0.04		
v/c Ratio		0.63			0.14		0.21	0.34		0.07	0.47	
Uniform Delay, d1		24.2			21.3		5.2	5.8		4.7	6.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.1			0.2		1.7	0.4		0.3	0.7	
Delay (s)		28.3			21.5		6.9	6.2		5.0	7.2	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		28.3			21.5			6.2			7.1	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	61.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	4	3	43	5	3	8	10	15	1505	10	5	1485
Sign Control		Stop			Stop				Free			Free
Grade		0%			0%				0%			0%
Peak Hour 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
Hourly flow rate (vph)	4	3	43	5	3	8	0	15	1505	10	5	1485
Pedestrians		7			6				8			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		1			1				1			
Right turn flare (veh)												
Median type									None			None
Median storage veh)												
Upstream signal (ft)									299			294
pX, platoon unblocked	0.87	0.87	0.80	0.87	0.87	0.86	0.00	0.80			0.86	
vC, conflicting volume	2047	3056	514	2104	3055	513	0	1499			1521	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	605	1765	0	670	1763	0	0	754			1040	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	0.0	2.2			2.2	
p0 queue free %	99	96	95	98	96	99	0	98			99	
cM capacity (veh/h)	311	71	863	266	71	935	0	679			574	

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	50	16	391	752	386	376	742	378
Volume Left	4	5	15	0	0	5	0	0
Volume Right	43	8	0	0	10	0	0	7
cSH	476	230	679	1700	1700	574	1700	1700
Volume to Capacity	0.11	0.07	0.02	0.44	0.23	0.01	0.44	0.22
Queue Length 95th (ft)	9	6	2	0	0	1	0	0
Control Delay (s)	13.4	21.8	0.7	0.0	0.0	0.3	0.0	0.0
Lane LOS	B	C	A			A		
Approach Delay (s)	13.4	21.8	0.2			0.1		
Approach LOS	B	C						

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	59.7%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
5: MLK Way & 54th Street

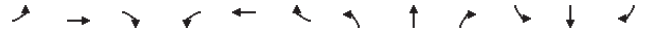
Children's Hospital
Existing AM

Movement	SBR
Lane Configurations	
Volume (veh/h)	7
Sign Control	
Grade	
Peak Hour Factor	1.00
Hourly flow rate (vph)	7
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	
tC, single (s)	
tC, 2 stage (s)	
tF (s)	
p0 queue free %	
cM capacity (veh/h)	

Direction, Lane #

Fehr & Peers

Synchro 8 Report



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	5	6	4	6	9	8	17	11	4	33	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	5	5	6	4	6	9	8	17	11	4	33	5
Pedestrians		10			14			2			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	110	112	48	106	108	42	48			42		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	110	112	48	106	108	42	48			42		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	99	100	99	99	99			100		
cM capacity (veh/h)	831	761	1017	839	764	1017	1559			1562		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	16	19	36	42
Volume Left	5	4	8	4
Volume Right	6	9	11	5
cSH	865	885	1559	1562
Volume to Capacity	0.02	0.02	0.01	0.00
Queue Length 95th (ft)	1	2	0	0
Control Delay (s)	9.2	9.2	1.7	0.7
Lane LOS	A	A	A	A
Approach Delay (s)	9.2	9.2	1.7	0.7
Approach LOS	A	A		

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	19.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	14	12	487	587	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	14	12	487	587	5
Pedestrians	9			2	1	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.81	0.81	0.81			
vC, conflicting volume	1110	600	601			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1018	387	387			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	99			
cM capacity (veh/h)	210	533	939			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	15	499	592
Volume Left	1	12	0
Volume Right	14	0	5
cSH	483	939	1700
Volume to Capacity	0.03	0.01	0.35
Queue Length 95th (ft)	2	1	0
Control Delay (s)	12.7	0.4	0.0
Lane LOS	B	A	
Approach Delay (s)	12.7	0.4	0.0
Approach LOS	B		

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	45.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	4	34	13	4	12	21	1534	23	11	1546	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.98			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.89			0.94		1.00	1.00		1.00	1.00	
Flt Protected		1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1623			1736		1770	5070		1787	5132	
Flt Permitted		0.98			0.89		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1598			1574		1770	5070		1787	5132	
Peak-hour factor, PHF	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. Flow (vph)	4	4	34	13	4	12	21	1534	23	11	1546	5
RTOR Reduction (vph)	0	29	0	0	10	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	13	0	0	19	0	21	1556	0	11	1551	0
Confl. Peds. (#/hr)	7		13	13		7			13			20
Confl. Bikes (#/hr)									5			13
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		14.5			14.5		3.0	61.2		1.8	60.0	
Effective Green, g (s)		14.5			14.5		3.0	61.2		1.8	60.0	
Actuated g/C Ratio		0.16			0.16		0.03	0.68		0.02	0.67	
Clearance Time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		257			253		59	3447		35	3421	
v/s Ratio Prot							0.01	c0.31		0.01	c0.30	
v/s Ratio Perm		0.01			c0.01							
v/c Ratio		0.05			0.07		0.36	0.45		0.31	0.45	
Uniform Delay, d1		31.9			32.1		42.6	6.6		43.5	7.2	
Progression Factor		1.00			1.01		1.17	0.45		0.51	0.22	
Incremental Delay, d2		0.1			0.1		3.1	0.4		4.2	0.4	
Delay (s)		32.0			32.5		53.0	3.3		26.6	2.0	
Level of Service		C			C		D	A		C	A	
Approach Delay (s)		32.0			32.5			4.0			2.1	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	3.7	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.40			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5	
Intersection Capacity Utilization	52.1%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	11	2	17	3	3	6	13	21	11	2	26	18
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	11	2	17	3	3	6	13	21	11	2	26	18
Pedestrians		22			21			2			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			2			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	123	140	59	132	144	50	66			53		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	123	140	59	132	144	50	66			53		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	98	100	100	99	99			100		
cM capacity (veh/h)	803	721	992	784	718	1005	1520			1538		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	30	12	45	46
Volume Left	11	3	13	2
Volume Right	17	6	11	18
cSH	893	859	1520	1538
Volume to Capacity	0.03	0.01	0.01	0.00
Queue Length 95th (ft)	3	1	1	0
Control Delay (s)	9.2	9.3	2.2	0.3
Lane LOS	A	A	A	A
Approach Delay (s)	9.2	9.3	2.2	0.3
Approach LOS	A	A		

Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	21.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	30	85	100	63	80	148	50	56	1390	132	2	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.97			1.00	0.98		1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00			0.99	1.00		1.00	1.00			1.00
Frt	1.00	0.92			1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00			0.98	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1775	1674			1797	1544		1787	5059			1787
Flt Permitted	0.64	1.00			0.77	1.00		0.95	1.00			0.95
Satd. Flow (perm)	1196	1674			1412	1544		1787	5059			1787
Peak-hour factor, PHF	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. Flow (vph)	30	85	100	63	80	148	50	56	1390	132	2	105
RTOR Reduction (vph)	0	54	0	0	0	111	0	0	10	0	0	0
Lane Group Flow (vph)	30	131	0	0	143	37	0	106	1512	0	0	107
Confl. Peds. (#/hr)	10		49	49		10				7		
Confl. Bikes (#/hr)			6			5				1		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	22.2	22.2			22.2	22.2		7.2	44.3			10.0
Effective Green, g (s)	22.2	22.2			22.2	22.2		7.2	44.3			10.0
Actuated g/C Ratio	0.25	0.25			0.25	0.25		0.08	0.49			0.11
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	295	412			348	380		142	2490			198
v/s Ratio Prot		0.08						0.06	c0.30			0.06
v/s Ratio Perm	0.03				c0.10	0.02						
v/c Ratio	0.10	0.32			0.41	0.10		0.75	0.61			0.54
Uniform Delay, d1	26.2	27.7			28.4	26.2		40.5	16.5			37.8
Progression Factor	1.00	1.00			1.00	1.00		0.99	1.05			0.77
Incremental Delay, d2	0.1	0.2			0.3	0.0		8.7	0.5			1.5
Delay (s)	26.3	27.9			28.7	26.2		49.0	18.0			30.5
Level of Service	C	C			C	C		D	B			C
Approach Delay (s)		27.6			27.4				20.0			
Approach LOS		C			C				B			

Intersection Summary			
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: MLK Way & 52nd Street

Children's Hospital
Existing AM

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1476	0
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5136	
Flt Permitted	1.00	
Satd. Flow (perm)	5136	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1476	0
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1476	0
Confl. Peds. (#/hr)		10
Confl. Bikes (#/hr)		10
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	46.6	
Effective Green, g (s)	46.6	
Actuated g/C Ratio	0.52	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2659	
v/s Ratio Prot	c0.29	
v/s Ratio Perm		
v/c Ratio	0.56	
Uniform Delay, d1	14.7	
Progression Factor	0.75	
Incremental Delay, d2	0.8	
Delay (s)	11.7	
Level of Service	B	
Approach Delay (s)	13.0	
Approach LOS	B	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
11: 52nd Street & Garage

Children's Hospital
Existing AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	112	202	8	6	265	82	15	7	10	13	2	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			0.99			0.96			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			0.94	
Frt		1.00			0.97			0.96			0.94	
Flt Protected		0.98			1.00			0.98			0.98	
Satd. Flow (prot)		3441			3432			1465			1629	
Flt Permitted		0.76			0.95			0.93			0.94	
Satd. Flow (perm)		2667			3263			1400			1562	
Peak-hour factor, PHF	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. Flow (vph)	112	202	8	6	265	82	15	7	10	13	2	13
RTOR Reduction (vph)	0	3	0	0	57	0	0	5	0	0	7	0
Lane Group Flow (vph)	0	319	0	0	296	0	0	27	0	0	21	0
Confl. Peds. (#/hr)	17		55	55		17			202	202		
Confl. Bikes (#/hr)			6			5						1
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Prot	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases				6			4			8		
Actuated Green, G (s)		21.0			14.0			23.0			23.0	
Effective Green, g (s)		21.0			14.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.28			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1182			913			644			718	
v/s Ratio Prot		c0.02										
v/s Ratio Perm		0.09			c0.09			c0.02			0.01	
v/c Ratio		0.27			0.32			0.04			0.03	
Uniform Delay, d1		9.5			14.3			7.4			7.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.6			0.9			0.1			0.1	
Delay (s)		10.0			15.2			7.6			7.5	
Level of Service		B			B			A			A	
Approach Delay (s)		10.0			15.2			7.6			7.5	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.16			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	52.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
12: 52nd Street & Dover Street

Children's Hospital
Existing AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	202	1	11	324	27	3	0	7	30	3	23
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	19	202	1	11	324	27	3	0	7	30	3	23
Pedestrians		20			10			12			23	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			1			1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.94			0.96			0.96	0.96	0.96	0.96	0.96	0.94
vC, conflicting volume	374			215			656	648	224	640	636	380
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	297			157			519	510	167	501	497	304
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	98			99			99	100	99	93	99	97
cM capacity (veh/h)	1155			1353			391	413	805	428	433	668

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	222	362	10	56
Volume Left	19	11	3	30
Volume Right	1	27	7	23
cSH	1155	1353	611	503
Volume to Capacity	0.02	0.01	0.02	0.11
Queue Length 95th (ft)	1	1	1	9
Control Delay (s)	0.8	0.3	11.0	13.1
Lane LOS	A	A	B	B
Approach Delay (s)	0.8	0.3	11.0	13.1
Approach LOS			B	B

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	37.9%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
13: SR-24 NB Off-Ramp & 52nd Street

Children's Hospital
Existing AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	231	0	0	366	1076	0	898	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	231	0	0	366	1076	0	898	0	0
Pedestrians							24			
Lane Width (ft)							12.0			
Walking Speed (ft/s)							4.0			
Percent Blockage							2			
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.84						0.84		0.84	0.84
vC, conflicting volume	1442			255			1697	140	1380	621
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1135			255			1440	140	1060	152
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	511			1281			108	862	0	605

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	116	116	244	481	717	449	449
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	359	717	449	449
cSH	1700	1700	1700	1700	1700	862	862
Volume to Capacity	0.07	0.07	0.14	0.28	0.42	0.52	0.52
Queue Length 95th (ft)	0	0	0	0	0	77	77
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	13.6	13.6
Lane LOS						B	B
Approach Delay (s)	0.0		0.0			13.6	
Approach LOS						B	

Intersection Summary				
Average Delay	4.8			
Intersection Capacity Utilization	48.3%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
14: 52nd Street & Shattuck Ave

Children's Hospital
Existing AM

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	40	285	691	148	24	866	82	154	123	30	96	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.99		1.00	1.00		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.97		1.00	0.99		1.00	0.97			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.98
Satd. Flow (prot)		1787	4946		1805	5104		1752	1781			1734
Flt Permitted		0.95	1.00		0.95	1.00		0.44	1.00			0.80
Satd. Flow (perm)		1787	4946		1805	5104		809	1781			1410
Peak-hour factor, PHF	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. Flow (vph)	40	285	691	148	24	866	82	154	123	30	96	136
RTOR Reduction (vph)	0	0	30	0	0	12	0	0	10	0	0	0
Lane Group Flow (vph)	0	325	809	0	24	936	0	154	143	0	0	232
Confl. Peds. (#/hr)				12			5			10	10	
Confl. Bikes (#/hr)				12			1			10		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		21.5	37.7		3.2	19.4		35.1	35.1			24.6
Effective Green, g (s)		21.5	37.7		3.2	19.4		35.1	35.1			24.6
Actuated g/C Ratio		0.24	0.42		0.04	0.22		0.39	0.39			0.27
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		426	2071		64	1100		383	694			385
v/s Ratio Prot		c0.18	0.16		0.01	c0.18		c0.03	0.08			
v/s Ratio Perm								0.13				c0.16
v/c Ratio		0.76	0.39		0.38	0.85		0.40	0.21			0.60
Uniform Delay, d1		31.9	18.2		42.4	33.9		18.8	18.2			28.4
Progression Factor		1.00	1.00		1.23	0.83		1.00	1.00			1.00
Incremental Delay, d2		12.2	0.6		3.0	7.0		0.7	0.7			6.8
Delay (s)		44.1	18.7		55.0	35.1		19.5	18.9			35.3
Level of Service		D	B		E	D		B	B			D
Approach Delay (s)			25.8			35.6			19.2			30.3
Approach LOS			C			D			B			C

Intersection Summary				
HCM 2000 Control Delay	29.2	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		18.0
Intersection Capacity Utilization	100.2%	ICU Level of Service		G
Analysis Period (min)	15			

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	376
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.94
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1419
Flt Permitted	1.00
Satd. Flow (perm)	1419
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	376
RTOR Reduction (vph)	273
Lane Group Flow (vph)	103
Confl. Peds. (#/hr)	16
Confl. Bikes (#/hr)	41
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	24.6
Effective Green, g (s)	24.6
Actuated g/C Ratio	0.27
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	387
v/s Ratio Prot	
v/s Ratio Perm	0.07
v/c Ratio	0.27
Uniform Delay, d1	25.6
Progression Factor	1.00
Incremental Delay, d2	1.7
Delay (s)	27.3
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	0	6	94	52	154	0	665	117	64	598	269
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.98		1.00	0.99			0.99		1.00	0.97	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.93		1.00	0.89			0.98		1.00	0.95	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1576		1698	1569			3853		1770	3282	
Flt Permitted		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (perm)		1576		1698	1569			3853		1770	3282	
Peak-hour factor, PHF	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. Flow (vph)	6	0	6	94	52	154	0	665	117	64	598	269
RTOR Reduction (vph)	0	12	0	0	119	0	0	10	0	0	36	0
Lane Group Flow (vph)	0	0	0	85	96	0	0	772	0	64	831	0
Confl. Peds. (#/hr)	4					4	22		18			22
Confl. Bikes (#/hr)			1			2			33			27
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		1.1		15.4	15.4			48.2		7.3	60.0	
Effective Green, g (s)		1.1		15.4	15.4			48.2		7.3	60.0	
Actuated g/C Ratio		0.01		0.17	0.17			0.54		0.08	0.67	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		19		290	268			2063		143	2188	
v/s Ratio Prot		c0.00		0.05	c0.06			0.20		0.04	c0.25	
v/s Ratio Perm												
v/c Ratio		0.01		0.29	0.36			0.37		0.45	0.38	
Uniform Delay, d1		43.9		32.6	32.9			12.1		39.4	6.7	
Progression Factor		1.00		1.00	1.00			0.97		1.00	1.00	
Incremental Delay, d2		0.1		0.6	0.8			0.5		2.2	0.5	
Delay (s)		44.0		33.1	33.8			12.2		41.7	7.2	
Level of Service		D		C	C			B		D	A	
Approach Delay (s)		44.0			33.6			12.2			9.6	
Approach LOS		D			C			B			A	

Intersection Summary					
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.39				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0		
Intersection Capacity Utilization	70.2%	ICU Level of Service	C		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	228	488	68	101	530	238	90	320	58	147	511	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.98		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3417		1787	3349		1719	3324		1752	3447	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3417		1787	3349		1719	3324		1752	3447	
Peak-hour factor, PHF	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. Flow (vph)	228	488	68	101	530	238	90	320	58	147	511	38
RTOR Reduction (vph)	0	12	0	0	56	0	0	16	0	0	5	0
Lane Group Flow (vph)	228	544	0	101	712	0	90	362	0	147	544	0
Confl. Peds. (#/hr)			31			31			30			37
Confl. Bikes (#/hr)			9			7			27			27
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.2	29.0		8.6	26.9		8.4	24.9		11.0	28.5	
Effective Green, g (s)	11.2	29.0		8.6	26.9		8.4	24.9		11.0	28.5	
Actuated g/C Ratio	0.12	0.32		0.10	0.30		0.09	0.28		0.12	0.32	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	423	1101		170	1000		160	919		214	1091	
v/s Ratio Prot	c0.07	c0.16		0.06	c0.21		0.05	0.11		c0.08	c0.16	
v/s Ratio Perm												
v/c Ratio	0.54	0.49		0.59	0.71		0.56	0.39		0.69	0.50	
Uniform Delay, d1	37.0	24.6		39.0	28.1		39.0	26.4		37.8	24.9	
Progression Factor	1.29	0.79		1.00	1.00		1.00	1.00		1.01	0.86	
Incremental Delay, d2	1.2	1.5		5.5	4.3		4.5	1.3		8.5	1.6	
Delay (s)	49.0	21.0		44.5	32.4		43.5	27.7		46.7	23.1	
Level of Service	D	C		D	C		D	C		D	C	
Approach Delay (s)		29.1			33.8			30.7			28.1	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	30.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	69.9%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	148	0	0	0	0	1501	0	0	0	0	1417	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	148	0	0	0	0	1501	0	0	0	0	1417	233
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	148	0	0	0	0	1501	0	0	0	0	1417	233
Confl. Bikes (#/hr)		2										
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	8.0					45.0					29.0	45.0
Effective Green, g (s)	8.0					45.0					29.0	45.0
Actuated g/C Ratio	0.18					1.00					0.64	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	581					1627					2303	2814
v/s Ratio Prot	0.05										0.40	0.08
v/s Ratio Perm						c0.92						
v/c Ratio	0.25					0.92					0.62	0.08
Uniform Delay, d1	15.9					0.0					4.7	0.0
Progression Factor	1.00					1.00					1.73	1.00
Incremental Delay, d2	1.1					10.2					1.1	0.0
Delay (s)	17.0					10.2					9.2	0.0
Level of Service	B					B					A	A
Approach Delay (s)		17.0			10.2			0.0			7.9	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	1.12			
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	50.1%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	159	10	57	72	0	22	0	71	2	43	5
Peak Hour 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
Hourly flow rate (vph)	0	159	10	57	72	0	22	0	71	2	43	5

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	169	129	22	71	50
Volume Left (vph)	0	57	22	0	2
Volume Right (vph)	10	0	0	71	5
Hadj (s)	-0.02	0.12	0.50	-0.70	-0.02
Departure Headway (s)	4.4	4.6	5.7	4.5	4.8
Degree Utilization, x	0.21	0.16	0.04	0.09	0.07
Capacity (veh/h)	792	751	591	739	693
Control Delay (s)	8.5	8.4	7.8	6.8	8.1
Approach Delay (s)	8.5	8.4	7.0		8.1
Approach LOS	A	A	A		A

Intersection Summary					
Delay			8.1		
Level of Service			A		
Intersection Capacity Utilization			36.2%	ICU Level of Service	A
Analysis Period (min)			15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	5	144	1	4	77	20	1	0	3	15	0	3
Peak Hour 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
Hourly flow rate (vph)	5	144	1	4	77	20	1	0	3	15	0	3

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	150	101	4	18
Volume Left (vph)	5	4	1	15
Volume Right (vph)	1	20	3	3
Hadj (s)	0.02	-0.11	-0.40	0.07
Departure Headway (s)	4.1	4.0	4.1	4.5
Degree Utilization, x	0.17	0.11	0.00	0.02
Capacity (veh/h)	872	890	827	744
Control Delay (s)	7.9	7.5	7.1	7.6
Approach Delay (s)	7.9	7.5	7.1	7.6
Approach LOS	A	A	A	A

Intersection Summary					
Delay			7.7		
Level of Service			A		
Intersection Capacity Utilization			21.4%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis — Children's Hospital
20: Genoa Street & 55th Street — Existing AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	354	0	4	312	10	6	11	14	32	12	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	2	354	0	4	312	10	6	11	14	32	12	8
Pedestrians		8			2			10			11	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	333			364			715	709	366	716	704	336
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	333			364			715	709	366	716	704	336
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	97	98	90	97	99
cM capacity (veh/h)	1221			1196			325	353	677	321	353	695

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	356	326	31	52
Volume Left	2	4	6	32
Volume Right	0	10	14	8
cSH	1221	1196	441	358
Volume to Capacity	0.00	0.00	0.07	0.15
Queue Length 95th (ft)	0	0	6	13
Control Delay (s)	0.1	0.1	13.8	16.7
Lane LOS	A	A	B	C
Approach Delay (s)	0.1	0.1	13.8	16.7
Approach LOS			B	C

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	35.4%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis — Children's Hospital
1: MLK Way & 55th Street — Existing PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	12	247	161	49	137	42	13	197	1578	87	86	1294
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.99			0.99			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.95			0.98			1.00	0.99		1.00	1.00
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1756			1751			1770	5026		1770	5074
Flt Permitted		0.99			0.70			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1739			1233			1770	5026		1770	5074
Peak-hour factor, PHF	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. Flow (vph)	12	247	161	49	137	42	13	197	1578	87	86	1294
RTOR Reduction (vph)	0	24	0	0	9	0	0	0	5	0	0	1
Lane Group Flow (vph)	0	396	0	0	219	0	0	210	1660	0	86	1307
Confl. Peds. (#/hr)	11		15	15		11		12		20	20	
Confl. Bikes (#/hr)			16			12				15		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		28.2			28.2			22.4	48.9		8.4	34.9
Effective Green, g (s)		28.2			28.2			22.4	48.9		8.4	34.9
Actuated g/C Ratio		0.28			0.28			0.22	0.49		0.08	0.35
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		490			347			396	2457		148	1770
v/s Ratio Prot								0.12	c0.33		0.05	c0.26
v/s Ratio Perm		c0.23			0.18							
v/c Ratio		0.81			0.63			0.53	0.68		0.58	0.74
Uniform Delay, d1		33.4			31.3			34.2	19.5		44.1	28.5
Progression Factor		1.00			1.00			0.48	0.32		1.00	1.00
Incremental Delay, d2		9.4			3.7			1.2	1.3		5.7	2.8
Delay (s)		42.8			35.0			17.4	7.5		49.8	31.3
Level of Service		D			D			B	A		D	C
Approach Delay (s)		42.8			35.0				8.6			32.5
Approach LOS		D			D				A			C

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	14
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	14
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	12
Confl. Bikes (#/hr)	15
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	17	390	9	6	174	9	12	12	22	11	9	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	17	390	9	6	174	9	12	12	22	11	9	30
Pedestrians		4			13			7			17	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked				0.99			0.99	0.99	0.99	0.99	0.99	
vC, conflicting volume	200			406			664	648	414	677	648	200
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	200			391			653	636	400	666	636	200
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			97	97	97	97	98	96
cM capacity (veh/h)	1335			1134			344	378	635	327	374	824

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	416	189	46	50
Volume Left	17	6	12	11
Volume Right	9	9	22	30
cSH	1335	1134	454	532
Volume to Capacity	0.01	0.01	0.10	0.09
Queue Length 95th (ft)	1	0	8	8
Control Delay (s)	0.4	0.3	13.8	12.5
Lane LOS	A	A	B	B
Approach Delay (s)	0.4	0.3	13.8	12.5
Approach LOS			B	B

Intersection Summary					
Average Delay	2.1				
Intersection Capacity Utilization	42.5%	ICU Level of Service		A	
Analysis Period (min)	15				

HCM Signalized Intersection Capacity Analysis — Children's Hospital
3: 55th Street & Shattuck Ave — Existing PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	292	43	16	134	36	27	523	33	18	530	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.99			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.97			0.99			0.99	
Flt Protected		0.99			1.00			1.00			1.00	
Satd. Flow (prot)		1756			1772			1839			1863	
Flt Permitted		0.92			0.96			0.96			0.98	
Satd. Flow (perm)		1626			1709			1775			1824	
Peak-hour factor, PHF	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. Flow (vph)	70	292	43	16	134	36	27	523	33	18	530	24
RTOR Reduction (vph)	0	5	0	0	11	0	0	3	0	0	2	0
Lane Group Flow (vph)	0	400	0	0	175	0	0	580	0	0	570	0
Confl. Peds. (#/hr)	11		11	11		11	19		7	7		19
Confl. Bikes (#/hr)			15			10			31			22
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		29.0			29.0			43.0			43.0	
Effective Green, g (s)		29.0			29.0			43.0			43.0	
Actuated g/C Ratio		0.36			0.36			0.54			0.54	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		589			619			954			980	
v/s Ratio Prot												
v/s Ratio Perm		c0.25			0.10			c0.33			0.31	
v/c Ratio		0.68			0.28			0.61			0.58	
Uniform Delay, d1		21.6			18.1			12.7			12.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		6.2			1.1			2.9			2.5	
Delay (s)		27.8			19.3			15.6			15.0	
Level of Service		C			B			B			B	
Approach Delay (s)		27.8			19.3			15.6			15.0	
Approach LOS		C			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	85.9%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Children's Hospital
4: 55th Street & Telegraph Ave — Existing PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	228	20	93	38	14	18	70	923	57	20	924	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			0.99		0.99	1.00		0.99	1.00	
Frt		0.96			0.97		1.00	0.99		1.00	0.99	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1652			1690		1751	3492		1773	3488	
Flt Permitted		0.78			0.78		0.22	1.00		0.24	1.00	
Satd. Flow (perm)		1327			1355		412	3492		443	3488	
Peak-hour factor, PHF	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. Flow (vph)	228	20	93	38	14	18	70	923	57	20	924	96
RTOR Reduction (vph)	0	17	0	0	13	0	0	4	0	0	7	0
Lane Group Flow (vph)	0	324	0	0	57	0	70	976	0	20	1013	0
Confl. Peds. (#/hr)	11		26	26		11	25		17	17		25
Confl. Bikes (#/hr)			8			9			29			45
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		27.4			27.4		53.6	53.6		53.6	53.6	
Effective Green, g (s)		27.4			27.4		53.6	53.6		53.6	53.6	
Actuated g/C Ratio		0.30			0.30		0.60	0.60		0.60	0.60	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		403			412		245	2079		263	2077	
v/s Ratio Prot								0.28			c0.29	
v/s Ratio Perm		c0.24			0.04		0.17			0.05		
v/c Ratio		0.80			0.14		0.29	0.47		0.08	0.49	
Uniform Delay, d1		28.8			22.7		8.9	10.2		7.7	10.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		11.0			0.2		2.9	0.8		0.6	0.8	
Delay (s)		39.8			22.9		11.8	11.0		8.3	11.2	
Level of Service		D			C		B	B		A	B	
Approach Delay (s)		39.8			22.9			11.0			11.1	
Approach LOS		D			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	70.5%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (veh/h)	4	5	38	14	2	8	8	32	1844	15	6	9
Sign Control		Stop			Stop				Free			
Grade		0%			0%				0%			
Peak Hour 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
Hourly flow rate (vph)	4	5	38	14	2	8	0	32	1844	15	0	9
Pedestrians		5			19				11			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		0			2				1			
Right turn flare (veh)												
Median type									None			
Median storage veh)												
Upstream signal (ft)									299			
pX, platoon unblocked	0.87	0.87	0.78	0.87	0.87	0.81	0.00	0.78			0.00	0.81
vC, conflicting volume	2200	3454	515	2499	3450	641	0	1498			0	1878
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	413	1853	0	757	1848	0	0	641			0	1276
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			0.0	4.1
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	0.0	2.2			0.0	2.2
p0 queue free %	99	92	95	93	97	99	0	96			0	98
cM capacity (veh/h)	415	60	837	214	60	873	0	728			0	437

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	47	24	493	922	476	380	743	378
Volume Left	4	14	32	0	0	9	0	0
Volume Right	38	8	0	0	15	0	0	7
cSH	339	223	728	1700	1700	437	1700	1700
Volume to Capacity	0.14	0.11	0.04	0.54	0.28	0.02	0.44	0.22
Queue Length 95th (ft)	12	9	3	0	0	2	0	0
Control Delay (s)	17.3	23.1	1.2	0.0	0.0	0.7	0.0	0.0
Lane LOS	C	C	A			A		
Approach Delay (s)	17.3	23.1	0.3			0.2		
Approach LOS	C	C						

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	77.8%	ICU Level of Service	D	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
5: MLK Way & 54th Street

Children's Hospital
Existing PM

Movement	SBT	SBR
Lane Configurations		
Volume (veh/h)	1486	7
Sign Control	Free	
Grade	0%	
Peak Hour Factor	1.00	1.00
Hourly flow rate (vph)	1486	7
Pedestrians		
Lane Width (ft)		
Walking Speed (ft/s)		
Percent Blockage		
Right turn flare (veh)		
Median type	None	
Median storage veh)		
Upstream signal (ft)	294	
pX, platoon unblocked		
vC, conflicting volume		
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol		
tC, single (s)		
tC, 2 stage (s)		
tF (s)		
p0 queue free %		
cM capacity (veh/h)		

Direction, Lane #

Fehr & Peers

Synchro 8 Report

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	10	4	2	5	11	8	31	4	7	17	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	8	10	4	2	5	11	8	31	4	7	17	2
Pedestrians		12			8			6			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	110	103	36	104	102	44	31			43		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	110	103	36	104	102	44	31			43		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	100	100	99	99	99			100		
cM capacity (veh/h)	832	770	1027	842	771	1022	1579			1568		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	22	18	43	26
Volume Left	8	2	8	7
Volume Right	4	11	4	2
cSH	831	918	1579	1568
Volume to Capacity	0.03	0.02	0.01	0.00
Queue Length 95th (ft)	2	1	0	0
Control Delay (s)	9.5	9.0	1.4	2.0
Lane LOS	A	A	A	A
Approach Delay (s)	9.5	9.0	1.4	2.0
Approach LOS	A	A		

Intersection Summary				
Average Delay	4.4			
Intersection Capacity Utilization	18.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	3	14	11	601	614	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	3	14	11	601	614	3
Pedestrians	25				1	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	2				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.83	0.79	0.79			
vC, conflicting volume	1264	640	642			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1023	416	418			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	97	99			
cM capacity (veh/h)	211	498	886			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	17	612	617
Volume Left	3	11	0
Volume Right	14	0	3
cSH	401	886	1700
Volume to Capacity	0.04	0.01	0.36
Queue Length 95th (ft)	3	1	0
Control Delay (s)	14.4	0.3	0.0
Lane LOS	B	A	
Approach Delay (s)	14.4	0.3	0.0
Approach LOS	B		

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	50.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	2	5	46	23	6	6	7	9	1900	19	12	1552
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.88			0.98			1.00	1.00		1.00	1.00
Flt Protected		1.00			0.97			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1612			1787			1770	5072		1787	5133
Flt Permitted		0.99			0.82			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1603			1509			1770	5072		1787	5133
Peak-hour factor, PHF	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. Flow (vph)	2	5	46	23	6	6	7	9	1900	19	12	1552
RTOR Reduction (vph)	0	39	0	0	5	0	0	0	1	0	0	0
Lane Group Flow (vph)	0	14	0	0	30	0	0	16	1918	0	12	1556
Confl. Peds. (#/hr)	8		4	4		8		14		32	32	
Confl. Bikes (#/hr)			4			2				13		
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		15.9			15.9			3.0	69.8		1.8	68.6
Effective Green, g (s)		15.9			15.9			3.0	69.8		1.8	68.6
Actuated g/C Ratio		0.16			0.16			0.03	0.70		0.02	0.69
Clearance Time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		254			239			53	3540		32	3521
v/s Ratio Prot								0.01	c0.38		0.01	c0.30
v/s Ratio Perm		0.01			c0.02							
v/c Ratio		0.06			0.13			0.30	0.54		0.38	0.44
Uniform Delay, d1		35.7			36.1			47.5	7.3		48.5	7.1
Progression Factor		1.00			1.08			1.47	0.14		0.77	0.47
Incremental Delay, d2		0.1			0.2			2.2	0.4		5.4	0.3
Delay (s)		35.8			39.1			72.2	1.5		42.8	3.6
Level of Service		D			D			E	A		D	A
Approach Delay (s)		35.8			39.1				2.0			3.9
Approach LOS		D			D				A			A

Intersection Summary			
HCM 2000 Control Delay	3.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: MLK Way & 53rd Street

Children's Hospital
Existing PM

Movement	SBR
Lane Configurations	
Volume (vph)	4
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	4
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	14
Confl. Bikes (#/hr)	16
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis — Children's Hospital
9: Dover Street & 53rd Street — Existing PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	11	2	22	3	3	5	8	30	6	1	20	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	11	2	22	3	3	5	8	30	6	1	20	8
Pedestrians		25			10			4			4	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			1			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	110	113	53	112	114	47	53			46		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	110	113	53	112	114	47	53			46		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	98	100	100	100	99			100		
cM capacity (veh/h)	822	754	996	817	753	1016	1533			1562		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	35	11	44	29
Volume Left	11	3	8	1
Volume Right	22	5	6	8
cSH	918	875	1533	1562
Volume to Capacity	0.04	0.01	0.01	0.00
Queue Length 95th (ft)	3	1	0	0
Control Delay (s)	9.1	9.2	1.4	0.3
Lane LOS	A	A	A	A
Approach Delay (s)	9.1	9.2	1.4	0.3
Approach LOS	A	A		

Intersection Summary				
Average Delay			4.1	
Intersection Capacity Utilization			20.2%	ICU Level of Service
Analysis Period (min)			15	

HCM Signalized Intersection Capacity Analysis — Children's Hospital
10: MLK Way & 52nd Street — Existing PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	65	118	95	125	84	191	42	74	1663	91	143	1493
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5		4.0	4.5
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91		1.00	0.91
Frpb, ped/bikes	1.00	0.97			1.00	0.97		1.00	1.00		1.00	1.00
Flpb, ped/bikes	0.99	1.00			0.98	1.00		1.00	1.00		1.00	1.00
Frt	1.00	0.93			1.00	0.85		1.00	0.99		1.00	1.00
Flt Protected	0.95	1.00			0.97	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1768	1695			1765	1535		1787	5086		1787	5135
Flt Permitted	0.51	1.00			0.56	1.00		0.95	1.00		0.95	1.00
Satd. Flow (perm)	943	1695			1016	1535		1787	5086		1787	5135
Peak-hour factor, PHF	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. Flow (vph)	65	118	95	125	84	191	42	74	1663	91	143	1493
RTOR Reduction (vph)	0	31	0	0	0	143	0	0	6	0	0	0
Lane Group Flow (vph)	65	182	0	0	209	48	0	116	1748	0	143	1494
Confl. Peds. (#/hr)	16		61	61		16		13		10	10	
Confl. Bikes (#/hr)			9			4				15		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8		8						
Actuated Green, G (s)	25.2	25.2			25.2	25.2		10.8	43.8		17.5	50.0
Effective Green, g (s)	25.2	25.2			25.2	25.2		10.8	43.8		17.5	50.0
Actuated g/C Ratio	0.25	0.25			0.25	0.25		0.11	0.44		0.18	0.50
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5		4.0	4.5
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	237	427			256	386		192	2227		312	2567
v/s Ratio Prot		0.11						0.06	c0.34		0.08	c0.29
v/s Ratio Perm	0.07				c0.21	0.03						
v/c Ratio	0.27	0.43			0.82	0.12		0.60	0.79		0.46	0.58
Uniform Delay, d1	30.1	31.3			35.2	28.9		42.6	24.1		37.0	17.6
Progression Factor	1.00	1.00			0.95	1.95		0.98	1.06		0.57	0.23
Incremental Delay, d2	0.2	0.2			16.6	0.1		1.6	1.2		0.4	0.9
Delay (s)	30.3	31.6			49.9	56.4		43.3	26.7		21.5	5.0
Level of Service	C	C			D	E		D	C		C	A
Approach Delay (s)		31.3			53.0				27.7			6.4
Approach LOS		C			D				C			A

Intersection Summary				
HCM 2000 Control Delay		22.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio		0.77		
Actuated Cycle Length (s)		100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization		99.2%	ICU Level of Service	F
Analysis Period (min)		15		

c Critical Lane Group

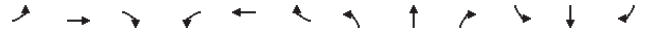
Movement	SBR
Lane Configurations	
Volume (vph)	1
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	1
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	13
Confl. Bikes (#/hr)	17
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	333	5	11	308	17	25	3	13	63	4	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.95			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			0.94	
Frt		1.00			0.99			0.96			0.93	
Flt Protected		1.00			1.00			0.97			0.98	
Satd. Flow (prot)		3513			3556			1452			1617	
Flt Permitted		0.94			0.94			0.87			0.89	
Satd. Flow (perm)		3323			3357			1301			1470	
Peak-hour factor, PHF	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. Flow (vph)	17	333	5	11	308	17	25	3	13	63	4	73
RTOR Reduction (vph)	0	2	0	0	8	0	0	7	0	0	39	0
Lane Group Flow (vph)	0	353	0	0	328	0	0	34	0	0	101	0
Confl. Peds. (#/hr)	25		59	59		25			208	208		
Confl. Bikes (#/hr)			10			6						1
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Prot	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases				6			4			8		
Actuated Green, G (s)		21.0			14.0			23.0			23.0	
Effective Green, g (s)		21.0			14.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.28			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1410			939			598			676	
v/s Ratio Prot		c0.02										
v/s Ratio Perm		0.09			c0.10			0.03			c0.07	
v/c Ratio		0.25			0.35			0.06			0.15	
Uniform Delay, d1		9.4			14.4			7.5			7.8	
Progression Factor		1.64			1.00			1.00			1.00	
Incremental Delay, d2		0.4			1.0			0.2			0.5	
Delay (s)		15.8			15.4			7.7			8.3	
Level of Service		B			B			A			A	
Approach Delay (s)		15.8			15.4			7.7			8.3	
Approach LOS		B			B			A			A	

Intersection Summary					
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.23				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		9.0	
Intersection Capacity Utilization	47.9%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis — Children's Hospital
12: 52nd Street & Dover Street — Existing PM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	382	7	5	326	26	5	2	8	36	1	13
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	18	382	7	5	326	26	5	2	8	36	1	13
Pedestrians		37			7			35			15	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			1			3			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.93			0.90			0.93	0.93	0.90	0.93	0.93	0.93
vC, conflicting volume	367			424			856	834	428	802	824	391
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	276			299			631	607	303	572	597	302
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	98			100			98	99	99	90	100	98
cM capacity (veh/h)	1171			1103			313	351	621	372	368	658

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	407	357	15	50
Volume Left	18	5	5	36
Volume Right	7	26	8	13
cSH	1171	1103	434	420
Volume to Capacity	0.02	0.00	0.03	0.12
Queue Length 95th (ft)	1	0	3	10
Control Delay (s)	0.5	0.2	13.6	14.7
Lane LOS	A	A	B	B
Approach Delay (s)	0.5	0.2	13.6	14.7
Approach LOS			B	B

Intersection Summary					
Average Delay	1.5				
Intersection Capacity Utilization	49.0%	ICU Level of Service		A	
Analysis Period (min)	15				

HCM Unsignalized Intersection Capacity Analysis — Children's Hospital
13: SR-24 NB Off-Ramp & 52nd Street — Existing PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	423	0	0	364	996	0	1024	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	423	0	0	364	996	0	1024	0	0
Pedestrians							33		9	
Lane Width (ft)							12.0		0.0	
Walking Speed (ft/s)							4.0		4.0	
Percent Blockage							3		0	
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.84						0.84		0.84	0.84
vC, conflicting volume	1369			456			1825	244	1608	829
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1057			456			1600	244	1342	413
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	549			1071			86	732	0	431

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	212	212	243	453	664	512	512
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	332	664	512	512
cSH	1700	1700	1700	1700	1700	732	732
Volume to Capacity	0.12	0.12	0.14	0.27	0.39	0.70	0.70
Queue Length 95th (ft)	0	0	0	0	0	144	144
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	20.5	20.5
Lane LOS						C	C
Approach Delay (s)	0.0		0.0			20.5	
Approach LOS						C	

Intersection Summary					
Average Delay	7.5				
Intersection Capacity Utilization	55.3%	ICU Level of Service		B	
Analysis Period (min)	15				

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	40	302	913	172	35	829	129	146	207	40	140	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.99		1.00	0.99		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			0.99
Frt		1.00	0.98		1.00	0.98		1.00	0.98			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.98
Satd. Flow (prot)		1787	4955		1805	5037		1747	1783			1716
Flt Permitted		0.95	1.00		0.95	1.00		0.30	1.00			0.72
Satd. Flow (perm)		1787	4955		1805	5037		554	1783			1268
Peak-hour factor, PHF	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. Flow (vph)	40	302	913	172	35	829	129	146	207	40	140	143
RTOR Reduction (vph)	0	0	23	0	0	19	0	0	6	0	0	0
Lane Group Flow (vph)	0	342	1062	0	35	939	0	146	241	0	0	283
Confl. Peds. (#/hr)		11		14	14		11	18		22	22	
Confl. Bikes (#/hr)				13			8			30		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		33.5	57.2		3.9	27.6		34.9	34.9			25.4
Effective Green, g (s)		33.5	57.2		3.9	27.6		34.9	34.9			25.4
Actuated g/C Ratio		0.30	0.52		0.04	0.25		0.32	0.32			0.23
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		544	2576		63	1263		235	565			292
v/s Ratio Prot		c0.19	0.21		0.02	c0.19		c0.03	0.14			
v/s Ratio Perm								0.17				c0.22
v/c Ratio		0.63	0.41		0.56	0.74		0.62	0.43			0.97
Uniform Delay, d1		32.9	16.1		52.2	37.9		31.3	29.6			41.9
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Incremental Delay, d2		5.4	0.5		10.2	4.0		5.0	2.3			45.4
Delay (s)		38.3	16.6		62.4	41.9		36.4	32.0			87.3
Level of Service		D	B		E	D		D	C			F
Approach Delay (s)			21.8			42.7			33.6			59.2
Approach LOS			C			D			C			E

Intersection Summary			
HCM 2000 Control Delay	36.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	99.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	346
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.94
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1421
Flt Permitted	1.00
Satd. Flow (perm)	1421
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	346
RTOR Reduction (vph)	266
Lane Group Flow (vph)	80
Confl. Peds. (#/hr)	18
Confl. Bikes (#/hr)	27
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	25.4
Effective Green, g (s)	25.4
Actuated g/C Ratio	0.23
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	328
v/s Ratio Prot	
v/s Ratio Perm	0.06
v/c Ratio	0.24
Uniform Delay, d1	34.5
Progression Factor	1.00
Incremental Delay, d2	1.8
Delay (s)	36.2
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis — Children's Hospital
15: Telegraph Ave & 52nd Street/Claremont Ave — Existing PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	13	7	13	99	72	157	14	885	224	101	666	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.95			0.99		1.00	0.93	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.95		1.00	0.90			0.97		1.00	0.96	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1623		1698	1532			3801		1770	3149	
Flt Permitted		0.98		0.95	1.00			0.94		0.95	1.00	
Satd. Flow (perm)		1623		1698	1532			3570		1770	3149	
Peak-hour factor, PHF	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. Flow (vph)	13	7	13	99	72	157	14	885	224	101	666	280
RTOR Reduction (vph)	0	12	0	0	74	0	0	17	0	0	36	0
Lane Group Flow (vph)	0	21	0	89	165	0	0	1106	0	101	910	0
Confl. Peds. (#/hr)	34					34	70		22	22		70
Confl. Bikes (#/hr)			1			10			35			48
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		4.6		16.9	16.9			51.2		9.3	65.0	
Effective Green, g (s)		4.6		16.9	16.9			51.2		9.3	65.0	
Actuated g/C Ratio		0.05		0.17	0.17			0.51		0.09	0.65	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		74		286	258			1827		164	2046	
v/s Ratio Prot		c0.01		0.05	c0.11					c0.06	0.29	
v/s Ratio Perm								c0.31				
v/c Ratio		0.28		0.31	0.64			0.61		0.62	0.44	
Uniform Delay, d1		46.1		36.4	38.7			17.3		43.6	8.6	
Progression Factor		1.86		1.00	1.00			0.61		1.00	1.00	
Incremental Delay, d2		1.2		0.6	5.1			1.1		6.7	0.7	
Delay (s)		87.0		37.1	43.9			11.6		50.3	9.3	
Level of Service		F		D	D			B		D	A	
Approach Delay (s)		87.0			42.0			11.6			13.3	
Approach LOS		F			D			B			B	

Intersection Summary				
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	88.5%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis — Children's Hospital
16: Telegraph Ave & 51St Street — Existing PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	348	607	84	56	477	229	78	574	97	262	475	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.97		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3403		1787	3314		1719	3311		1752	3401	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3403		1787	3314		1719	3311		1752	3401	
Peak-hour factor, PHF	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. Flow (vph)	348	607	84	56	477	229	78	574	97	262	475	44
RTOR Reduction (vph)	0	10	0	0	57	0	0	13	0	0	6	0
Lane Group Flow (vph)	348	681	0	56	649	0	78	658	0	262	513	0
Confl. Peds. (#/hr)	38		52	52		38	92		57	57		92
Confl. Bikes (#/hr)			8			15			34			54
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.9	30.3		7.4	23.3		5.8	32.8		13.0	41.0	
Effective Green, g (s)	14.9	30.3		7.4	23.3		5.8	32.8		13.0	41.0	
Actuated g/C Ratio	0.15	0.30		0.07	0.23		0.06	0.33		0.13	0.41	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	506	1031		132	772		99	1086		227	1394	
v/s Ratio Prot	c0.10	0.20		0.03	c0.20		0.05	c0.20		c0.15	0.15	
v/s Ratio Perm												
v/c Ratio	0.69	0.66		0.42	0.84		0.79	0.61		1.15	0.37	
Uniform Delay, d1	40.3	30.4		44.3	36.6		46.5	28.2		43.5	20.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.18	0.73	
Incremental Delay, d2	3.9	3.3		2.2	10.7		32.8	2.5		105.5	0.7	
Delay (s)	44.2	33.7		46.5	47.3		79.3	30.7		157.0	15.6	
Level of Service	D	C		D	D		E	C		F	B	
Approach Delay (s)		37.2			47.2			35.7			63.0	
Approach LOS		D			D			D			E	

Intersection Summary				
HCM 2000 Control Delay	45.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	79.3%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis — Children's Hospital
17: SB SR-24 On-Ramp & MLK Way & NB SR-24 Off-Ramp — Existing PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	268	0	0	0	0	1614	0	0	0	0	1547	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	268	0	0	0	0	1614	0	0	0	0	1547	235
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	268	0	0	0	0	1614	0	0	0	0	1547	235
Confl. Peds. (#/hr)			2	2			18					18
Confl. Bikes (#/hr)									9			12
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	13.0					50.0					29.0	50.0
Effective Green, g (s)	13.0					50.0					29.0	50.0
Actuated g/C Ratio	0.26					1.00					0.58	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	850					1627					2072	2814
v/s Ratio Prot	0.08										0.43	0.08
v/s Ratio Perm						c0.99						
v/c Ratio	0.32					0.99					0.75	0.08
Uniform Delay, d1	14.9					0.0					7.8	0.0
Progression Factor	1.00					1.00					2.66	1.00
Incremental Delay, d2	1.0					20.5					2.1	0.0
Delay (s)	15.9					20.5					22.8	0.0
Level of Service	B					C					C	A
Approach Delay (s)		15.9			20.5			0.0			19.8	
Approach LOS		B			C			A			B	

Intersection Summary				
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	1.18			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	57.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis — Children's Hospital
18: West Street & 52nd Street — Existing PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	112	8	83	94	0	43	0	134	6	52	4
Peak Hour 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
Hourly flow rate (vph)	0	112	8	83	94	0	43	0	134	6	52	4

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	120	177	43	134	62
Volume Left (vph)	0	83	43	0	6
Volume Right (vph)	8	0	0	134	4
Hadj (s)	-0.02	0.13	0.50	-0.70	0.01
Departure Headway (s)	4.7	4.8	5.8	4.6	5.0
Degree Utilization, x	0.16	0.23	0.07	0.17	0.09
Capacity (veh/h)	717	715	588	736	667
Control Delay (s)	8.5	9.2	8.0	7.3	8.4
Approach Delay (s)	8.5	9.2	7.5		8.4
Approach LOS	A	A	A		A

Intersection Summary			
Delay	8.4		
Level of Service	A		
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	1	110	2	2	97	36	2	0	3	11	0	3
Peak Hour 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
Hourly flow rate (vph)	1	110	2	2	97	36	2	0	3	11	0	3

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	113	135	5	14
Volume Left (vph)	1	2	2	11
Volume Right (vph)	2	36	3	3
Hadj (s)	0.01	-0.16	-0.28	0.03
Departure Headway (s)	4.1	3.9	4.1	4.4
Degree Utilization, x	0.13	0.15	0.01	0.02
Capacity (veh/h)	869	912	809	753
Control Delay (s)	7.7	7.6	7.2	7.5
Approach Delay (s)	7.7	7.6	7.2	7.5
Approach LOS	A	A	A	A

Intersection Summary				
Delay			7.6	
Level of Service			A	
Intersection Capacity Utilization			20.3%	ICU Level of Service
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	12	370	1	10	338	29	8	18	29	27	3	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	12	370	1	10	338	29	8	18	29	27	3	10
Pedestrians		5						7			3	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	370			378			790	792	378	808	778	360
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	370			378			790	792	378	808	778	360
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			97	94	96	90	99	99
cM capacity (veh/h)	1191			1185			294	315	670	268	319	679

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	383	377	55	40
Volume Left	12	10	8	27
Volume Right	1	29	29	10
cSH	1191	1185	431	320
Volume to Capacity	0.01	0.01	0.13	0.12
Queue Length 95th (ft)	1	1	11	11
Control Delay (s)	0.4	0.3	14.6	17.8
Lane LOS	A	A	B	C
Approach Delay (s)	0.4	0.3	14.6	17.8
Approach LOS			B	C

Intersection Summary				
Average Delay			2.1	
Intersection Capacity Utilization			40.3%	ICU Level of Service
Analysis Period (min)			15	

Appendix C

LOS Calculation Worksheets – 2020 No Project Conditions

FEHR PEERS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	20	180	230	60	240	80	20	150	1380	60	90	1330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			0.99			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.93			0.97			1.00	0.99		1.00	0.99
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1703			1747			1770	5036		1770	5046
Flt Permitted		0.98			0.77			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1664			1360			1770	5036		1770	5046
Peak-hour factor, PHF	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. Flow (vph)	20	180	230	60	240	80	20	150	1380	60	90	1330
RTOR Reduction (vph)	0	52	0	0	12	0	0	0	4	0	0	4
Lane Group Flow (vph)	0	378	0	0	368	0	0	170	1436	0	90	1376
Confl. Peds. (#/hr)	10		19	19		10				28		
Confl. Bikes (#/hr)			21			20				8		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		27.7			27.7			14.4	41.8		6.0	33.4
Effective Green, g (s)		27.7			27.7			14.4	41.8		6.0	33.4
Actuated g/C Ratio		0.31			0.31			0.16	0.46		0.07	0.37
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		512			418			283	2338		118	1872
v/s Ratio Prot								0.10	c0.29		0.05	c0.27
v/s Ratio Perm		0.23			c0.27							
v/c Ratio		0.74			0.88			0.60	0.61		0.76	0.74
Uniform Delay, d1		27.9			29.6			35.1	18.1		41.3	24.5
Progression Factor		1.00			1.00			0.54	0.20		1.00	1.00
Incremental Delay, d2		5.5			19.0			3.3	1.1		24.8	2.6
Delay (s)		33.4			48.6			22.1	4.7		66.1	27.1
Level of Service		C			D			C	A		E	C
Approach Delay (s)		33.4			48.6				6.6			29.5
Approach LOS		C			D				A			C

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	50
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	50
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	16
Confl. Bikes (#/hr)	10
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	290	10	30	320	10	10	10	20	10	10	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	290	10	30	320	10	10	10	20	10	10	30
Pedestrians		12			26			20			8	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			2			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked	0.91						0.91	0.91		0.91	0.91	0.91
vC, conflicting volume	338			320			807	773	341	799	773	345
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	220			320			737	699	341	728	699	228
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			96	97	97	96	97	96
cM capacity (veh/h)	1201			1208			263	309	679	267	306	722

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	330	360	40	50
Volume Left	30	30	10	10
Volume Right	10	10	20	30
cSH	1201	1208	401	447
Volume to Capacity	0.02	0.02	0.10	0.11
Queue Length 95th (ft)	2	2	8	9
Control Delay (s)	1.0	0.9	15.0	14.1
Lane LOS	A	A	B	B
Approach Delay (s)	1.0	0.9	15.0	14.1
Approach LOS			B	B

Intersection Summary					
Average Delay			2.5		
Intersection Capacity Utilization			40.9%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
2020 AM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	220	60	30	270	50	40	460	30	30	570	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.99			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.99			0.99	
Flt Protected		0.99			1.00			1.00			1.00	
Satd. Flow (prot)		1724			1787			1836			1855	
Flt Permitted		0.85			0.96			0.93			0.96	
Satd. Flow (perm)		1484			1722			1710			1792	
Peak-hour factor, PHF	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. Flow (vph)	60	220	60	30	270	50	40	460	30	30	570	40
RTOR Reduction (vph)	0	10	0	0	8	0	0	3	0	0	3	0
Lane Group Flow (vph)	0	330	0	0	342	0	0	527	0	0	637	0
Confl. Peds. (#/hr)	8		17	17		8	10		23	23		10
Confl. Bikes (#/hr)			29			13			17			32
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		25.0			25.0			47.0			47.0	
Effective Green, g (s)		25.0			25.0			47.0			47.0	
Actuated g/C Ratio		0.31			0.31			0.59			0.59	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		463			538			1004			1052	
v/s Ratio Prot												
v/s Ratio Perm		c0.22			0.20			0.31			c0.36	
v/c Ratio		0.71			0.64			0.53			0.61	
Uniform Delay, d1		24.3			23.6			9.8			10.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		9.0			5.7			2.0			2.6	
Delay (s)		33.4			29.3			11.8			13.2	
Level of Service		C			C			B			B	
Approach Delay (s)		33.4			29.3			11.8			13.2	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	80.2%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
2020 AM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	20	90	40	10	10	70	850	50	40	980	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	0.99		1.00	0.98	
Flpb, ped/bikes		1.00			0.99		1.00	1.00		0.99	1.00	
Frt		0.95			0.98		1.00	0.99		1.00	0.97	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1645			1709		1762	3491		1767	3409	
Flt Permitted		0.79			0.76		0.17	1.00		0.28	1.00	
Satd. Flow (perm)		1334			1337		317	3491		522	3409	
Peak-hour factor, PHF	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. Flow (vph)	150	20	90	40	10	10	70	850	50	40	980	260
RTOR Reduction (vph)	0	32	0	0	8	0	0	5	0	0	26	0
Lane Group Flow (vph)	0	228	0	0	53	0	70	895	0	40	1214	0
Confl. Peds. (#/hr)	8		15	15		8	17		23	23		17
Confl. Bikes (#/hr)			20			20			56			36
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		17.5			17.5		43.5	43.5		43.5	43.5	
Effective Green, g (s)		17.5			17.5		43.5	43.5		43.5	43.5	
Actuated g/C Ratio		0.25			0.25		0.62	0.62		0.62	0.62	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		333			334		196	2169		324	2118	
v/s Ratio Prot								0.26			c0.36	
v/s Ratio Perm		c0.17			0.04		0.22			0.08		
v/c Ratio		0.68			0.16		0.36	0.41		0.12	0.57	
Uniform Delay, d1		23.7			20.5		6.4	6.7		5.4	7.8	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.7			0.2		5.0	0.6		0.8	1.1	
Delay (s)		29.5			20.7		11.5	7.3		6.2	8.9	
Level of Service		C			C		B	A		A	A	
Approach Delay (s)		29.5			20.7			7.6			8.8	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	68.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

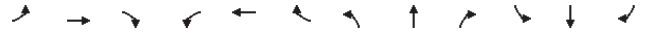
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	10	10	50	10	10	10	10	20	1560	20	20	1590
Sign Control		Stop			Stop				Free			Free
Grade		0%			0%				0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	10	50	10	10	10	0	20	1560	20	20	1590
Pedestrians		10			8				11			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		1			1				1			
Right turn flare (veh)												
Median type									None			None
Median storage veh)												
Upstream signal (ft)									299			294
pX, platoon unblocked	0.85	0.85	0.77	0.85	0.85	0.84	0.00	0.77			0.84	
vC, conflicting volume	2220	3273	556	2254	3268	538	0	1610			1588	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	527	1761	0	567	1756	0	0	751			1015	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	0.0	2.2			2.2	
p0 queue free %	97	85	94	96	85	99	0	97			96	
cM capacity (veh/h)	306	67	826	270	68	906	0	653			568	

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	70	30	410	780	410	418	795	408
Volume Left	10	10	20	0	0	20	0	0
Volume Right	50	10	0	0	20	0	0	10
cSH	289	153	653	1700	1700	568	1700	1700
Volume to Capacity	0.24	0.20	0.03	0.46	0.24	0.04	0.47	0.24
Queue Length 95th (ft)	23	17	2	0	0	3	0	0
Control Delay (s)	21.4	34.2	0.9	0.0	0.0	1.1	0.0	0.0
Lane LOS	C	D	A			A		
Approach Delay (s)	21.4	34.2	0.2			0.3		
Approach LOS	C	D						

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	66.3%	ICU Level of Service		C
Analysis Period (min)	15			

Movement	SBR
Lane Configurations	
Volume (veh/h)	10
Sign Control	
Grade	
Peak Hour Factor	1.00
Hourly flow rate (vph)	10
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	
tC, single (s)	
tC, 2 stage (s)	
tF (s)	
p0 queue free %	
cM capacity (veh/h)	

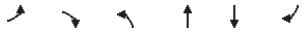
Direction, Lane #



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	10	10	10	10	10	10	20	20	10	40	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	10	10	10	10	10	10	20	20	10	40	10
Pedestrians		13			19			3			8	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	151	157	61	152	152	57	63			59		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	151	157	61	152	152	57	63			59		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	99	99	99	99	99			99		
cM capacity (veh/h)	767	710	996	765	714	992	1536			1533		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	30	30	50	60
Volume Left	10	10	10	10
Volume Right	10	10	20	10
cSH	807	807	1536	1533
Volume to Capacity	0.04	0.04	0.01	0.01
Queue Length 95th (ft)	3	3	0	0
Control Delay (s)	9.6	9.6	1.5	1.3
Lane LOS	A	A	A	A
Approach Delay (s)	9.6	9.6	1.5	1.3
Approach LOS	A	A		

Intersection Summary				
Average Delay	4.3			
Intersection Capacity Utilization	21.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	20	20	520	630	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	20	20	520	630	10
Pedestrians	12			3	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.79	0.79	0.79			
vC, conflicting volume	1209	650	652			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1130	420	423			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	96	98			
cM capacity (veh/h)	173	495	886			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	30	540	640
Volume Left	10	20	0
Volume Right	20	0	10
cSH	305	886	1700
Volume to Capacity	0.10	0.02	0.38
Queue Length 95th (ft)	8	2	0
Control Delay (s)	18.1	0.6	0.0
Lane LOS	C	A	
Approach Delay (s)	18.1	0.6	0.0
Approach LOS	C		

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	54.5%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
8: MLK Way & 53rd Street

Children's Hospital
2020 AM No Project

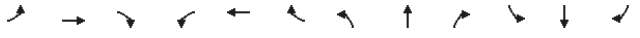
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	40	20	10	20	30	1590	30	20	1650	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.98			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.91			0.95		1.00	1.00		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1653			1742		1770	5065		1787	5128	
Flt Permitted		0.96			0.88		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1595			1569		1770	5065		1787	5128	
Peak-hour factor, PHF	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. Flow (vph)	10	10	40	20	10	20	30	1590	30	20	1650	10
RTOR Reduction (vph)	0	33	0	0	16	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	27	0	0	34	0	30	1619	0	20	1660	0
Confl. Peds. (#/hr)	10		17	17		10			17			26
Confl. Bikes (#/hr)									7			17
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		15.8			15.8		4.5	58.1		3.6	57.2	
Effective Green, g (s)		15.8			15.8		4.5	58.1		3.6	57.2	
Actuated g/C Ratio		0.18			0.18		0.05	0.65		0.04	0.64	
Clearance Time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		280			275		88	3269		71	3259	
v/s Ratio Prot							0.02	c0.32		0.01	c0.32	
v/s Ratio Perm		0.02			c0.02							
v/c Ratio		0.10			0.12		0.34	0.50		0.28	0.51	
Uniform Delay, d1		31.1			31.3		41.3	8.3		41.9	8.8	
Progression Factor		1.00			1.02		1.17	0.41		0.53	0.25	
Incremental Delay, d2		0.2			0.2		1.8	0.4		1.6	0.4	
Delay (s)		31.3			32.1		50.3	3.8		23.9	2.7	
Level of Service		C			C		D	A		C	A	
Approach Delay (s)		31.3			32.1			4.7			2.9	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	4.7	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.44			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5	
Intersection Capacity Utilization	56.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
9: Dover Street & 53rd Street

Children's Hospital
2020 AM No Project



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	10	30	10	10	10	20	30	20	10	30	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	20	10	30	10	10	10	20	30	20	10	30	20
Pedestrians		29			28			3			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			2			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	187	207	72	206	207	71	79			78		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	187	207	72	206	207	71	79			78		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	98	97	99	98	99	99			99		
cM capacity (veh/h)	703	648	969	670	648	971	1495			1497		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	60	30	70	60
Volume Left	20	10	20	10
Volume Right	30	10	20	20
cSH	802	738	1495	1497
Volume to Capacity	0.07	0.04	0.01	0.01
Queue Length 95th (ft)	6	3	1	1
Control Delay (s)	9.9	10.1	2.2	1.3
Lane LOS	A	B	A	A
Approach Delay (s)	9.9	10.1	2.2	1.3
Approach LOS	A	B		

Intersection Summary				
Average Delay	5.1			
Intersection Capacity Utilization	23.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	40	100	110	80	90	170	60	80	1430	150	10	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.96			1.00	0.97		1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00			0.98	1.00		1.00	1.00			1.00
Frt	1.00	0.92			1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00			0.98	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1772	1667			1786	1537		1787	5050			1787
Flt Permitted	0.59	1.00			0.67	1.00		0.95	1.00			0.95
Satd. Flow (perm)	1105	1667			1218	1537		1787	5050			1787
Peak-hour factor, PHF	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. Flow (vph)	40	100	110	80	90	170	60	80	1430	150	10	120
RTOR Reduction (vph)	0	50	0	0	0	127	0	0	12	0	0	0
Lane Group Flow (vph)	40	160	0	0	170	43	0	140	1568	0	0	130
Confl. Peds. (#/hr)	13		64	64		13				10		
Confl. Bikes (#/hr)			8			7				2		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	22.8	22.8			22.8	22.8		7.5	41.2			12.5
Effective Green, g (s)	22.8	22.8			22.8	22.8		7.5	41.2			12.5
Actuated g/C Ratio	0.25	0.25			0.25	0.25		0.08	0.46			0.14
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	279	422			308	389		148	2311			248
v/s Ratio Prot		0.10						c0.08	c0.31			0.07
v/s Ratio Perm	0.04				c0.14	0.03						
v/c Ratio	0.14	0.38			0.55	0.11		0.95	0.68			0.52
Uniform Delay, d1	26.0	27.8			29.2	25.8		41.0	19.2			36.0
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.07			0.78
Incremental Delay, d2	0.1	0.2			1.2	0.0		34.8	0.7			0.8
Delay (s)	26.1	28.0			30.4	25.9		75.7	21.3			28.9
Level of Service	C	C			C	C		E	C			C
Approach Delay (s)		27.7			28.1				25.7			
Approach LOS		C			C				C			

Intersection Summary			
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	94.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: MLK Way & 52nd Street

Children's Hospital
2020 AM No Project

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1570	0
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5136	
Flt Permitted	1.00	
Satd. Flow (perm)	5136	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1570	0
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1570	0
Confl. Peds. (#/hr)		13
Confl. Bikes (#/hr)		13
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	45.7	
Effective Green, g (s)	45.7	
Actuated g/C Ratio	0.51	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2607	
v/s Ratio Prot	c0.31	
v/s Ratio Perm		
v/c Ratio	0.60	
Uniform Delay, d1	15.7	
Progression Factor	0.77	
Incremental Delay, d2	0.9	
Delay (s)	13.0	
Level of Service	B	
Approach Delay (s)	14.2	
Approach LOS	B	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
11: 52nd Street & Garage

Children's Hospital
2020 AM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	112	230	8	6	300	82	15	7	10	13	2	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			0.99			0.94			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			0.92	
Frt		1.00			0.97			0.96			0.94	
Flt Protected		0.98			1.00			0.98			0.98	
Satd. Flow (prot)		3443			3438			1447			1598	
Flt Permitted		0.75			0.95			0.93			0.94	
Satd. Flow (perm)		2636			3268			1383			1532	
Peak-hour factor, PHF	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. Flow (vph)	112	230	8	6	300	82	15	7	10	13	2	13
RTOR Reduction (vph)	0	3	0	0	48	0	0	5	0	0	7	0
Lane Group Flow (vph)	0	347	0	0	340	0	0	27	0	0	21	0
Confl. Peds. (#/hr)	23		72	72		23			263	263		
Confl. Bikes (#/hr)			8			7						2
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Prot	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases				6			4			8		
Actuated Green, G (s)		21.0			14.0			23.0			23.0	
Effective Green, g (s)		21.0			14.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.28			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1171			915			636			704	
v/s Ratio Prot		c0.02										
v/s Ratio Perm		0.10			c0.10			c0.02			0.01	
v/c Ratio		0.30			0.37			0.04			0.03	
Uniform Delay, d1		9.6			14.5			7.4			7.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.6			1.2			0.1			0.1	
Delay (s)		10.2			15.6			7.6			7.5	
Level of Service		B			B			A			A	
Approach Delay (s)		10.2			15.6			7.6			7.5	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.18			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	52.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
12: 52nd Street & Dover Street

Children's Hospital
2020 AM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	230	1	11	360	40	3	0	7	40	3	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	230	1	11	360	40	3	0	7	40	3	30
Pedestrians		26			13			16			30	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			1			1			3	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.90			0.94			0.93	0.93	0.94	0.93	0.93	0.90
vC, conflicting volume	430			247			766	758	260	742	739	436
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	304			166			560	552	180	534	530	311
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	97			99			99	100	99	90	99	95
cM capacity (veh/h)	1091			1314			341	370	773	384	392	626

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	261	411	10	73
Volume Left	30	11	3	40
Volume Right	1	40	7	30
cSH	1091	1314	560	457
Volume to Capacity	0.03	0.01	0.02	0.16
Queue Length 95th (ft)	2	1	1	14
Control Delay (s)	1.2	0.3	11.5	14.4
Lane LOS	A	A	B	B
Approach Delay (s)	1.2	0.3	11.5	14.4
Approach LOS			B	B

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	44.8%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
13: SR-24 NB Off-Ramp & 52nd Street

Children's Hospital
2020 AM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	280	0	0	420	1140	0	970	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	280	0	0	420	1140	0	970	0	0
Pedestrians							32			
Lane Width (ft)							12.0			
Walking Speed (ft/s)							4.0			
Percent Blockage							3			
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.81						0.81		0.81	0.81
vC, conflicting volume	1560			312			1872	172	1530	732
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1222			312			1607	172	1185	200
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	459			1212			82	816	0	548

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	140	140	280	520	760	485	485
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	380	760	485	485
cSH	1700	1700	1700	1700	1700	816	816
Volume to Capacity	0.08	0.08	0.16	0.31	0.45	0.59	0.59
Queue Length 95th (ft)	0	0	0	0	0	100	100
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	15.7	15.7
Lane LOS						C	C
Approach Delay (s)	0.0		0.0			15.7	
Approach LOS						C	

Intersection Summary				
Average Delay	5.4			
Intersection Capacity Utilization	52.0%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
14: 52nd Street & Shattuck Ave

Children's Hospital
2020 AM No Project

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	50	290	750	160	40	950	110	170	130	40	110	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.99		1.00	1.00		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.97		1.00	0.98		1.00	0.96			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.98
Satd. Flow (prot)		1787	4933		1805	5084		1752	1766			1733
Flt Permitted		0.95	1.00		0.95	1.00		0.39	1.00			0.79
Satd. Flow (perm)		1787	4933		1805	5084		726	1766			1400
Peak-hour factor, PHF	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. Flow (vph)	50	290	750	160	40	950	110	170	130	40	110	160
RTOR Reduction (vph)	0	0	32	0	0	16	0	0	13	0	0	0
Lane Group Flow (vph)	0	340	878	0	40	1044	0	170	157	0	0	270
Confl. Peds. (#/hr)				16			7			13	13	
Confl. Bikes (#/hr)				16			2			13		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		21.5	35.0		5.1	18.6		35.9	35.9			25.4
Effective Green, g (s)		21.5	35.0		5.1	18.6		35.9	35.9			25.4
Actuated g/C Ratio		0.24	0.39		0.06	0.21		0.40	0.40			0.28
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		426	1918		102	1050		363	704			395
v/s Ratio Prot		c0.19	0.18		0.02	c0.21		c0.03	0.09			
v/s Ratio Perm								0.15				c0.19
v/c Ratio		0.80	0.46		0.39	0.99		0.47	0.22			0.68
Uniform Delay, d1		32.2	20.4		41.0	35.6		18.7	17.9			28.7
Progression Factor		1.00	1.00		1.14	0.84		1.00	1.00			1.00
Incremental Delay, d2		14.4	0.8		1.9	22.9		1.0	0.7			9.2
Delay (s)		46.6	21.2		48.6	53.1		19.6	18.6			38.0
Level of Service		D	C		D	D		B	B			D
Approach Delay (s)			28.1			52.9			19.1			31.4
Approach LOS			C			D			B			C

Intersection Summary				
HCM 2000 Control Delay	36.0	HCM 2000 Level of Service		D
HCM 2000 Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		18.0
Intersection Capacity Utilization	104.6%	ICU Level of Service		G
Analysis Period (min)	15			

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	390
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.93
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1398
Flt Permitted	1.00
Satd. Flow (perm)	1398
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	390
RTOR Reduction (vph)	280
Lane Group Flow (vph)	110
Confl. Peds. (#/hr)	21
Confl. Bikes (#/hr)	54
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	25.4
Effective Green, g (s)	25.4
Actuated g/C Ratio	0.28
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	394
v/s Ratio Prot	
v/s Ratio Perm	0.08
v/c Ratio	0.28
Uniform Delay, d1	25.2
Progression Factor	1.00
Incremental Delay, d2	1.8
Delay (s)	26.9
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	10	110	60	180	10	780	130	90	700	340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.98			0.99		1.00	0.96	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.95		1.00	0.89			0.98		1.00	0.95	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1641		1698	1565			3849		1770	3244	
Flt Permitted		0.98		0.95	1.00			0.94		0.95	1.00	
Satd. Flow (perm)		1641		1698	1565			3627		1770	3244	
Peak-hour factor, PHF	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. Flow (vph)	10	10	10	110	60	180	10	780	130	90	700	340
RTOR Reduction (vph)	0	10	0	0	119	0	0	11	0	0	46	0
Lane Group Flow (vph)	0	21	0	99	132	0	0	909	0	90	994	0
Confl. Peds. (#/hr)	6					6	29		24			29
Confl. Bikes (#/hr)			2			3			43			36
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		4.5		15.7	15.7			43.9		7.9	56.3	
Effective Green, g (s)		4.5		15.7	15.7			43.9		7.9	56.3	
Actuated g/C Ratio		0.05		0.17	0.17			0.49		0.09	0.63	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		82		296	273			1769		155	2029	
v/s Ratio Prot		c0.01		0.06	c0.08					0.05	c0.31	
v/s Ratio Perm								0.25				
v/c Ratio		0.25		0.33	0.48			0.51		0.58	0.49	
Uniform Delay, d1		41.1		32.6	33.5			15.8		39.5	9.1	
Progression Factor		1.56		1.00	1.00			0.96		1.00	1.00	
Incremental Delay, d2		1.0		0.7	1.4			0.9		5.4	0.8	
Delay (s)		65.2		33.2	34.8			16.1		44.9	9.9	
Level of Service		E		C	C			B		D	A	
Approach Delay (s)		65.2			34.4			16.1			12.7	
Approach LOS		E			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
16: Telegraph Ave & 51St Street

Children's Hospital
2020 AM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	270	530	80	120	560	270	110	380	70	180	590	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.98		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3404		1787	3322		1719	3313		1752	3433	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3404		1787	3322		1719	3313		1752	3433	
Peak-hour factor, PHF	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. Flow (vph)	270	530	80	120	560	270	110	380	70	180	590	50
RTOR Reduction (vph)	0	13	0	0	64	0	0	16	0	0	6	0
Lane Group Flow (vph)	270	597	0	120	766	0	110	434	0	180	634	0
Confl. Peds. (#/hr)			41			41			39			49
Confl. Bikes (#/hr)			12			10			36			36
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	12.0	27.0		10.4	25.9		8.9	24.5		11.6	28.2	
Effective Green, g (s)	12.0	27.0		10.4	25.9		8.9	24.5		11.6	28.2	
Actuated g/C Ratio	0.13	0.30		0.12	0.29		0.10	0.27		0.13	0.31	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	453	1021		206	955		169	901		225	1075	
v/s Ratio Prot	c0.08	0.18		0.07	c0.23		0.06	0.13		c0.10	c0.18	
v/s Ratio Perm												
v/c Ratio	0.60	0.58		0.58	0.80		0.65	0.48		0.80	0.59	
Uniform Delay, d1	36.7	26.7		37.7	29.7		39.1	27.4		38.1	26.0	
Progression Factor	1.24	0.93		1.00	1.00		1.00	1.00		1.29	0.74	
Incremental Delay, d2	1.9	2.2		4.2	7.1		8.7	1.8		16.7	2.2	
Delay (s)	47.5	27.1		41.9	36.7		47.7	29.3		65.8	21.3	
Level of Service	D	C		D	D		D	C		E	C	
Approach Delay (s)		33.3			37.4			32.9			31.1	
Approach LOS		C			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	33.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	75.0%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
17: SB SR-24 On-Ramp & MLK Way & NB SR-24 Off-Ramp

Children's Hospital
2020 AM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	0	0	0	0	1550	0	0	0	0	1520	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	190	0	0	0	0	1550	0	0	0	0	1520	250
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	190	0	0	0	0	1550	0	0	0	0	1520	250
Confl. Peds. (#/hr)				8								
Confl. Bikes (#/hr)									3			
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	8.0					45.0					29.0	45.0
Effective Green, g (s)	8.0					45.0					29.0	45.0
Actuated g/C Ratio	0.18					1.00					0.64	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	581					1627					2303	2814
v/s Ratio Prot	0.06										0.43	0.09
v/s Ratio Perm						c0.95						
v/c Ratio	0.33					0.95					0.66	0.09
Uniform Delay, d1	16.2					0.0					4.9	0.0
Progression Factor	1.00					1.00					1.76	1.00
Incremental Delay, d2	1.5					13.6					1.2	0.1
Delay (s)	17.6					13.6					9.9	0.1
Level of Service	B					B					A	A
Approach Delay (s)		17.6			13.6			0.0			8.5	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	11.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	1.16			
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	54.1%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	170	20	70	100	0	30	0	80	10	50	10
Peak Hour 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
Hourly flow rate (vph)	0	170	20	70	100	0	30	0	80	10	50	10

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	190	170	30	80	70
Volume Left (vph)	0	70	30	0	10
Volume Right (vph)	20	0	0	80	10
Hadj (s)	-0.05	0.12	0.50	-0.70	-0.02
Departure Headway (s)	4.5	4.7	5.9	4.7	5.0
Degree Utilization, x	0.24	0.22	0.05	0.11	0.10
Capacity (veh/h)	763	727	567	703	661
Control Delay (s)	8.9	9.0	8.1	7.1	8.5
Approach Delay (s)	8.9	9.0	7.4		8.5
Approach LOS	A	A	A		A

Intersection Summary					
Delay			8.6		
Level of Service			A		
Intersection Capacity Utilization			41.5%	ICU Level of Service	A
Analysis Period (min)			15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	160	10	10	100	30	10	0	10	20	10	10
Peak Hour 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
Hourly flow rate (vph)	10	160	10	10	100	30	10	0	10	20	10	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	180	140	20	40
Volume Left (vph)	10	10	10	20
Volume Right (vph)	10	30	10	10
Hadj (s)	-0.01	-0.11	-0.20	-0.05
Departure Headway (s)	4.2	4.1	4.4	4.6
Degree Utilization, x	0.21	0.16	0.02	0.05
Capacity (veh/h)	843	855	747	726
Control Delay (s)	8.3	7.9	7.6	7.8
Approach Delay (s)	8.3	7.9	7.6	7.8
Approach LOS	A	A	A	A

Intersection Summary					
Delay			8.0		
Level of Service			A		
Intersection Capacity Utilization			24.1%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis — Children's Hospital
20: Genoa Street & 55th Street — 2020 AM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	370	10	10	360	20	10	20	20	40	20	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	370	10	10	360	20	10	20	20	40	20	10
Pedestrians		11			3			13			15	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	395			393			829	823	391	833	818	396
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	395			393			829	823	391	833	818	396
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			96	93	97	84	93	98
cM capacity (veh/h)	1154			1164			259	298	653	253	298	639

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	390	390	50	70
Volume Left	10	10	10	40
Volume Right	10	20	20	10
cSH	1154	1164	367	291
Volume to Capacity	0.01	0.01	0.14	0.24
Queue Length 95th (ft)	1	1	12	23
Control Delay (s)	0.3	0.3	16.3	21.3
Lane LOS	A	A	C	C
Approach Delay (s)	0.3	0.3	16.3	21.3
Approach LOS			C	C

Intersection Summary				
Average Delay	2.8			
Intersection Capacity Utilization	42.1%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis — Children's Hospital
1: MLK Way & 55th Street — 2020 PM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	20	260	170	60	170	70	20	210	1650	100	130	1350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			0.99			1.00	0.99		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.95			0.97			1.00	0.99		1.00	1.00
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1751			1735			1770	5015		1770	5060
Flt Permitted		0.98			0.67			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1718			1181			1770	5015		1770	5060
Peak-hour factor, PHF	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. Flow (vph)	20	260	170	60	170	70	20	210	1650	100	130	1350
RTOR Reduction (vph)	0	24	0	0	12	0	0	0	6	0	0	2
Lane Group Flow (vph)	0	426	0	0	288	0	0	230	1744	0	130	1378
Confl. Peds. (#/hr)	15		20	20		15				26		
Confl. Bikes (#/hr)			21			16				20		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		29.3			29.3			21.5	45.5		10.7	34.7
Effective Green, g (s)		29.3			29.3			21.5	45.5		10.7	34.7
Actuated g/C Ratio		0.29			0.29			0.22	0.46		0.11	0.35
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		503			346			380	2281		189	1755
v/s Ratio Prot								0.13	c0.35		0.07	c0.27
v/s Ratio Perm		c0.25			0.24							
v/c Ratio		0.85			0.83			0.61	0.76		0.69	0.79
Uniform Delay, d1		33.2			33.1			35.4	22.8		43.0	29.3
Progression Factor		1.00			1.00			0.50	0.35		1.00	1.00
Incremental Delay, d2		12.5			15.6			2.3	2.2		10.0	3.6
Delay (s)		45.7			48.6			20.1	10.1		53.0	32.9
Level of Service		D			D			C	B		D	C
Approach Delay (s)		45.7			48.6				11.3			34.6
Approach LOS		D			D				B			C

Intersection Summary					
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C		
HCM 2000 Volume to Capacity ratio	0.82				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.5		
Intersection Capacity Utilization	92.5%	ICU Level of Service	F		
Analysis Period (min)	15				

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	30
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	30
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	16
Confl. Bikes (#/hr)	20
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	440	20	10	230	20	20	20	30	20	20	40
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	440	20	10	230	20	20	20	30	20	20	40
Pedestrians		6			17			10			23	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked												
vC, conflicting volume	273			470			836	813	477	850	813	269
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	273			470			836	813	477	850	813	269
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			92	93	95	91	93	95
cM capacity (veh/h)	1249			1072			244	296	579	232	293	749

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	490	260	70	80
Volume Left	30	10	20	20
Volume Right	20	20	30	40
cSH	1249	1072	348	385
Volume to Capacity	0.02	0.01	0.20	0.21
Queue Length 95th (ft)	2	1	18	19
Control Delay (s)	0.7	0.4	17.9	16.8
Lane LOS	A	A	C	C
Approach Delay (s)	0.7	0.4	17.9	16.8
Approach LOS			C	C

Intersection Summary				
Average Delay	3.4			
Intersection Capacity Utilization	52.3%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
2020 PM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	330	60	30	160	50	50	560	40	30	550	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.99			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.97			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		1745			1760			1833			1853	
Flt Permitted		0.90			0.93			0.92			0.96	
Satd. Flow (perm)		1580			1642			1696			1774	
Peak-hour factor, PHF	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. Flow (vph)	90	330	60	30	160	50	50	560	40	30	550	40
RTOR Reduction (vph)	0	6	0	0	12	0	0	3	0	0	3	0
Lane Group Flow (vph)	0	474	0	0	228	0	0	647	0	0	617	0
Confl. Peds. (#/hr)	15		15	15		15	25		10	10		25
Confl. Bikes (#/hr)			20			13			41			29
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		29.0			29.0			43.0			43.0	
Effective Green, g (s)		29.0			29.0			43.0			43.0	
Actuated g/C Ratio		0.36			0.36			0.54			0.54	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		572			595			911			953	
v/s Ratio Prot												
v/s Ratio Perm		c0.30			0.14			c0.38			0.35	
v/c Ratio		0.83			0.38			0.71			0.65	
Uniform Delay, d1		23.2			18.9			13.8			13.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		13.0			1.9			4.7			3.4	
Delay (s)		36.2			20.7			18.5			16.5	
Level of Service		D			C			B			B	
Approach Delay (s)		36.2			20.7			18.5			16.5	
Approach LOS		D			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	97.5%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
2020 PM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	240	30	120	50	20	20	90	1030	70	20	990	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.98			0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes		0.99			0.99		0.99	1.00		0.99	1.00	
Frt		0.96			0.97		1.00	0.99		1.00	0.98	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1637			1695		1750	3483		1773	3473	
Flt Permitted		0.78			0.74		0.19	1.00		0.19	1.00	
Satd. Flow (perm)		1313			1293		349	3483		354	3473	
Peak-hour factor, PHF	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. Flow (vph)	240	30	120	50	20	20	90	1030	70	20	990	110
RTOR Reduction (vph)	0	19	0	0	13	0	0	5	0	0	8	0
Lane Group Flow (vph)	0	371	0	0	77	0	90	1095	0	20	1092	0
Confl. Peds. (#/hr)	15		34	34		15	33		23	23		33
Confl. Bikes (#/hr)			11			12			38			59
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		29.7			29.7		51.3	51.3		51.3	51.3	
Effective Green, g (s)		29.7			29.7		51.3	51.3		51.3	51.3	
Actuated g/C Ratio		0.33			0.33		0.57	0.57		0.57	0.57	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		433			426		198	1985		201	1979	
v/s Ratio Prot								c0.31			0.31	
v/s Ratio Perm		c0.28			0.06		0.26			0.06		
v/c Ratio		0.86			0.18		0.45	0.55		0.10	0.55	
Uniform Delay, d1		28.2			21.5		11.2	12.1		8.8	12.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		15.2			0.2		7.4	1.1		1.0	1.1	
Delay (s)		43.3			21.7		18.6	13.2		9.8	13.3	
Level of Service		D			C		B	B		A	B	
Approach Delay (s)		43.3			21.7			13.7			13.2	
Approach LOS		D			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	76.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (veh/h)	10	10	50	20	10	10	10	40	1930	20	10	20
Sign Control		Stop			Stop				Free			
Grade		0%			0%				0%			
Peak Hour 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
Hourly flow rate (vph)	10	10	50	20	10	10	0	40	1930	20	0	20
Pedestrians		7			25				15			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		1			2				1			
Right turn flare (veh)												
Median type									None			
Median storage veh)												
Upstream signal (ft)									299			
pX, platoon unblocked	0.87	0.87	0.76	0.87	0.87	0.78	0.00	0.76			0.00	0.78
vC, conflicting volume	2335	3652	545	2668	3652	678	0	1567			0	1975
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	324	1841	0	707	1841	0	0	640			0	1278
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			0.0	4.1
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	0.0	2.2			0.0	2.2
p0 queue free %	98	83	94	90	83	99	0	94			0	95
cM capacity (veh/h)	409	58	814	202	58	837	0	710			0	418

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	70	40	522	965	502	405	770	405
Volume Left	10	20	40	0	0	20	0	0
Volume Right	50	10	0	0	20	0	0	20
cSH	270	141	710	1700	1700	418	1700	1700
Volume to Capacity	0.26	0.28	0.06	0.57	0.30	0.05	0.45	0.24
Queue Length 95th (ft)	25	27	4	0	0	4	0	0
Control Delay (s)	22.9	40.4	1.5	0.0	0.0	1.5	0.0	0.0
Lane LOS	C	E	A			A		
Approach Delay (s)	22.9	40.4	0.4			0.4		
Approach LOS	C	E						

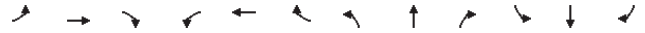
Intersection Summary				
Average Delay	1.3			
Intersection Capacity Utilization	88.1%	ICU Level of Service	E	
Analysis Period (min)	15			

Movement	SBT	SBR
Lane Configurations		
Volume (veh/h)	1540	20
Sign Control	Free	
Grade	0%	
Peak Hour Factor	1.00	1.00
Hourly flow rate (vph)	1540	20
Pedestrians		
Lane Width (ft)		
Walking Speed (ft/s)		
Percent Blockage		
Right turn flare (veh)		
Median type	None	
Median storage veh)		
Upstream signal (ft)	294	
pX, platoon unblocked		
vC, conflicting volume		
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol		
tC, single (s)		
tC, 2 stage (s)		
tF (s)		
p0 queue free %		
cM capacity (veh/h)		

Direction, Lane #

HCM Unsignalized Intersection Capacity Analysis
6: Dover Street & 54th Street

Children's Hospital
2020 PM No Project



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	20	10	10	10	20	10	40	10	10	30	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	20	10	10	10	20	10	40	10	10	30	10
Pedestrians		16			11			8			4	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	165	152	59	159	152	60	56			61		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	165	152	59	159	152	60	56			61		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	97	99	99	99	98	99			99		
cM capacity (veh/h)	746	717	992	753	717	999	1541			1541		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	40	40	60	50
Volume Left	10	10	10	10
Volume Right	10	20	10	10
cSH	779	847	1541	1541
Volume to Capacity	0.05	0.05	0.01	0.01
Queue Length 95th (ft)	4	4	0	0
Control Delay (s)	9.9	9.5	1.3	1.5
Lane LOS	A	A	A	A
Approach Delay (s)	9.9	9.5	1.3	1.5
Approach LOS	A	A		

Intersection Summary				
Average Delay	4.9			
Intersection Capacity Utilization	20.3%	ICU Level of Service	A	
Analysis Period (min)	15			

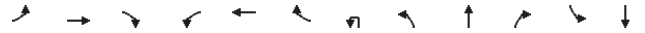
HCM Unsignalized Intersection Capacity Analysis
7: Shattuck Ave & 54th Street

Children's Hospital
2020 PM No Project

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	20	20	660	650	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	20	20	660	650	10
Pedestrians	33				2	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	3				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.82	0.77	0.77			
vC, conflicting volume	1390	688	693			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1110	444	451			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	96	98			
cM capacity (veh/h)	181	462	830			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	30	680	660
Volume Left	10	20	0
Volume Right	20	0	10
cSH	304	830	1700
Volume to Capacity	0.10	0.02	0.39
Queue Length 95th (ft)	8	2	0
Control Delay (s)	18.1	0.6	0.0
Lane LOS	C	A	
Approach Delay (s)	18.1	0.6	0.0
Approach LOS	C		

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	60.9%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	10	10	60	30	10	10	10	10	1980	30	20	1610
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.90			0.97			1.00	1.00		1.00	1.00
Flt Protected		0.99			0.97			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1631			1782			1770	5063		1787	5128
Flt Permitted		0.97			0.81			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1587			1490			1770	5063		1787	5128
Peak-hour factor, PHF	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. Flow (vph)	10	10	60	30	10	10	10	10	1980	30	20	1610
RTOR Reduction (vph)	0	50	0	0	8	0	0	0	1	0	0	0
Lane Group Flow (vph)	0	30	0	0	42	0	0	20	2009	0	20	1620
Confl. Peds. (#/hr)	11		6	6		11				42		
Confl. Bikes (#/hr)			6			3				17		
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		16.1			16.1			3.1	67.8		3.6	68.3
Effective Green, g (s)		16.1			16.1			3.1	67.8		3.6	68.3
Actuated g/C Ratio		0.16			0.16			0.03	0.68		0.04	0.68
Clearance Time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		255			239			54	3432		64	3502
v/s Ratio Prot								0.01	c0.40		0.01	c0.32
v/s Ratio Perm		0.02			c0.03							
v/c Ratio		0.12			0.17			0.37	0.59		0.31	0.46
Uniform Delay, d1		35.9			36.2			47.5	8.6		47.0	7.3
Progression Factor		1.00			1.06			1.46	0.14		0.78	0.48
Incremental Delay, d2		0.2			0.3			2.7	0.5		1.9	0.3
Delay (s)		36.1			38.9			71.9	1.7		38.5	3.8
Level of Service		D			D			E	A		D	A
Approach Delay (s)		36.1			38.9				2.3			4.2
Approach LOS		D			D				A			A

Intersection Summary			
HCM 2000 Control Delay	4.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: MLK Way & 53rd Street

Children's Hospital
2020 PM No Project

Movement	SBR
Lane Configurations	
Volume (vph)	10
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	10
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	19
Confl. Bikes (#/hr)	21
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis — Children's Hospital
9: Dover Street & 53rd Street — 2020 PM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	10	30	10	10	10	10	40	10	10	30	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	20	10	30	10	10	10	10	40	10	10	30	10
Pedestrians		33			13			6			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	174	171	74	174	171	64	73			63		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	174	171	74	174	171	64	73			63		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	99	97	99	99	99	99			99		
cM capacity (veh/h)	722	689	961	719	689	990	1497			1536		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	60	30	60	50
Volume Left	20	10	10	10
Volume Right	30	10	10	10
cSH	817	779	1497	1536
Volume to Capacity	0.07	0.04	0.01	0.01
Queue Length 95th (ft)	6	3	1	0
Control Delay (s)	9.8	9.8	1.3	1.5
Lane LOS	A	A	A	A
Approach Delay (s)	9.8	9.8	1.3	1.5
Approach LOS	A	A		

Intersection Summary				
Average Delay			5.2	
Intersection Capacity Utilization			23.5%	ICU Level of Service
Analysis Period (min)			15	

HCM Signalized Intersection Capacity Analysis — Children's Hospital
10: MLK Way & 52nd Street — 2020 PM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	70	130	100	130	100	200	50	90	1730	100	150	1550
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5		4.0	4.5
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91		1.00	0.91
Frpb, ped/bikes	1.00	0.96			1.00	0.96		1.00	1.00		1.00	1.00
Flpb, ped/bikes	0.99	1.00			0.97	1.00		1.00	1.00		1.00	1.00
Frt	1.00	0.93			1.00	0.85		1.00	0.99		1.00	1.00
Flt Protected	0.95	1.00			0.97	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1763	1685			1759	1525		1787	5082		1787	5128
Flt Permitted	0.48	1.00			0.55	1.00		0.95	1.00		0.95	1.00
Satd. Flow (perm)	887	1685			986	1525		1787	5082		1787	5128
Peak-hour factor, PHF	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. Flow (vph)	70	130	100	130	100	200	50	90	1730	100	150	1550
RTOR Reduction (vph)	0	30	0	0	0	148	0	0	6	0	0	1
Lane Group Flow (vph)	70	200	0	0	230	52	0	140	1824	0	150	1559
Confl. Peds. (#/hr)	21		80	80		21				13		
Confl. Bikes (#/hr)			12			6				20		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8		8						
Actuated Green, G (s)	26.1	26.1			26.1	26.1		12.0	42.9		17.5	47.9
Effective Green, g (s)	26.1	26.1			26.1	26.1		12.0	42.9		17.5	47.9
Actuated g/C Ratio	0.26	0.26			0.26	0.26		0.12	0.43		0.18	0.48
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5		4.0	4.5
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	231	439			257	398		214	2180		312	2456
v/s Ratio Prot		0.12						0.08	c0.36		0.08	c0.30
v/s Ratio Perm	0.08				c0.23	0.03						
v/c Ratio	0.30	0.46			0.89	0.13		0.65	0.84		0.48	0.63
Uniform Delay, d1	29.7	31.0			35.6	28.3		42.0	25.4		37.2	19.5
Progression Factor	1.00	1.00			0.93	1.84		0.97	1.06		0.56	0.27
Incremental Delay, d2	0.3	0.3			28.7	0.1		2.1	1.6		0.4	1.2
Delay (s)	29.9	31.3			62.0	52.0		42.7	28.6		21.2	6.4
Level of Service	C	C			E	D		D	C		C	A
Approach Delay (s)		31.0			57.4				29.6			7.7
Approach LOS		C			E				C			A

Intersection Summary				
HCM 2000 Control Delay		23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio		0.83		
Actuated Cycle Length (s)		100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization		103.7%	ICU Level of Service	G
Analysis Period (min)		15		

c Critical Lane Group

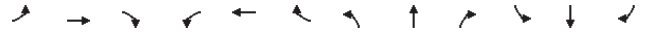
Movement	SBR
Lane Configurations	
Volume (vph)	10
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	10
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	17
Confl. Bikes (#/hr)	23
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	350	5	11	320	17	25	3	13	63	4	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.94			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			0.92	
Frt		1.00			0.99			0.96			0.93	
Flt Protected		1.00			1.00			0.97			0.98	
Satd. Flow (prot)		3516			3553			1432			1587	
Flt Permitted		0.94			0.94			0.87			0.89	
Satd. Flow (perm)		3327			3354			1284			1442	
Peak-hour factor, PHF	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. Flow (vph)	17	350	5	11	320	17	25	3	13	63	4	73
RTOR Reduction (vph)	0	2	0	0	7	0	0	7	0	0	39	0
Lane Group Flow (vph)	0	370	0	0	341	0	0	34	0	0	101	0
Confl. Peds. (#/hr)			77	77		33			271	271		
Confl. Bikes (#/hr)			13			8						2
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Prot	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases				6			4			8		
Actuated Green, G (s)		21.0			14.0			23.0			23.0	
Effective Green, g (s)		21.0			14.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.28			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1412			939			590			663	
v/s Ratio Prot		c0.02										
v/s Ratio Perm		0.09			c0.10			0.03			c0.07	
v/c Ratio		0.26			0.36			0.06			0.15	
Uniform Delay, d1		9.5			14.4			7.5			7.8	
Progression Factor		1.61			1.00			1.00			1.00	
Incremental Delay, d2		0.4			1.1			0.2			0.5	
Delay (s)		15.6			15.5			7.7			8.3	
Level of Service		B			B			A			A	
Approach Delay (s)		15.6			15.5			7.7			8.3	
Approach LOS		B			B			A			A	

Intersection Summary					
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.24				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		9.0	
Intersection Capacity Utilization	48.3%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis — Children's Hospital
12: 52nd Street & Dover Street — 2020 PM No Project



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	400	7	5	340	40	5	2	8	50	1	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	400	7	5	340	40	5	2	8	50	1	20
Pedestrians		49			10			46			20	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		4			1			4			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.91			0.89			0.93	0.93	0.89	0.93	0.93	0.91
vC, conflicting volume	400			453			949	920	460	872	903	429
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	288			322			688	657	329	607	639	320
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	97			100			98	99	99	85	100	97
cM capacity (veh/h)	1132			1063			273	321	588	345	339	621

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	437	385	15	71
Volume Left	30	5	5	50
Volume Right	7	40	8	20
cSH	1132	1063	393	394
Volume to Capacity	0.03	0.00	0.04	0.18
Queue Length 95th (ft)	2	0	3	16
Control Delay (s)	0.8	0.2	14.5	16.1
Lane LOS	A	A	B	C
Approach Delay (s)	0.8	0.2	14.5	16.1
Approach LOS			B	C

Intersection Summary					
Average Delay	2.0				
Intersection Capacity Utilization	58.8%	ICU Level of Service		B	
Analysis Period (min)	15				

HCM Unsignalized Intersection Capacity Analysis — Children's Hospital
13: SR-24 NB Off-Ramp & 52nd Street — 2020 PM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	460	0	0	390	1060	0	1050	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	460	0	0	390	1060	0	1050	0	0
Pedestrians							43			
Lane Width (ft)							12.0			
Walking Speed (ft/s)							4.0			
Percent Blockage							4			
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.82						0.82		0.82	0.82
vC, conflicting volume	1450			503			1953	273	1670	893
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1111			503			1724	273	1379	432
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	512			1020			70	696	0	407

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	230	230	260	483	707	525	525
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	353	707	525	525
cSH	1700	1700	1700	1700	1700	696	696
Volume to Capacity	0.14	0.14	0.15	0.28	0.42	0.75	0.75
Queue Length 95th (ft)	0	0	0	0	0	174	174
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	24.3	24.3
Lane LOS						C	C
Approach Delay (s)	0.0		0.0			24.3	
Approach LOS						C	

Intersection Summary					
Average Delay	8.6				
Intersection Capacity Utilization	56.6%	ICU Level of Service		B	
Analysis Period (min)	15				

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	50	320	950	190	60	880	150	160	240	60	150	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.98		1.00	0.99		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			0.99
Frt		1.00	0.97		1.00	0.98		1.00	0.97			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.98
Satd. Flow (prot)		1787	4930		1805	5012		1752	1764			1712
Flt Permitted		0.95	1.00		0.95	1.00		0.29	1.00			0.69
Satd. Flow (perm)		1787	4930		1805	5012		527	1764			1218
Peak-hour factor, PHF	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. Flow (vph)	50	320	950	190	60	880	150	160	240	60	150	150
RTOR Reduction (vph)	0	0	26	0	0	21	0	0	8	0	0	0
Lane Group Flow (vph)	0	370	1114	0	60	1009	0	160	292	0	0	300
Confl. Peds. (#/hr)				19	19		15			29	29	
Confl. Bikes (#/hr)				17			11			39		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		33.5	55.1		5.2	26.8		35.7	35.7			26.2
Effective Green, g (s)		33.5	55.1		5.2	26.8		35.7	35.7			26.2
Actuated g/C Ratio		0.30	0.50		0.05	0.24		0.32	0.32			0.24
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		544	2469		85	1221		232	572			290
v/s Ratio Prot		c0.21	0.23		0.03	c0.20		c0.03	0.17			
v/s Ratio Perm								0.19				c0.25
v/c Ratio		0.68	0.45		0.71	0.83		0.69	0.51			1.03
Uniform Delay, d1		33.6	17.7		51.6	39.4		32.2	30.1			41.9
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Incremental Delay, d2		6.7	0.6		23.3	6.5		8.3	3.2			62.1
Delay (s)		40.3	18.3		75.0	45.9		40.5	33.3			104.0
Level of Service		D	B		E	D		D	C			F
Approach Delay (s)			23.7			47.5			35.8			66.8
Approach LOS			C			D			D			E

Intersection Summary			
HCM 2000 Control Delay	39.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	104.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	360
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.93
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1400
Flt Permitted	1.00
Satd. Flow (perm)	1400
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	360
RTOR Reduction (vph)	274
Lane Group Flow (vph)	86
Confl. Peds. (#/hr)	24
Confl. Bikes (#/hr)	36
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	26.2
Effective Green, g (s)	26.2
Actuated g/C Ratio	0.24
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	333
v/s Ratio Prot	
v/s Ratio Perm	0.06
v/c Ratio	0.26
Uniform Delay, d1	34.0
Progression Factor	1.00
Incremental Delay, d2	1.9
Delay (s)	35.9
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
15: Telegraph Ave & 52nd Street/Claremont Ave

Children's Hospital
2020 PM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	20	20	140	80	180	20	1000	270	140	720	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.94			0.98		1.00	0.91	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.95		1.00	0.90			0.97		1.00	0.96	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1642		1698	1513			3777		1770	3089	
Flt Permitted		0.98		0.95	1.00			0.93		0.95	1.00	
Satd. Flow (perm)		1642		1698	1513			3505		1770	3089	
Peak-hour factor, PHF	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. Flow (vph)	20	20	20	140	80	180	20	1000	270	140	720	300
RTOR Reduction (vph)	0	19	0	0	73	0	0	21	0	0	38	0
Lane Group Flow (vph)	0	41	0	126	201	0	0	1269	0	140	982	0
Confl. Peds. (#/hr)	45					45	91		29			91
Confl. Bikes (#/hr)			2			13			46			63
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		6.2		18.0	18.0			45.9		11.9	62.3	
Effective Green, g (s)		6.2		18.0	18.0			45.9		11.9	62.3	
Actuated g/C Ratio		0.06		0.18	0.18			0.46		0.12	0.62	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		101		305	272			1608		210	1924	
v/s Ratio Prot		c0.03		0.07	c0.13					c0.08	0.32	
v/s Ratio Perm								c0.36				
v/c Ratio		0.41		0.41	0.74			0.79		0.67	0.51	
Uniform Delay, d1		45.1		36.3	38.8			23.0		42.2	10.4	
Progression Factor		1.80		1.00	1.00			0.57		1.00	1.00	
Incremental Delay, d2		1.2		0.9	10.0			2.7		7.8	1.0	
Delay (s)		82.6		37.2	48.8			15.8		49.9	11.4	
Level of Service		F		D	D			B		D	B	
Approach Delay (s)		82.6			45.2			15.8			16.0	
Approach LOS		F			D			B			B	

Intersection Summary				
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	100.7%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
16: Telegraph Ave & 51St Street

Children's Hospital
2020 PM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	360	660	100	70	520	240	100	690	120	280	540	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.97		1.00	0.98		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3384		1787	3299		1719	3293		1752	3363	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3384		1787	3299		1719	3293		1752	3363	
Peak-hour factor, PHF	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. Flow (vph)	360	660	100	70	520	240	100	690	120	280	540	60
RTOR Reduction (vph)	0	11	0	0	54	0	0	14	0	0	9	0
Lane Group Flow (vph)	360	749	0	70	706	0	100	796	0	280	591	0
Confl. Peds. (#/hr)			68			50			75			120
Confl. Bikes (#/hr)			11			20			45			71
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.1	29.9		8.0	23.3		7.8	32.6		13.0	38.8	
Effective Green, g (s)	15.1	29.9		8.0	23.3		7.8	32.6		13.0	38.8	
Actuated g/C Ratio	0.15	0.30		0.08	0.23		0.08	0.33		0.13	0.39	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	513	1011		142	768		134	1073		227	1304	
v/s Ratio Prot	c0.11	0.22		0.04	c0.21		0.06	c0.24		c0.16	0.18	
v/s Ratio Perm												
v/c Ratio	0.70	0.74		0.49	0.92		0.75	0.74		1.23	0.45	
Uniform Delay, d1	40.3	31.6		44.1	37.4		45.1	30.0		43.5	22.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.22	0.70	
Incremental Delay, d2	4.3	4.9		2.7	17.9		20.0	4.6		134.2	1.0	
Delay (s)	44.6	36.4		46.7	55.4		65.2	34.6		187.2	16.9	
Level of Service	D	D		D	E		E	C		F	B	
Approach Delay (s)		39.1			54.6			37.9			71.1	
Approach LOS		D			D			D			E	

Intersection Summary				
HCM 2000 Control Delay	49.8	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	86.5%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

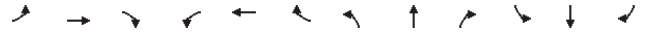
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	300	0	0	0	0	1670	0	0	0	0	1620	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	300	0	0	0	0	1670	0	0	0	0	1620	240
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	300	0	0	0	0	1670	0	0	0	0	1620	240
Confl. Peds. (#/hr)				3								
Confl. Bikes (#/hr)									12			
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	13.0					50.0					29.0	50.0
Effective Green, g (s)	13.0					50.0					29.0	50.0
Actuated g/C Ratio	0.26					1.00					0.58	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	850					1627					2072	2814
v/s Ratio Prot	0.09										0.45	0.09
v/s Ratio Perm						c1.03						
v/c Ratio	0.35					1.03					0.78	0.09
Uniform Delay, d1	15.1					25.0					8.1	0.0
Progression Factor	1.00					1.00					2.66	1.00
Incremental Delay, d2	1.2					29.3					2.4	0.0
Delay (s)	16.2					54.3					23.8	0.0
Level of Service	B					D					C	A
Approach Delay (s)		16.2			54.3			0.0			20.8	
Approach LOS		B			D			A			C	

Intersection Summary				
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.22			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	60.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	140	10	90	110	0	50	0	140	10	60	10
Peak Hour 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
Hourly flow rate (vph)	0	140	10	90	110	0	50	0	140	10	60	10

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	150	200	50	140	80
Volume Left (vph)	0	90	50	0	10
Volume Right (vph)	10	0	0	140	10
Hadj (s)	-0.02	0.12	0.50	-0.70	-0.02
Departure Headway (s)	4.8	4.9	6.0	4.8	5.1
Degree Utilization, x	0.20	0.27	0.08	0.19	0.11
Capacity (veh/h)	695	693	567	704	640
Control Delay (s)	9.0	9.7	8.3	7.7	8.8
Approach Delay (s)	9.0	9.7	7.8		8.8
Approach LOS	A	A	A		A

Intersection Summary				
Delay	8.8			
Level of Service	A			
Intersection Capacity Utilization	42.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	130	10	10	110	50	10	0	10	20	10	10
Peak Hour 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
Hourly flow rate (vph)	10	130	10	10	110	50	10	0	10	20	10	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	150	170	20	40
Volume Left (vph)	10	10	10	20
Volume Right (vph)	10	50	10	10
Hadj (s)	-0.01	-0.16	-0.20	-0.05
Departure Headway (s)	4.2	4.0	4.4	4.6
Degree Utilization, x	0.17	0.19	0.02	0.05
Capacity (veh/h)	837	874	748	727
Control Delay (s)	8.1	8.0	7.5	7.8
Approach Delay (s)	8.1	8.0	7.5	7.8
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.0	
Level of Service			A	
Intersection Capacity Utilization			23.5%	ICU Level of Service
Analysis Period (min)			15	
				A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	20	380	10	20	380	40	10	20	40	40	10	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	20	380	10	20	380	40	10	20	40	40	10	20
Pedestrians		7						10			4	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		1						1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	424			400			907	899	395	919	884	411
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	424			400			907	899	395	919	884	411
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			96	93	94	81	96	97
cM capacity (veh/h)	1137			1160			232	268	653	215	271	635

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	410	440	70	70
Volume Left	20	20	10	40
Volume Right	10	40	40	20
cSH	1137	1160	391	275
Volume to Capacity	0.02	0.02	0.18	0.25
Queue Length 95th (ft)	1	1	16	25
Control Delay (s)	0.6	0.5	16.2	22.5
Lane LOS	A	A	C	C
Approach Delay (s)	0.6	0.5	16.2	22.5
Approach LOS			C	C

Intersection Summary				
Average Delay			3.2	
Intersection Capacity Utilization			47.4%	ICU Level of Service
Analysis Period (min)			15	
				A

Appendix D

LOS Calculation Worksheets – 2035 No Project Conditions

FEHR PEERS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	20	200	250	60	270	100	20	180	1440	60	160	1520
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			0.99			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.93			0.97			1.00	0.99		1.00	0.99
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1702			1741			1770	5036		1770	5037
Flt Permitted		0.98			0.79			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1663			1383			1770	5036		1770	5037
Peak-hour factor, PHF	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. Flow (vph)	20	200	250	60	270	100	20	180	1440	60	160	1520
RTOR Reduction (vph)	0	50	0	0	13	0	0	0	5	0	0	5
Lane Group Flow (vph)	0	420	0	0	417	0	0	200	1495	0	160	1585
Confl. Peds. (#/hr)	11		21	21		11				32		
Confl. Bikes (#/hr)			24			23				9		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		29.4			29.4			13.5	38.6		7.5	32.6
Effective Green, g (s)		29.4			29.4			13.5	38.6		7.5	32.6
Actuated g/C Ratio		0.33			0.33			0.15	0.43		0.08	0.36
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		543			451			265	2159		147	1824
v/s Ratio Prot								0.11	c0.30		0.09	c0.31
v/s Ratio Perm		0.25			c0.30							
v/c Ratio		0.77			0.92			0.75	0.69		1.09	0.87
Uniform Delay, d1		27.3			29.2			36.7	20.9		41.2	26.7
Progression Factor		1.00			1.00			0.53	0.28		1.00	1.00
Incremental Delay, d2		6.8			24.5			10.4	1.7		99.9	5.9
Delay (s)		34.1			53.8			30.0	7.5		141.1	32.7
Level of Service		C			D			C	A		F	C
Approach Delay (s)		34.1			53.8				10.1			42.6
Approach LOS		C			D				B			D

Intersection Summary			
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	99.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	70
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	70
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	18
Confl. Bikes (#/hr)	11
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	370	10	30	370	10	10	10	20	10	10	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	370	10	30	370	10	10	10	20	10	10	30
Pedestrians		14			30			23			9	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			3			2			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked	0.89						0.89	0.89		0.89	0.89	0.89
vC, conflicting volume	389			403			942	907	428	934	907	398
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	256			403			875	836	428	866	836	266
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			97			95	96	97	95	96	96
cM capacity (veh/h)	1145			1123			205	252	604	208	249	675

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	410	410	40	50
Volume Left	30	30	10	10
Volume Right	10	10	20	30
cSH	1145	1123	329	377
Volume to Capacity	0.03	0.03	0.12	0.13
Queue Length 95th (ft)	2	2	10	11
Control Delay (s)	0.9	0.9	17.5	16.0
Lane LOS	A	A	C	C
Approach Delay (s)	0.9	0.9	17.5	16.0
Approach LOS			C	C

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	45.2%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
2035 AM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	260	80	40	290	70	50	520	30	30	620	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.98			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.97			0.98			0.99			0.99	
Flt Protected		0.99			1.00			1.00			1.00	
Satd. Flow (prot)		1715			1774			1837			1852	
Flt Permitted		0.77			0.92			0.91			0.96	
Satd. Flow (perm)		1339			1639			1675			1787	
Peak-hour factor, PHF	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. Flow (vph)	80	260	80	40	290	70	50	520	30	30	620	50
RTOR Reduction (vph)	0	10	0	0	10	0	0	2	0	0	3	0
Lane Group Flow (vph)	0	410	0	0	390	0	0	598	0	0	697	0
Confl. Peds. (#/hr)	9		20	20		9	11		26	26		11
Confl. Bikes (#/hr)			33			15			20			36
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		25.0			25.0			47.0			47.0	
Effective Green, g (s)		25.0			25.0			47.0			47.0	
Actuated g/C Ratio		0.31			0.31			0.59			0.59	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		418			512			984			1049	
v/s Ratio Prot												
v/s Ratio Perm		c0.31			0.24			0.36			c0.39	
v/c Ratio		0.98			0.76			0.61			0.66	
Uniform Delay, d1		27.3			24.8			10.6			11.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		39.3			10.3			2.8			3.3	
Delay (s)		66.6			35.1			13.4			14.5	
Level of Service		E			D			B			B	
Approach Delay (s)		66.6			35.1			13.4			14.5	
Approach LOS		E			D			B			B	

Intersection Summary				
HCM 2000 Control Delay	28.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	95.0%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
2035 AM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	180	20	100	50	10	10	80	1130	60	40	1340	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.98			0.99		1.00	0.99		1.00	0.98	
Flpb, ped/bikes		1.00			0.99		1.00	1.00		0.99	1.00	
Frt		0.95			0.98		1.00	0.99		1.00	0.97	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1645			1710		1770	3493		1775	3424	
Flt Permitted		0.78			0.72		0.10	1.00		0.18	1.00	
Satd. Flow (perm)		1314			1279		179	3493		329	3424	
Peak-hour factor, PHF	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. Flow (vph)	180	20	100	50	10	10	80	1130	60	40	1340	300
RTOR Reduction (vph)	0	20	0	0	7	0	0	4	0	0	23	0
Lane Group Flow (vph)	0	280	0	0	63	0	80	1186	0	40	1617	0
Confl. Peds. (#/hr)	9		17	17		9	20		26	26		20
Confl. Bikes (#/hr)			23			23			65			41
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		19.4			19.4		41.6	41.6		41.6	41.6	
Effective Green, g (s)		19.4			19.4		41.6	41.6		41.6	41.6	
Actuated g/C Ratio		0.28			0.28		0.59	0.59		0.59	0.59	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		364			354		106	2075		195	2034	
v/s Ratio Prot								0.34			c0.47	
v/s Ratio Perm		c0.21			0.05		0.45			0.12		
v/c Ratio		0.77			0.18		0.75	0.57		0.21	0.80	
Uniform Delay, d1		23.3			19.2		10.4	8.7		6.6	10.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		9.7			0.2		38.7	1.1		2.4	3.3	
Delay (s)		32.9			19.5		49.1	9.9		8.9	14.2	
Level of Service		C			B		D	A		A	B	
Approach Delay (s)		32.9			19.5			12.3			14.1	
Approach LOS		C			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	81.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

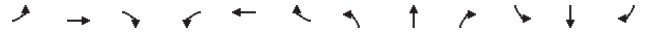
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	10	10	60	10	10	10	10	30	1670	20	20	1790
Sign Control		Stop			Stop				Free			Free
Grade		0%			0%				0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	10	60	10	10	10	0	30	1670	20	20	1790
Pedestrians		11			9				12			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		1			1				1			
Right turn flare (veh)												
Median type									None			None
Median storage veh)												
Upstream signal (ft)									299			294
pX, platoon unblocked	0.81	0.81	0.71	0.81	0.81	0.81	0.00	0.71			0.81	
vC, conflicting volume	2478	3605	625	2463	3600	576	0	1811			1699	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	437	1837	0	419	1831	0	0	727			1063	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	0.0	2.2			2.2	
p0 queue free %	97	82	92	97	82	99	0	95			96	
cM capacity (veh/h)	320	55	763	304	56	882	0	616			531	

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	80	30	448	835	438	468	895	458
Volume Left	10	10	30	0	0	20	0	0
Volume Right	60	10	0	0	20	0	0	10
cSH	276	135	616	1700	1700	531	1700	1700
Volume to Capacity	0.29	0.22	0.05	0.49	0.26	0.04	0.53	0.27
Queue Length 95th (ft)	29	20	4	0	0	3	0	0
Control Delay (s)	23.3	39.2	1.4	0.0	0.0	1.1	0.0	0.0
Lane LOS	C	E	A			A		
Approach Delay (s)	23.3	39.2	0.4			0.3		
Approach LOS	C	E						

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	76.5%	ICU Level of Service		D
Analysis Period (min)	15			

Movement	SBR
Lane Configurations	
Volume (veh/h)	10
Sign Control	
Grade	
Peak Hour Factor	1.00
Hourly flow rate (vph)	10
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	
tC, single (s)	
tC, 2 stage (s)	
tF (s)	
p0 queue free %	
cM capacity (veh/h)	

Direction, Lane #



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	10	10	10	10	10	10	20	20	10	40	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	10	10	10	10	10	10	20	20	10	40	10
Pedestrians		15			21			3			9	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	154	161	63	154	156	60	65			61		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	154	161	63	154	156	60	65			61		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	99	99	99	99	99			99		
cM capacity (veh/h)	759	704	992	759	708	986	1531			1528		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	30	30	50	60
Volume Left	10	10	10	10
Volume Right	10	10	20	10
cSH	801	801	1531	1528
Volume to Capacity	0.04	0.04	0.01	0.01
Queue Length 95th (ft)	3	3	0	0
Control Delay (s)	9.7	9.7	1.5	1.3
Lane LOS	A	A	A	A
Approach Delay (s)	9.7	9.7	1.5	1.3
Approach LOS	A	A		

Intersection Summary				
Average Delay	4.3			
Intersection Capacity Utilization	21.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	20	20	590	710	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	20	20	590	710	10
Pedestrians	14			3	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.75	0.75	0.75			
vC, conflicting volume	1361	732	734			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1315	478	481			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	95	98			
cM capacity (veh/h)	127	438	804			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	30	610	720
Volume Left	10	20	0
Volume Right	20	0	10
cSH	241	804	1700
Volume to Capacity	0.12	0.02	0.42
Queue Length 95th (ft)	10	2	0
Control Delay (s)	22.0	0.7	0.0
Lane LOS	C	A	
Approach Delay (s)	22.0	0.7	0.0
Approach LOS	C		

Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	58.2%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	50	20	10	20	30	1700	40	20	1850	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.98			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.90			0.95		1.00	1.00		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1639			1740		1770	5059		1787	5129	
Flt Permitted		0.96			0.88		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1589			1562		1770	5059		1787	5129	
Peak-hour factor, PHF	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. Flow (vph)	10	10	50	20	10	20	30	1700	40	20	1850	10
RTOR Reduction (vph)	0	41	0	0	16	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	29	0	0	34	0	30	1739	0	20	1860	0
Confl. Peds. (#/hr)	11		20	20		11			20			30
Confl. Bikes (#/hr)									8			20
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		15.8			15.8		4.5	58.1		3.6	57.2	
Effective Green, g (s)		15.8			15.8		4.5	58.1		3.6	57.2	
Actuated g/C Ratio		0.18			0.18		0.05	0.65		0.04	0.64	
Clearance Time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		278			274		88	3265		71	3259	
v/s Ratio Prot							0.02	c0.34		0.01	c0.36	
v/s Ratio Perm		0.02			c0.02							
v/c Ratio		0.10			0.12		0.34	0.53		0.28	0.57	
Uniform Delay, d1		31.2			31.3		41.3	8.6		41.9	9.4	
Progression Factor		1.00			1.00		1.19	0.43		0.50	0.26	
Incremental Delay, d2		0.2			0.2		1.7	0.5		1.2	0.4	
Delay (s)		31.3			31.6		51.0	4.2		22.2	2.9	
Level of Service		C			C		D	A		C	A	
Approach Delay (s)		31.3			31.6			5.0			3.1	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	4.9	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5	
Intersection Capacity Utilization	62.7%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	10	30	10	10	10	20	30	20	10	30	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	20	10	30	10	10	10	20	30	20	10	30	20
Pedestrians		33			32			3			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			3			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	191	215	76	210	215	75	83			82		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	191	215	76	210	215	75	83			82		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	98	97	98	98	99	99			99		
cM capacity (veh/h)	693	637	961	660	637	963	1485			1487		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	60	30	70	60
Volume Left	20	10	20	10
Volume Right	30	10	20	20
cSH	792	727	1485	1487
Volume to Capacity	0.08	0.04	0.01	0.01
Queue Length 95th (ft)	6	3	1	1
Control Delay (s)	9.9	10.2	2.2	1.3
Lane LOS	A	B	A	A
Approach Delay (s)	9.9	10.2	2.2	1.3
Approach LOS	A	B		

Intersection Summary				
Average Delay	5.1			
Intersection Capacity Utilization	23.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	50	100	120	90	110	210	60	110	1500	180	10	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.96			1.00	0.97		1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00			0.98	1.00		1.00	1.00			1.00
Frt	1.00	0.92			1.00	0.85		1.00	0.98			1.00
Flt Protected	0.95	1.00			0.98	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1770	1650			1786	1534		1787	5038			1787
Flt Permitted	0.54	1.00			0.64	1.00		0.95	1.00			0.95
Satd. Flow (perm)	1012	1650			1171	1534		1787	5038			1787
Peak-hour factor, PHF	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. Flow (vph)	50	100	120	90	110	210	60	110	1500	180	10	140
RTOR Reduction (vph)	0	54	0	0	0	155	0	0	14	0	0	0
Lane Group Flow (vph)	50	166	0	0	200	55	0	170	1666	0	0	150
Confl. Peds. (#/hr)	15		74	74		15				11		
Confl. Bikes (#/hr)			9			8				2		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	23.5	23.5			23.5	23.5		7.5	40.5			12.5
Effective Green, g (s)	23.5	23.5			23.5	23.5		7.5	40.5			12.5
Actuated g/C Ratio	0.26	0.26			0.26	0.26		0.08	0.45			0.14
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	264	430			305	400		148	2267			248
v/s Ratio Prot		0.10						c0.10	c0.33			0.08
v/s Ratio Perm	0.05				c0.17	0.04						
v/c Ratio	0.19	0.39			0.66	0.14		1.15	0.73			0.60
Uniform Delay, d1	25.8	27.3			29.6	25.5		41.2	20.3			36.4
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.09			0.85
Incremental Delay, d2	0.1	0.2			3.8	0.1		93.4	0.9			2.5
Delay (s)	26.0	27.5			33.5	25.5		134.7	23.0			33.6
Level of Service	C	C			C	C		F	C			C
Approach Delay (s)		27.2			29.4				33.3			
Approach LOS		C			C				C			

Intersection Summary			
HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	100.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1760	0
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5136	
Flt Permitted	1.00	
Satd. Flow (perm)	5136	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1760	0
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1760	0
Confl. Peds. (#/hr)		15
Confl. Bikes (#/hr)		15
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	45.0	
Effective Green, g (s)	45.0	
Actuated g/C Ratio	0.50	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2568	
v/s Ratio Prot	c0.34	
v/s Ratio Perm		
v/c Ratio	0.69	
Uniform Delay, d1	17.1	
Progression Factor	0.87	
Incremental Delay, d2	1.3	
Delay (s)	16.2	
Level of Service	B	
Approach Delay (s)	17.6	
Approach LOS	B	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	112	280	8	6	370	82	15	7	10	13	2	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			0.99			0.94			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			0.91	
Frt		1.00			0.97			0.96			0.94	
Flt Protected		0.99			1.00			0.98			0.98	
Satd. Flow (prot)		3454			3459			1434			1578	
Flt Permitted		0.73			0.95			0.93			0.94	
Satd. Flow (perm)		2573			3289			1371			1513	
Peak-hour factor, PHF	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. Flow (vph)	112	280	8	6	370	82	15	7	10	13	2	13
RTOR Reduction (vph)	0	3	0	0	37	0	0	5	0	0	7	0
Lane Group Flow (vph)	0	397	0	0	421	0	0	27	0	0	21	0
Confl. Peds. (#/hr)	26		83	83		26			303	303		
Confl. Bikes (#/hr)			9			8						2
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Prot	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases				6			4			8		
Actuated Green, G (s)		21.0			14.0			23.0			23.0	
Effective Green, g (s)		21.0			14.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.28			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1151			920			630			695	
v/s Ratio Prot		c0.03										
v/s Ratio Perm		0.12			c0.13			c0.02			0.01	
v/c Ratio		0.35			0.46			0.04			0.03	
Uniform Delay, d1		9.8			14.9			7.4			7.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.8			1.6			0.1			0.1	
Delay (s)		10.7			16.5			7.6			7.5	
Level of Service		B			B			A			A	
Approach Delay (s)		10.7			16.5			7.6			7.5	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.22			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	54.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	280	1	11	430	50	3	0	7	40	3	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	280	1	11	430	50	3	0	7	40	3	30
Pedestrians		30			15			18			35	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			1			1			3	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.84			0.91			0.88	0.88	0.91	0.88	0.88	0.84
vC, conflicting volume	515			299			897	896	314	874	871	520
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	325			186			596	594	202	571	567	330
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	97			99			99	100	99	88	99	95
cM capacity (veh/h)	1000			1255			302	330	728	341	353	568

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	311	491	10	73
Volume Left	30	11	3	40
Volume Right	1	50	7	30
cSH	1000	1255	511	409
Volume to Capacity	0.03	0.01	0.02	0.18
Queue Length 95th (ft)	2	1	1	16
Control Delay (s)	1.1	0.3	12.2	15.7
Lane LOS	A	A	B	C
Approach Delay (s)	1.1	0.3	12.2	15.7
Approach LOS			B	C

Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	48.6%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
13: SR-24 NB Off-Ramp & 52nd Street

Children's Hospital
2035 AM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	330	0	0	500	1270	0	1100	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	330	0	0	500	1270	0	1100	0	0
Pedestrians							36			
Lane Width (ft)							12.0			
Walking Speed (ft/s)							4.0			
Percent Blockage							3			
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.80						0.80		0.80	0.80
vC, conflicting volume	1770			366			2136	201	1765	866
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1461			366			1919	201	1455	330
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	366			1153			52	779	0	456

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	165	165	333	590	847	550	550
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	423	847	550	550
cSH	1700	1700	1700	1700	1700	779	779
Volume to Capacity	0.10	0.10	0.20	0.35	0.50	0.71	0.71
Queue Length 95th (ft)	0	0	0	0	0	149	149
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	19.9	19.9
Lane LOS						C	C
Approach Delay (s)	0.0		0.0			19.9	
Approach LOS						C	

Intersection Summary				
Average Delay	6.8			
Intersection Capacity Utilization	57.2%	ICU Level of Service		B
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
14: 52nd Street & Shattuck Ave

Children's Hospital
2035 AM No Project

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	50	300	920	160	50	1130	150	180	150	60	140	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.99		1.00	0.99		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.98		1.00	0.98		1.00	0.96			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.98
Satd. Flow (prot)		1787	4960		1805	5069		1752	1748			1731
Flt Permitted		0.95	1.00		0.95	1.00		0.31	1.00			0.77
Satd. Flow (perm)		1787	4960		1805	5069		578	1748			1356
Peak-hour factor, PHF	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. Flow (vph)	50	300	920	160	50	1130	150	180	150	60	140	190
RTOR Reduction (vph)	0	0	23	0	0	18	0	0	16	0	0	0
Lane Group Flow (vph)	0	350	1057	0	50	1262	0	180	194	0	0	330
Confl. Peds. (#/hr)				18			8			15	15	
Confl. Bikes (#/hr)				18			2			15		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		21.5	34.6		5.5	18.6		35.9	35.9			25.4
Effective Green, g (s)		21.5	34.6		5.5	18.6		35.9	35.9			25.4
Actuated g/C Ratio		0.24	0.38		0.06	0.21		0.40	0.40			0.28
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		426	1906		110	1047		315	697			382
v/s Ratio Prot		c0.20	0.21		0.03	c0.25		c0.04	0.11			
v/s Ratio Perm								0.19				c0.24
v/c Ratio		0.82	0.55		0.45	1.21		0.57	0.28			0.86
Uniform Delay, d1		32.4	21.7		40.8	35.7		19.3	18.3			30.7
Progression Factor		1.00	1.00		1.05	0.88		1.00	1.00			1.00
Incremental Delay, d2		16.2	1.2		1.9	98.4		2.5	1.0			22.0
Delay (s)		48.6	22.8		44.7	129.9		21.8	19.3			52.7
Level of Service		D	C		D	F		C	B			D
Approach Delay (s)			29.1			126.7			20.4			38.6
Approach LOS			C			F			C			D

Intersection Summary				
HCM 2000 Control Delay	63.4	HCM 2000 Level of Service		E
HCM 2000 Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		18.0
Intersection Capacity Utilization	111.1%	ICU Level of Service		H
Analysis Period (min)	15			

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	410
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.92
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1385
Flt Permitted	1.00
Satd. Flow (perm)	1385
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	410
RTOR Reduction (vph)	292
Lane Group Flow (vph)	118
Confl. Peds. (#/hr)	24
Confl. Bikes (#/hr)	62
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	25.4
Effective Green, g (s)	25.4
Actuated g/C Ratio	0.28
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	390
v/s Ratio Prot	
v/s Ratio Perm	0.09
v/c Ratio	0.30
Uniform Delay, d1	25.3
Progression Factor	1.00
Incremental Delay, d2	2.0
Delay (s)	27.3
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

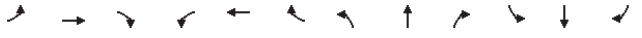
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	10	120	70	230	10	1010	140	130	900	480
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.98			0.99		1.00	0.96	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.95		1.00	0.89			0.98		1.00	0.95	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1641		1698	1560			3863		1770	3210	
Flt Permitted		0.98		0.95	1.00			0.94		0.95	1.00	
Satd. Flow (perm)		1641		1698	1560			3627		1770	3210	
Peak-hour factor, PHF	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. Flow (vph)	10	10	10	120	70	230	10	1010	140	130	900	480
RTOR Reduction (vph)	0	10	0	0	129	0	0	9	0	0	57	0
Lane Group Flow (vph)	0	21	0	108	183	0	0	1151	0	130	1323	0
Confl. Peds. (#/hr)	6					6	33		27			33
Confl. Bikes (#/hr)			2			3			50			41
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		4.5		17.1	17.1			40.6		9.8	54.9	
Effective Green, g (s)		4.5		17.1	17.1			40.6		9.8	54.9	
Actuated g/C Ratio		0.05		0.19	0.19			0.45		0.11	0.61	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		82		322	296			1636		192	1958	
v/s Ratio Prot		c0.01		0.06	c0.12					0.07	c0.41	
v/s Ratio Perm								0.32				
v/c Ratio		0.25		0.34	0.62			0.70		0.68	0.68	
Uniform Delay, d1		41.1		31.5	33.5			19.9		38.6	11.6	
Progression Factor		1.49		1.00	1.00			0.94		1.00	1.00	
Incremental Delay, d2		0.8		0.6	3.8			1.8		9.1	1.9	
Delay (s)		62.2		32.2	37.3			20.5		47.7	13.5	
Level of Service		E		C	D			C		D	B	
Approach Delay (s)		62.2			36.0			20.5			16.5	
Approach LOS		E			D			C			B	

Intersection Summary					
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C		
HCM 2000 Volume to Capacity ratio	0.68				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0		
Intersection Capacity Utilization	101.4%	ICU Level of Service	G		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	330	660	100	130	590	320	130	510	80	220	740	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.97		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3399		1787	3292		1719	3324		1752	3420	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3399		1787	3292		1719	3324		1752	3420	
Peak-hour factor, PHF	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. Flow (vph)	330	660	100	130	590	320	130	510	80	220	740	70
RTOR Reduction (vph)	0	13	0	0	80	0	0	13	0	0	8	0
Lane Group Flow (vph)	330	747	0	130	830	0	130	577	0	220	802	0
Confl. Peds. (#/hr)			47			47			45			56
Confl. Bikes (#/hr)			14			11			41			41
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	12.9	27.3		10.6	25.5		10.7	23.6		12.0	25.9	
Effective Green, g (s)	12.9	27.3		10.6	25.5		10.7	23.6		12.0	25.9	
Actuated g/C Ratio	0.14	0.30		0.12	0.28		0.12	0.26		0.13	0.29	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	487	1031		210	932		204	871		233	984	
v/s Ratio Prot	c0.10	0.22		0.07	c0.25		0.08	0.17		c0.13	c0.23	
v/s Ratio Perm												
v/c Ratio	0.68	0.72		0.62	0.89		0.64	0.66		0.94	0.82	
Uniform Delay, d1	36.6	28.0		37.8	30.9		37.8	29.6		38.7	29.8	
Progression Factor	1.22	1.02		1.00	1.00		1.00	1.00		1.24	0.83	
Incremental Delay, d2	3.1	3.7		5.3	12.5		6.4	3.9		37.5	6.0	
Delay (s)	47.8	32.3		43.1	43.4		44.2	33.6		85.5	30.8	
Level of Service	D	C		D	D		D	C		F	C	
Approach Delay (s)		37.0			43.4			35.5			42.5	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	39.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	81.6%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	260	0	0	0	0	1610	0	0	0	0	1720	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	260	0	0	0	0	1610	0	0	0	0	1720	260
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	260	0	0	0	0	1610	0	0	0	0	1720	260
Confl. Peds. (#/hr)				9								
Confl. Bikes (#/hr)									3			
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	8.0					45.0					29.0	45.0
Effective Green, g (s)	8.0					45.0					29.0	45.0
Actuated g/C Ratio	0.18					1.00					0.64	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	581					1627					2303	2814
v/s Ratio Prot	0.08										0.48	0.09
v/s Ratio Perm						c0.99						
v/c Ratio	0.45					0.99					0.75	0.09
Uniform Delay, d1	16.5					0.0					5.5	0.0
Progression Factor	1.00					1.00					2.06	1.00
Incremental Delay, d2	2.5					20.0					1.7	0.0
Delay (s)	19.0					20.0					13.0	0.0
Level of Service	B					B					B	A
Approach Delay (s)		19.0			20.0			0.0			11.3	
Approach LOS		B			B			A			B	

Intersection Summary				
HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	1.20			
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	61.6%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	190	20	80	130	0	40	0	80	10	60	10
Peak Hour 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
Hourly flow rate (vph)	0	190	20	80	130	0	40	0	80	10	60	10

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	210	210	40	80	80
Volume Left (vph)	0	80	40	0	10
Volume Right (vph)	20	0	0	80	10
Hadj (s)	-0.04	0.11	0.50	-0.70	-0.02
Departure Headway (s)	4.6	4.8	6.1	4.9	5.2
Degree Utilization, x	0.27	0.28	0.07	0.11	0.12
Capacity (veh/h)	730	712	545	669	628
Control Delay (s)	9.4	9.6	8.4	7.3	8.9
Approach Delay (s)	9.4	9.6	7.7		8.9
Approach LOS	A	A	A		A

Intersection Summary					
Delay			9.1		
Level of Service			A		
Intersection Capacity Utilization			44.7%	ICU Level of Service	A
Analysis Period (min)			15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	20	170	10	10	140	30	10	0	10	30	10	10
Peak Hour 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
Hourly flow rate (vph)	20	170	10	10	140	30	10	0	10	30	10	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	200	180	20	50
Volume Left (vph)	20	10	10	30
Volume Right (vph)	10	30	10	10
Hadj (s)	0.01	-0.09	-0.20	0.00
Departure Headway (s)	4.3	4.2	4.6	4.8
Degree Utilization, x	0.24	0.21	0.03	0.07
Capacity (veh/h)	824	828	714	692
Control Delay (s)	8.6	8.3	7.7	8.1
Approach Delay (s)	8.6	8.3	7.7	8.1
Approach LOS	A	A	A	A

Intersection Summary					
Delay			8.4		
Level of Service			A		
Intersection Capacity Utilization			28.6%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis — Children's Hospital
20: Genoa Street & 55th Street — 2035 AM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	400	10	10	440	20	10	20	20	40	20	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	400	10	10	440	20	10	20	20	40	20	10
Pedestrians		12			3			15			17	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	477			425			942	937	423	945	932	479
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	477			425			942	937	423	945	932	479
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			95	92	97	81	92	98
cM capacity (veh/h)	1075			1131			214	255	626	209	255	573

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	420	470	50	70
Volume Left	10	10	10	40
Volume Right	10	20	20	10
cSH	1075	1131	318	244
Volume to Capacity	0.01	0.01	0.16	0.29
Queue Length 95th (ft)	1	1	14	29
Control Delay (s)	0.3	0.3	18.4	25.6
Lane LOS	A	A	C	D
Approach Delay (s)	0.3	0.3	18.4	25.6
Approach LOS			C	D

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	46.5%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis — Children's Hospital
1: MLK Way & 55th Street — 2035 PM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	20	270	180	60	240	110	20	210	1770	110	200	1470
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			0.99			1.00	0.99		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.95			0.96			1.00	0.99		1.00	1.00
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1747			1728			1770	5010		1770	5054
Flt Permitted		0.97			0.75			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1707			1310			1770	5010		1770	5054
Peak-hour factor, PHF	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. Flow (vph)	20	270	180	60	240	110	20	210	1770	110	200	1470
RTOR Reduction (vph)	0	23	0	0	14	0	0	0	6	0	0	3
Lane Group Flow (vph)	0	447	0	0	396	0	0	230	1874	0	200	1507
Confl. Peds. (#/hr)	17		23	23		17				30		
Confl. Bikes (#/hr)			24			18				23		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		31.7			31.7			21.5	42.3		11.5	32.3
Effective Green, g (s)		31.7			31.7			21.5	42.3		11.5	32.3
Actuated g/C Ratio		0.32			0.32			0.22	0.42		0.12	0.32
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		541			415			380	2119		203	1632
v/s Ratio Prot								0.13	c0.37		0.11	c0.30
v/s Ratio Perm		0.26			c0.30							
v/c Ratio		0.83			0.96			0.61	0.88		0.99	0.92
Uniform Delay, d1		31.6			33.5			35.4	26.6		44.2	32.7
Progression Factor		1.00			1.00			0.51	0.37		1.00	1.00
Incremental Delay, d2		10.0			32.5			2.2	4.8		58.5	10.3
Delay (s)		41.6			66.0			20.2	14.6		102.6	42.9
Level of Service		D			E			C	B		F	D
Approach Delay (s)		41.6			66.0				15.2			49.9
Approach LOS		D			E				B			D

Intersection Summary					
HCM 2000 Control Delay	34.9	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.95				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		14.5	
Intersection Capacity Utilization	104.8%	ICU Level of Service		G	
Analysis Period (min)	15				

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	40
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	40
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	18
Confl. Bikes (#/hr)	23
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	530	20	10	330	20	20	20	30	20	20	40
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	530	20	10	330	20	20	20	30	20	20	40
Pedestrians		6			20			11			26	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked	0.96						0.96	0.96		0.96	0.96	0.96
vC, conflicting volume	376			561			1027	1007	571	1046	1007	372
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	328			561			1007	986	571	1027	986	324
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			99			89	91	94	88	91	94
cM capacity (veh/h)	1140			991			174	224	511	163	221	667

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	580	360	70	80
Volume Left	30	10	20	20
Volume Right	20	20	30	40
cSH	1140	991	266	293
Volume to Capacity	0.03	0.01	0.26	0.27
Queue Length 95th (ft)	2	1	26	27
Control Delay (s)	0.7	0.3	23.3	21.8
Lane LOS	A	A	C	C
Approach Delay (s)	0.7	0.3	23.3	21.8
Approach LOS			C	C

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	59.4%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
2035 PM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	390	70	30	210	50	80	630	50	30	580	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.99			0.99			1.00			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.99			0.99	
Flt Protected		0.99			0.99			0.99			1.00	
Satd. Flow (prot)		1744			1773			1827			1843	
Flt Permitted		0.85			0.92			0.88			0.95	
Satd. Flow (perm)		1495			1641			1613			1757	
Peak-hour factor, PHF	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. Flow (vph)	110	390	70	30	210	50	80	630	50	30	580	60
RTOR Reduction (vph)	0	6	0	0	10	0	0	3	0	0	5	0
Lane Group Flow (vph)	0	564	0	0	280	0	0	757	0	0	665	0
Confl. Peds. (#/hr)	17		17	17		17	29		11	11		29
Confl. Bikes (#/hr)			23			15			47			33
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		29.0			29.0			43.0			43.0	
Effective Green, g (s)		29.0			29.0			43.0			43.0	
Actuated g/C Ratio		0.36			0.36			0.54			0.54	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		541			594			866			944	
v/s Ratio Prot												
v/s Ratio Perm		c0.38			0.17			c0.47			0.38	
v/c Ratio		1.04			0.47			0.87			0.70	
Uniform Delay, d1		25.5			19.6			16.1			13.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		50.0			2.7			11.9			4.4	
Delay (s)		75.5			22.3			28.0			18.2	
Level of Service		E			C			C			B	
Approach Delay (s)		75.5			22.3			28.0			18.2	
Approach LOS		E			C			C			B	

Intersection Summary				
HCM 2000 Control Delay	36.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.94			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	126.2%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
2035 PM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	260	30	170	50	20	20	130	1240	70	20	1130	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.98			0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Frt		0.95			0.97		1.00	0.99		1.00	0.99	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1617			1694		1770	3490		1787	3470	
Flt Permitted		0.79			0.72		0.13	1.00		0.12	1.00	
Satd. Flow (perm)		1315			1255		248	3490		220	3470	
Peak-hour factor, PHF	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. Flow (vph)	260	30	170	50	20	20	130	1240	70	20	1130	120
RTOR Reduction (vph)	0	25	0	0	12	0	0	4	0	0	8	0
Lane Group Flow (vph)	0	435	0	0	78	0	130	1306	0	20	1242	0
Confl. Peds. (#/hr)	17		39	39		17	38		26	26		38
Confl. Bikes (#/hr)			12			14			44			68
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		32.7			32.7		48.3	48.3		48.3	48.3	
Effective Green, g (s)		32.7			32.7		48.3	48.3		48.3	48.3	
Actuated g/C Ratio		0.36			0.36		0.54	0.54		0.54	0.54	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		477			455		133	1872		118	1862	
v/s Ratio Prot								0.37			0.36	
v/s Ratio Perm		c0.33			0.06		c0.52			0.09		
v/c Ratio		0.91			0.17		0.98	0.70		0.17	0.67	
Uniform Delay, d1		27.3			19.5		20.3	15.4		10.6	15.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		21.7			0.2		72.2	2.2		3.1	1.9	
Delay (s)		49.0			19.6		92.6	17.6		13.7	17.0	
Level of Service		D			B		F	B		B	B	
Approach Delay (s)		49.0			19.6			24.4			16.9	
Approach LOS		D			B			C			B	

Intersection Summary				
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.95			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	87.5%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (veh/h)	10	10	50	20	10	10	10	40	2060	20	10	20
Sign Control		Stop			Stop				Free			
Grade		0%			0%				0%			
Peak Hour 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
Hourly flow rate (vph)	10	10	50	20	10	10	0	40	2060	20	0	20
Pedestrians		8			29				17			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		1			2				1			
Right turn flare (veh)												
Median type									None			
Median storage veh)												
Upstream signal (ft)									299			
pX, platoon unblocked	0.85	0.85	0.72	0.85	0.85	0.74	0.00	0.72			0.00	0.74
vC, conflicting volume	2500	3907	588	2844	3907	726	0	1688			0	2109
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	35	1696	0	442	1696	0	0	568			0	1251
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			0.0	4.1
tC, 2 stage (s)												
tF (s)	*7.0	*7.0	*7.0	*6.5	*6.5	*6.5	0.0	2.2			0.0	2.2
p0 queue free %	97	84	86	89	84	97	0	94			0	95
cM capacity (veh/h)	320	61	360	177	61	398	0	710			0	400

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	70	40	555	1030	535	435	830	435
Volume Left	10	20	40	0	0	20	0	0
Volume Right	50	10	0	0	20	0	0	20
cSH	209	133	710	1700	1700	400	1700	1700
Volume to Capacity	0.33	0.30	0.06	0.61	0.31	0.05	0.49	0.26
Queue Length 95th (ft)	35	29	4	0	0	4	0	0
Control Delay (s)	30.6	43.4	1.5	0.0	0.0	1.6	0.0	0.0
Lane LOS	D	E	A			A		
Approach Delay (s)	30.6	43.4	0.4			0.4		
Approach LOS	D	E						

Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	91.6%	ICU Level of Service	F	
Analysis Period (min)	15			

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
5: MLK Way & 54th Street

Children's Hospital
2035 PM No Project

Movement	SBT	SBR
Lane Configurations		
Volume (veh/h)	1660	20
Sign Control	Free	
Grade	0%	
Peak Hour Factor	1.00	1.00
Hourly flow rate (vph)	1660	20
Pedestrians		
Lane Width (ft)		
Walking Speed (ft/s)		
Percent Blockage		
Right turn flare (veh)		
Median type	None	
Median storage veh)		
Upstream signal (ft)	294	
pX, platoon unblocked		
vC, conflicting volume		
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol		
tC, single (s)		
tC, 2 stage (s)		
tF (s)		
p0 queue free %		
cM capacity (veh/h)		

Direction, Lane #

HCM Unsignalized Intersection Capacity Analysis
6: Dover Street & 54th Street

Children's Hospital
2035 PM No Project

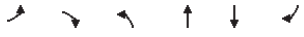
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	20	10	10	10	20	10	50	10	10	30	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	20	10	10	10	20	10	50	10	10	30	10
Pedestrians		18			12			9			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	178	165	62	171	165	72	58			72		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	178	165	62	171	165	72	58			72		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	97	99	99	99	98	99			99		
cM capacity (veh/h)	728	704	986	737	704	982	1536			1526		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	40	40	70	50
Volume Left	10	10	10	10
Volume Right	10	20	10	10
cSH	765	831	1536	1526
Volume to Capacity	0.05	0.05	0.01	0.01
Queue Length 95th (ft)	4	4	0	0
Control Delay (s)	10.0	9.6	1.1	1.5
Lane LOS	A	A	A	A
Approach Delay (s)	10.0	9.6	1.1	1.5
Approach LOS	A	A		

Intersection Summary				
Average Delay	4.7			
Intersection Capacity Utilization	21.1%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
7: Shattuck Ave & 54th Street

Children's Hospital
2035 PM No Project



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	20	20	770	700	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	20	20	770	700	10
Pedestrians	38				2	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	3				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.81	0.74	0.74			
vC, conflicting volume	1555	743	748			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1168	476	482			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	95	97			
cM capacity (veh/h)	165	425	773			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	30	790	710
Volume Left	10	20	0
Volume Right	20	0	10
cSH	278	773	1700
Volume to Capacity	0.11	0.03	0.42
Queue Length 95th (ft)	9	2	0
Control Delay (s)	19.5	0.7	0.0
Lane LOS	C	A	
Approach Delay (s)	19.5	0.7	0.0
Approach LOS	C		

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	66.6%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	10	10	60	40	10	10	10	10	2110	30	30	1720
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.90			0.98			1.00	1.00		1.00	1.00
Flt Protected		0.99			0.97			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1632			1785			1770	5063		1787	5128
Flt Permitted		0.97			0.82			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1585			1510			1770	5063		1787	5128
Peak-hour factor, PHF	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. Flow (vph)	10	10	60	40	10	10	10	10	2110	30	30	1720
RTOR Reduction (vph)	0	50	0	0	8	0	0	0	1	0	0	0
Lane Group Flow (vph)	0	30	0	0	52	0	0	20	2139	0	30	1730
Confl. Peds. (#/hr)	12		6	6		12				48		
Confl. Bikes (#/hr)			6			3				20		
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		16.4			16.4			3.1	64.7		6.4	68.0
Effective Green, g (s)		16.4			16.4			3.1	64.7		6.4	68.0
Actuated g/C Ratio		0.16			0.16			0.03	0.65		0.06	0.68
Clearance Time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		259			247			54	3275		114	3487
v/s Ratio Prot								0.01	c0.42		0.02	c0.34
v/s Ratio Perm		0.02			c0.03							
v/c Ratio		0.12			0.21			0.37	0.65		0.26	0.50
Uniform Delay, d1		35.6			36.2			47.5	10.8		44.6	7.7
Progression Factor		1.00			1.05			1.45	0.14		0.76	0.50
Incremental Delay, d2		0.2			0.4			2.3	0.6		0.6	0.3
Delay (s)		35.8			38.2			71.2	2.0		34.3	4.1
Level of Service		D			D			E	A		C	A
Approach Delay (s)		35.8			38.2				2.7			4.6
Approach LOS		D			D				A			A

Intersection Summary			
HCM 2000 Control Delay	4.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: MLK Way & 53rd Street

Children's Hospital
2035 PM No Project

Movement	SBR
Lane Configurations	
Volume (vph)	10
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	10
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	21
Confl. Bikes (#/hr)	24
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis — Children's Hospital
9: Dover Street & 53rd Street — 2035 PM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	10	30	10	10	10	10	50	10	10	30	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	20	10	30	10	10	10	10	50	10	10	30	10
Pedestrians		38			15			6			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	189	188	79	186	188	76	78			75		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	189	188	79	186	188	76	78			75		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	99	97	99	99	99	99			99		
cM capacity (veh/h)	700	670	951	701	670	974	1485			1518		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	60	30	70	50
Volume Left	20	10	10	10
Volume Right	30	10	10	10
cSH	799	760	1485	1518
Volume to Capacity	0.08	0.04	0.01	0.01
Queue Length 95th (ft)	6	3	1	0
Control Delay (s)	9.9	9.9	1.1	1.5
Lane LOS	A	A	A	A
Approach Delay (s)	9.9	9.9	1.1	1.5
Approach LOS	A	A		

Intersection Summary				
Average Delay		5.0		
Intersection Capacity Utilization		24.0%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis — Children's Hospital
10: MLK Way & 52nd Street — 2035 PM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	80	140	110	140	100	210	60	120	1840	100	160	1660
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5		4.0	4.5
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91		1.00	0.91
Frpb, ped/bikes	1.00	0.95			1.00	0.96		1.00	1.00		1.00	1.00
Flpb, ped/bikes	0.99	1.00			0.97	1.00		1.00	1.00		1.00	1.00
Frt	1.00	0.93			1.00	0.85		1.00	0.99		1.00	1.00
Flt Protected	0.95	1.00			0.97	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1760	1673			1751	1521		1787	5084		1787	5128
Flt Permitted	0.47	1.00			0.52	1.00		0.95	1.00		0.95	1.00
Satd. Flow (perm)	872	1673			928	1521		1787	5084		1787	5128
Peak-hour factor, PHF	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. Flow (vph)	80	140	110	140	100	210	60	120	1840	100	160	1660
RTOR Reduction (vph)	0	30	0	0	0	153	0	0	6	0	0	1
Lane Group Flow (vph)	80	220	0	0	240	57	0	180	1934	0	160	1669
Confl. Peds. (#/hr)	24		92	92		24				15		
Confl. Bikes (#/hr)			14			6				23		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8		8						
Actuated Green, G (s)	27.2	27.2			27.2	27.2		13.6	41.8		17.5	45.2
Effective Green, g (s)	27.2	27.2			27.2	27.2		13.6	41.8		17.5	45.2
Actuated g/C Ratio	0.27	0.27			0.27	0.27		0.14	0.42		0.18	0.45
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5		4.0	4.5
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	237	455			252	413		243	2125		312	2317
v/s Ratio Prot		0.13						0.10	c0.38		0.09	c0.33
v/s Ratio Perm	0.09				c0.26	0.04						
v/c Ratio	0.34	0.48			0.95	0.14		0.74	0.91		0.51	0.72
Uniform Delay, d1	29.2	30.5			35.8	27.5		41.5	27.3		37.4	22.3
Progression Factor	1.00	1.00			0.91	1.81		0.97	1.06		0.51	0.27
Incremental Delay, d2	0.3	0.3			42.1	0.1		3.0	2.3		0.5	1.8
Delay (s)	29.5	30.8			74.5	49.9		43.2	31.3		19.6	7.7
Level of Service	C	C			E	D		D	C		B	A
Approach Delay (s)		30.5			63.0				32.3			8.8
Approach LOS		C			E				C			A

Intersection Summary				
HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	107.6%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	10
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	10
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	20
Confl. Bikes (#/hr)	26
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	370	5	11	340	17	25	3	13	63	4	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.93			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			0.91	
Frt		1.00			0.99			0.96			0.93	
Flt Protected		1.00			1.00			0.97			0.98	
Satd. Flow (prot)		3516			3554			1419			1567	
Flt Permitted		0.94			0.94			0.87			0.89	
Satd. Flow (perm)		3327			3354			1273			1424	
Peak-hour factor, PHF	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. Flow (vph)	17	370	5	11	340	17	25	3	13	63	4	73
RTOR Reduction (vph)	0	2	0	0	7	0	0	7	0	0	39	0
Lane Group Flow (vph)	0	390	0	0	361	0	0	34	0	0	101	0
Confl. Peds. (#/hr)			89	89		38			312	312		
Confl. Bikes (#/hr)			15			9						2
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Prot	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases				6			4			8		
Actuated Green, G (s)		21.0			14.0			23.0			23.0	
Effective Green, g (s)		21.0			14.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.28			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1412			939			585			655	
v/s Ratio Prot		c0.02										
v/s Ratio Perm		0.09			c0.11			0.03			c0.07	
v/c Ratio		0.28			0.38			0.06			0.15	
Uniform Delay, d1		9.5			14.5			7.5			7.8	
Progression Factor		1.60			1.00			1.00			1.00	
Incremental Delay, d2		0.4			1.2			0.2			0.5	
Delay (s)		15.6			15.7			7.7			8.3	
Level of Service		B			B			A			A	
Approach Delay (s)		15.6			15.7			7.7			8.3	
Approach LOS		B			B			A			A	

Intersection Summary					
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.25				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		9.0	
Intersection Capacity Utilization	48.8%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
12: 52nd Street & Dover Street

Children's Hospital
2035 PM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	420	7	5	360	40	5	2	8	50	1	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	420	7	5	360	40	5	2	8	50	1	20
Pedestrians		56			11			53			23	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		5			1			4			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.88			0.88			0.93	0.93	0.88	0.93	0.93	0.88
vC, conflicting volume	423			480			1003	970	488	916	953	459
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	270			345			686	650	353	594	633	311
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	97			100			98	99	99	86	100	97
cM capacity (veh/h)	1106			1029			268	320	563	348	339	601

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	457	405	15	71
Volume Left	30	5	5	50
Volume Right	7	40	8	20
cSH	1106	1029	383	394
Volume to Capacity	0.03	0.00	0.04	0.18
Queue Length 95th (ft)	2	0	3	16
Control Delay (s)	0.8	0.2	14.8	16.1
Lane LOS	A	A	B	C
Approach Delay (s)	0.8	0.2	14.8	16.1
Approach LOS			B	C

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	60.3%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
13: SR-24 NB Off-Ramp & 52nd Street

Children's Hospital
2035 PM No Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	480	0	0	410	1150	0	1140	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	480	0	0	410	1150	0	1140	0	0
Pedestrians							50			
Lane Width (ft)							12.0			
Walking Speed (ft/s)							4.0			
Percent Blockage							4			
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.79						0.79		0.79	0.79
vC, conflicting volume	1560			530			2090	290	1790	940
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1174			530			1846	290	1465	388
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	466			990			56	674	0	412

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	240	240	273	520	767	570	570
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	383	767	570	570
cSH	1700	1700	1700	1700	1700	674	674
Volume to Capacity	0.14	0.14	0.16	0.31	0.45	0.85	0.85
Queue Length 95th (ft)	0	0	0	0	0	237	237
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	32.5	32.5
Lane LOS						D	D
Approach Delay (s)	0.0		0.0			32.5	
Approach LOS						D	

Intersection Summary				
Average Delay	11.6			
Intersection Capacity Utilization	59.9%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	50	350	1020	200	90	960	180	170	290	100	170	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.98		1.00	0.99		1.00	0.98			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			0.99
Frt		1.00	0.98		1.00	0.98		1.00	0.96			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.98
Satd. Flow (prot)		1787	4926		1805	4991		1752	1737			1714
Flt Permitted		0.95	1.00		0.95	1.00		0.24	1.00			0.52
Satd. Flow (perm)		1787	4926		1805	4991		436	1737			921
Peak-hour factor, PHF	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. Flow (vph)	50	350	1020	200	90	960	180	170	290	100	170	170
RTOR Reduction (vph)	0	0	26	0	0	24	0	0	11	0	0	0
Lane Group Flow (vph)	0	400	1194	0	90	1116	0	170	379	0	0	340
Confl. Peds. (#/hr)				21	21		17			33	33	
Confl. Bikes (#/hr)				20			12			45		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		33.5	53.0		6.5	26.0		36.5	36.5			27.0
Effective Green, g (s)		33.5	53.0		6.5	26.0		36.5	36.5			27.0
Actuated g/C Ratio		0.30	0.48		0.06	0.24		0.33	0.33			0.25
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		544	2373		106	1179		210	576			226
v/s Ratio Prot		c0.22	0.24		0.05	c0.22		c0.04	0.22			
v/s Ratio Perm								0.23				c0.37
v/c Ratio		0.74	0.50		0.85	0.95		0.81	0.66			1.50
Uniform Delay, d1		34.3	19.5		51.3	41.3		33.5	31.4			41.5
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Incremental Delay, d2		8.6	0.8		43.4	16.1		20.1	5.8			248.7
Delay (s)		42.9	20.3		94.6	57.4		53.5	37.2			290.2
Level of Service		D	C		F	E		D	D			F
Approach Delay (s)			25.8			60.2			42.1			155.8
Approach LOS			C			E			D			F

Intersection Summary			
HCM 2000 Control Delay	60.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	109.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	380
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.92
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1389
Flt Permitted	1.00
Satd. Flow (perm)	1389
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	380
RTOR Reduction (vph)	287
Lane Group Flow (vph)	93
Confl. Peds. (#/hr)	27
Confl. Bikes (#/hr)	41
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	27.0
Effective Green, g (s)	27.0
Actuated g/C Ratio	0.25
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	340
v/s Ratio Prot	
v/s Ratio Perm	0.07
v/c Ratio	0.27
Uniform Delay, d1	33.6
Progression Factor	1.00
Incremental Delay, d2	2.0
Delay (s)	35.6
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	20	20	210	90	200	30	1220	340	200	830	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.94			0.98		1.00	0.91	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.95		1.00	0.90			0.97		1.00	0.96	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1642		1698	1508			3762		1770	3074	
Flt Permitted		0.98		0.95	1.00			0.91		0.95	1.00	
Satd. Flow (perm)		1642		1698	1508			3412		1770	3074	
Peak-hour factor, PHF	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. Flow (vph)	20	20	20	210	90	200	30	1220	340	200	830	320
RTOR Reduction (vph)	0	19	0	0	68	0	0	22	0	0	36	0
Lane Group Flow (vph)	0	41	0	189	243	0	0	1568	0	200	1114	0
Confl. Peds. (#/hr)	51					51	105		33			105
Confl. Bikes (#/hr)			2			15			53			72
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		6.2		19.6	19.6			43.0		13.2	60.7	
Effective Green, g (s)		6.2		19.6	19.6			43.0		13.2	60.7	
Actuated g/C Ratio		0.06		0.20	0.20			0.43		0.13	0.61	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		101		332	295			1467		233	1865	
v/s Ratio Prot		c0.03		0.11	c0.16					c0.11	0.36	
v/s Ratio Perm								c0.46				
v/c Ratio		0.41		0.57	0.83			1.07		0.86	0.60	
Uniform Delay, d1		45.1		36.4	38.6			28.5		42.5	12.1	
Progression Factor		1.80		1.00	1.00			0.50		1.00	1.00	
Incremental Delay, d2		0.7		2.2	16.9			35.9		25.4	1.4	
Delay (s)		81.8		38.6	55.5			50.1		67.9	13.5	
Level of Service		F		D	E			D		E	B	
Approach Delay (s)		81.8			49.1			50.1			21.6	
Approach LOS		F			D			D			C	

Intersection Summary				
HCM 2000 Control Delay	39.5	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	114.5%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	370	750	110	80	580	240	120	980	190	310	680	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.97		1.00	0.97		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.96		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3381		1787	3307		1719	3270		1752	3362	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3381		1787	3307		1719	3270		1752	3362	
Peak-hour factor, PHF	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. Flow (vph)	370	750	110	80	580	240	120	980	190	310	680	70
RTOR Reduction (vph)	0	11	0	0	44	0	0	16	0	0	8	0
Lane Group Flow (vph)	370	849	0	80	776	0	120	1154	0	310	742	0
Confl. Peds. (#/hr)			78			57			86			138
Confl. Bikes (#/hr)			12			23			51			81
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.2	29.7		8.3	23.3		7.8	32.5		13.0	38.7	
Effective Green, g (s)	15.2	29.7		8.3	23.3		7.8	32.5		13.0	38.7	
Actuated g/C Ratio	0.15	0.30		0.08	0.23		0.08	0.32		0.13	0.39	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	516	1004		148	770		134	1062		227	1301	
v/s Ratio Prot	c0.11	0.25		0.04	c0.23		0.07	c0.35		c0.18	0.22	
v/s Ratio Perm												
v/c Ratio	0.72	0.85		0.54	1.01		0.90	1.09		1.37	0.57	
Uniform Delay, d1	40.4	33.0		44.0	38.4		45.7	33.8		43.5	24.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.15	0.71	
Incremental Delay, d2	4.7	8.7		4.0	34.2		47.3	54.4		186.0	1.5	
Delay (s)	45.1	41.7		48.0	72.6		93.0	88.2		236.1	18.7	
Level of Service	D	D		D	E		F	F		F	B	
Approach Delay (s)		42.7			70.4			88.6			82.3	
Approach LOS		D			E			F			F	

Intersection Summary				
HCM 2000 Control Delay	70.8	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.05			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	100.5%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	340	0	0	0	0	1780	0	0	0	0	1750	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	340	0	0	0	0	1780	0	0	0	0	1750	250
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	340	0	0	0	0	1780	0	0	0	0	1750	250
Confl. Peds. (#/hr)				3								
Confl. Bikes (#/hr)									14			
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	13.0					50.0					29.0	50.0
Effective Green, g (s)	13.0					50.0					29.0	50.0
Actuated g/C Ratio	0.26					1.00					0.58	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	850					1627					2072	2814
v/s Ratio Prot	0.10										0.49	0.09
v/s Ratio Perm						c1.09						
v/c Ratio	0.40					1.09					0.84	0.09
Uniform Delay, d1	15.3					25.0					8.6	0.0
Progression Factor	1.00					1.00					2.69	1.00
Incremental Delay, d2	1.4					52.7					3.2	0.0
Delay (s)	16.7					77.7					26.5	0.0
Level of Service	B					E					C	A
Approach Delay (s)		16.7			77.7			0.0			23.2	
Approach LOS		B			E			A			C	

Intersection Summary				
HCM 2000 Control Delay	46.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.30			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	64.7%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	160	10	100	140	0	60	0	150	10	70	10
Peak Hour 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
Hourly flow rate (vph)	0	160	10	100	140	0	60	0	150	10	70	10

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	170	240	60	150	90
Volume Left (vph)	0	100	60	0	10
Volume Right (vph)	10	0	0	150	10
Hadj (s)	-0.02	0.12	0.50	-0.70	-0.01
Departure Headway (s)	5.0	5.0	6.2	5.0	5.4
Degree Utilization, x	0.24	0.33	0.10	0.21	0.13
Capacity (veh/h)	667	675	546	670	606
Control Delay (s)	9.5	10.5	8.7	8.1	9.2
Approach Delay (s)	9.5	10.5	8.2		9.2
Approach LOS	A	B	A		A

Intersection Summary				
Delay	9.4			
Level of Service	A			
Intersection Capacity Utilization	46.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	150	10	20	130	50	10	0	10	20	10	10
Peak Hour 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
Hourly flow rate (vph)	10	150	10	20	130	50	10	0	10	20	10	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	170	200	20	40
Volume Left (vph)	10	20	10	20
Volume Right (vph)	10	50	10	10
Hadj (s)	-0.01	-0.13	-0.20	-0.05
Departure Headway (s)	4.2	4.1	4.5	4.7
Degree Utilization, x	0.20	0.23	0.03	0.05
Capacity (veh/h)	829	861	723	704
Control Delay (s)	8.3	8.3	7.7	7.9
Approach Delay (s)	8.3	8.3	7.7	7.9
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.2	
Level of Service			A	
Intersection Capacity Utilization			28.2%	ICU Level of Service
Analysis Period (min)			15	
				A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	390	10	20	450	40	10	20	40	40	10	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	20	390	10	20	450	40	10	20	40	40	10	20
Pedestrians		8						11			5	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		1						1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	495			411			989	981	406	1000	966	483
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	495			411			989	981	406	1000	966	483
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			95	92	94	79	96	97
cM capacity (veh/h)	1069			1148			202	239	643	187	242	577

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	420	510	70	70
Volume Left	20	20	10	40
Volume Right	10	40	40	20
cSH	1069	1148	358	241
Volume to Capacity	0.02	0.02	0.20	0.29
Queue Length 95th (ft)	1	1	18	29
Control Delay (s)	0.6	0.5	17.5	25.9
Lane LOS	A	A	C	D
Approach Delay (s)	0.6	0.5	17.5	25.9
Approach LOS			C	D

Intersection Summary				
Average Delay			3.3	
Intersection Capacity Utilization			51.2%	ICU Level of Service
Analysis Period (min)			15	
				A

Appendix E

Transportation Impact Analysis Assumptions Memorandum

FEHR PEERS

FEHR PEERS

MEMORANDUM

Date: Janurary 20, 2014

To: Heather Klein, City of Oakland
Shannon Allen, LSA

From: Sam Tabibnia

Subject: Children's Hospital and Research Center Oakland – Transportation Impact Analysis Assumptions

WC12-2940

This memorandum summarizes the assumptions that Fehr & Peers proposes to use in preparing the transportation impact analysis for the proposed expansion of Children's Hospital and Research Center Oakland (CHRCO).

This memorandum contains the following sections:

1. ***Existing Hospital Characteristics*** summarizes the characteristics of the existing hospital, including various buildings, population groups, and parking facilities.
2. ***Data Collection*** summarizes the data collected by Fehr & Peers and additional data provided by CHRCO.
3. ***Project Description*** describes the various components of the proposed project.
4. ***Transportation Characteristics*** describes the transportation characteristics of the proposed project including mode share, trip generation, and trip distribution. This section also lists the study intersections to be analyzed in the project environmental document.
5. ***Planned Transportation Network Changes*** summarizes the planned changes to the transportation network in the project vicinity.

We will use the information and assumptions presented in this memorandum to analyze the impacts of the proposed project on the transportation network as part of the environmental document for the project.

1. EXISTING HOSPITAL CHARACTERISTICS

The characteristics of the existing hospital, including various buildings, parking facilities and population types at the hospital are described below.

Location

As shown on **Figure 1**, CHCRO is located at 52nd Street and Martin Luther King Junior Way, adjacent to State Route (SR) 24 in Oakland, CA. The main campus consists of the following major buildings:

- **Main Hospital** – located at 747 52nd Street, the main hospital is bound by Martin Luther King Junior Way to the west, 52nd Street to the north, and SR 24 to the east and south. The hospital consists of several interconnected buildings that provide the main in-patient services at the hospital. The 280,000 square feet of building space house the emergency department and cafeteria, as well as various patient care departments. The Main Hospital provides 170 beds. The pick-up/drop off area and the emergency department access occurs at the Main Plaza, which can be accessed from both 52nd Street and Martin Luther King Junior Way. In addition, the Bruce Lyon Memorial Research Center and several temporary trailers are also located adjacent to the Main Hospital.
- **Outpatient Center Building 1 (OPC-1)** – this 116,000 square-foot building is located on the north side of 52nd street east of Martin Luther King Junior Way and serves outpatients. Departments located in this building include Anesthesiology, Orthopedics, Neurology, Rheumatology, Sports Medicine, and other clinics.

In addition, CHRCO owns and operates several former residential buildings along 52nd, 53rd, and Dover Streets.

Population

Population groups that use the hospital include the following:

- **Patients/Visitors** – About 1,480 patients and visitors visit the hospital on a typical weekday. About 610 patients are treated as outpatients, and 270 are either in inpatient beds or visit the Emergency Room. There are also about 600 visitors, which also includes vendors and contractors, at the hospital on a typical weekday,.[1]
- **Employees** – CHRCO has approximately 2,170 employees at the main campus, with about 160 employees at OPC-1, 1,760 employees at the main hospital, and 245 physicians. About 66 percent of the main hospital employees work during the day shift (between 7:00 AM and 3:00 PM), 24 percent work during the evening shift (between 3:00 PM and 11:00 PM), and 10 percent work during the night shift. OPC-1 staff primarily work during

[1] Based on data provided by CHRCO in October 2013.

the day shift, about two percent work during the evening shift and none work during the night shift.[2]

Parking Facilities

Parking demand by CHRCO's main campus is served by four main parking facilities, shown on **Figure 2** and described below:

- **Main Garage** – This garage, located just north of OPC-1, provides 650 parking spaces in five levels. It serves both patients/visitors and employees and has two exit gates and one entrance gate. Vehicles enter the garage from 52nd Street and exit either to 52nd Street or Martin Luther King Junior Way. Public parking at the main garage costs $1.50 per one-half hour up to $7.50 per day. For employees, day-time parking permits cost $30.00 and night-time parking costs $20.00 for a two-week period.
- **Physicians' Garage** – This 147-space garage is located in the ground and basement levels of the same structure as the Main Garage and can be entered by access-card only. It is primarily reserved for physicians and hospital senior management. The one exit gate and one entrance gate are adjacent to the main garage driveways and similar to the Main Garage, vehicles enter the garage from 52nd Street and exit either to 52nd Street or Martin Luther King Junior Way. Parking in the Physicians' Garage costs same as employee parking in the Main Garage.
- **West Lot** – This surface lot is reserved for employee parking only, and is located west of Martin Luther King Junior Way, between 47th and 51st streets. This lot provides 182 striped spaces and can accommodate up to about 50 additional vehicles using stacked valet parking, which is typically used about four days per week, nine months per year. Parking demand at other times of the year is at or below the striped parking capacity; therefore valet parking is not needed. Access to and from this lot is provided through gates on 51st Street (entrance only), Martin Luther King Junior Way (exit only), and 47th Street (exit only). Employee parking permits at the West Lot cost about $16.50 per two-week period.
- **South Lot** – This surface lot is reserved for employees only and is located east and south of the main hospital, with gated access on 52nd Street just east of Dover Street. The lot currently provides 48 parking spaces. Employee parking permits at the South Lot cost $16.50 per two-week period.

The former residential buildings on 52nd, 53rd, and Dover Streets also provide off-street parking facilities, such as garages or parking lots. Combined, these buildings provide about 30 off-street parking spaces that are primarily used by CHRCO staff.

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[2] Based on employee surveys conducted by Fehr & Peers in 2007 and data provided by CHRCO in September 2013.

Since the streets adjacent to the main campus provide unrestricted on-street parking, they are also used by CHRCO employees and patients/visitors.

2. DATA COLLECTION

Various data collected by Fehr & Peers is summarized below:

- Driveway Counts – Fehr & Peers counted vehicles entering and exiting the following locations for a 48-hour period on Tuesday and Wednesday, September 18 and 19, 2013[3]:
    - Main and Physicians' Garages
    - Main Plaza
    - West Lot
    - South Lot
- Patient/Visitor in-person surveys, consisting of a maximum of six questions, were conducted at the entrances to the Main Hospital and OPC-1 on November 6, 2007. **Appendix A** summarizes the results of the patient/visitor survey.[4]
- Employee mailback surveys, consisting of 12 questions were distributed by the hospital administration in December 2007. **Appendix B** summarizes the results of the employee survey.

In addition, CHRCO staff also provided data on current parking occupancies at different parking facilities, as well as data on existing and expected number of employees and patients/visitors at CHRCO's main campus. Based on data provided by CHRCO, staffing levels and number of patient/visitors to the site fluctuates throughout the year. Typically, winter months (January, February) have the highest amount of activity, while summer months (June through August) have the lowest amount of activity. Data collected in September represents above average activity at the hospital. Thus, data presented in this memorandum is conservative in estimating typical conditions at the hospital and no further adjustments to the collected September 2013 data are necessary.

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[3] The traffic data was collected on these days because they correspond to above-typical level of activity at CHRCO. Thus, the analysis that will be completed for the Draft EIR will represent typical peak conditions at the CHRCO main campus.

[4] Both the patient/visitor and employee surveys were conducted in 2007. **Appendix C** estimates the automobile trip generation for the existing site using the survey results and provides a comparison to the observed automobile trip generation in September 2013. The difference between the estimated and observed trip generation is less than five percent, which is within the expected daily fluctuation indicating that the results of the surveys continue to remain valid.

3. PROJECT DESCRIPTION

The proposed project is expected to be completed in two phases. Major components of each phase are described below:

- Phase 1 would consist of the following:
    - Construction of Outpatient Center Building 2 (OPC-2) at the northeast corner of Martin Luther King Junior Way/52nd Street intersection. The 89,100 square-foot building would primarily house outpatient services that are currently provided in the Main Hospital. It would also provide 20 Emergency Department parking spaces at the ground level with vehicular access on 52nd Street at the existing signalized driveway east of Martin Luther King Junior Way.
    - Interior renovation of the existing hospital resulting in temporary loss of 30 hospital beds during Phase 1.
    - Construction of additions to the Central Utility Plan in the main campus.
    - Modification of the existing Main Garage to provide a right-in/right-out only driveway on Martin Luther King Junior Way, which will result in elimination of 17 parking spaces.[5]
- Phase 2 would consist of the following:
    - Modification, removal, or relocation of certain existing residences along 52nd and 53rd Streets east of Dover Street and construction of Family Residence Building and Clinical Support Building.
    - Demolition of several buildings and removal of temporary trailers on the main campus and construction of Link Building and Patient Pavilion, which would add about 148,000 square feet of space and increase the bed count to 210.
    - Elimination of the existing 48-space South Lot and construction of a new 334-space parking garage at the south end of the main campus with access to and from 52nd Street, just east of Dover Street.
    - Potential closure of Dover Street to through traffic just south of 53rd Street.

[5] The EIR will also analyze traffic impacts under a project variant with main automobile access to the Main Garage on Dover Street, which may be closed off just south of 53rd Street to create a cul-de-sac, and no driveway access on Martin Luther King Junior Way.

Table 1 summarizes various aspects of the proposed project after completion of each phase of the project, including population forecasts provided by CHRCO. Based on communications with CHRCO in October and November 2013, these population forecasts are based on estimated demand for various services that reflect budgetary and operational constraints, such as potential competition with other medical centers and recent population trends at CHRCO. For example, total number of patient/visitors at CHRCO decreased by about 10 percent between 2007 and 2013. Thus, the forecasted increase in population are independent of and not proportional to the increase in the size of the Hospital.

After completion of Phase 2, CHRCO would have about 46 percent more space than current conditions. The number of employees, patient, and visitors are expected to increase by about 9 percent, 13 percent, and 26 percent, respectively.

4. TRANSPORTATION CHARACTERISTICS

Data collected by Fehr & Peers and provided by CHRCO were used to estimate transportation characteristics of the hospital, estimate trip generation for the proposed project, and select appropriate intersections for analysis in the project EIR. These are summarized below.

Current Transportation Demand Management (TDM) Strategies

Currently, CHRCO has in place the following TDM strategies reducing the number of single-occupant vehicle trips and encouraging other modes such as transit and biking:

- ***BART Shuttle*** – CHRCO operates a free shuttle between the MacArthur BART Station and the main campus for its employees, patients, and visitors. Currently, the shuttles operate on weekdays from 6:00 AM to midnight with approximately 15 minute headways. CHRCO operate 24-passenger shuttles during the day and eight-passenger shuttles during the evening and night. The shuttles currently transport about 455 passengers each day.[6]
- ***Commuter Tax Incentive*** – Employees have the option to deduct a predetermined amount from their paychecks to be used for transit-related expenses.
- ***Bicycle Parking*** – Bicycle parking for approximately 40 bicycle parking spaces is provided on the ground level of the Main Garage.
- ***TDM Management*** – CHRCO has an on-site parking and shuttle manager. In addition, transportation information is provided to all new employees during orientation.

[6] May 2013 ridership data provided by CHRCO.

TABLE 1
CHRCO PROJECT CHARACTERISTICS

Metric	Existing (2013)	Phase 1	Phase 2	Existing to Phase 1		Phase 1 to Phase 2		Existing to Phase 2	
				Absolute	Percent	Absolute	Percent	Absolute	Percent
Building Area (KSF)	700	789	1,025	89	13%	236	30%	325	46%
Bed Counts	170	140	210	-30	-18%	70	50%	40	24%
Outpatient Exam Rooms	81	93	93	12	15%	0	0%	12	15%
Parking Spaces	1,086	1,089	1,375	3	0%	286	26%	289	27%
Population [1]									
Employees									
OPC-1 Employees	160	160	160	0	0%	0	0%	0	0%
OPC-2 Employees	0	235	235	235	N/A	0	0%	235	N/A
Hospital Employees	1,761	1,551	1,710	-210	-12% [2]	159	10%	-51	-3%
Physicians	245	245	266	0	0%	21	9%	21	9%
Employee Subtotal	2,166	2,191	2,371	25	1%	180	8%	205	9%
Patients and Visitors									
In-patients	270	270	340	0	0%	70	26%	70	26%
Outpatients	605	648	648	43	7%	0	0%	43	7%
Visitors [3]	604	604	761	0	0%	157	26%	157	26%
Patients and Visitors Subtotal	1,479	1,522	1,749	43	3%	227	15%	270	18%
Total Population	**3,645**	**3,713**	**4,120**	**68**	**2%**	**407**	**11%**	**475**	**13%**

1. Population forecasts are approximate.
2. Hospital employees decrease after Phase 1 because most of them will move to OPC-2.
3. Visitors include vendors and other non-patients.

Source: CHRCO, 2013.

Mode Share

Employees, patients, and visitors use a variety of modes to travel to and from CHRCO. Information obtained from the employees and patient/visitor surveys was used to estimate the percentage of these population groups that use each transportation mode. **Table 2** summarizes mode choice for both employees and patient/visitors.

TABLE 2
MODE CHOICE SUMMARY

Access Mode	Employees	Patients/Visitors
Drive Alone	81%	21%
Carpool [1]	7%	58%
Drop off/Pick-up	1%	8%
BART and Shuttle [2]	7%	4%
AC Transit	<1%	5%
Walk/Bike	3%	3%
Others (includes Taxis, Paratransit)	<1%	1%
Total	***100%***	***100%***

1. Average carpool occupancy is 2.4 passengers per vehicle for employees and 2.7 passengers per vehicle for patients and visitors.
2. It is assumed that all employees and patients/visitors that use BART, also use the shuttle to travel between CHRCO and the BART Station.

Source: Data collected by Fehr & Peers in 2007.

The majority of trips by employees (81 percent) is by single-occupant vehicles. About seven percent of employees carpool, seven percent use BART and the shuttle, three percent walk or bike, one percent are picked-up and dropped off, and less than one percent use other modes such as bus, taxis, or other modes.

Since most patients at CHRCO cannot drive (i.e., they are underage), the majority of trips by patients/visitors (58 percent) is by carpool. About 21 percent of patients/visitors travel by single-occupant vehicles. These trips are mostly by visitors to the hospital. About eight percent of patients/visitors are picked-up and dropped off, five percent use AC Transit, four percent use BART and the shuttle, three percent walk or bike, and about one percent use other modes such as taxis and paratransit.

Current Vehicle Trip Generation

The amount of traffic currently generated by CHRCO is primarily estimated based on driveway counts collected in September 2013. Although traffic data was collected over a two-day period, the day with the highest amount of traffic was selected for analysis. Drop-off/pick-ups and on-street parking are accounted for by using data from the employee and patient/visitor surveys and observations at the site. **Figure 3** shows the inbound, outbound, and total vehicle trip generation profile by hour for a typical weekday. See **Appendix D** for more detailed information by parking facility.

As shown on Figure 3, total traffic generated by the site peaks between 7:30 and 8:30 AM and between 4:30 and 5:30 PM.[7] Most traffic enters the site during the morning peak, while most traffic exits the site during the peak afternoon period.

Table 3 summarizes the daily and AM and PM peak hour vehicle trip generation by parking facility. Currently, CHRCO generates about 5,690 vehicle trips (both in and out) on a typical weekday. The site generates about 450 trips during the AM peak hour (7:30 to 8:30 AM) and about 470 trips during the PM peak hour (4:30 to 5:30 PM). As shown in Table 3, slightly less than half of all trips are to and from the Main Garage, while about 15 percent use on-street parking. Based on the driveway counts, results of the patient/visitor and employee surveys, and parking data provided by CHRCO, it is estimated that about 70 percent of all trips are generated by site employees.

Trip Generation Comparison

Table 4 compares the observed trip generation rates at CHRCO with data published for hospitals by Institute of Transportation Engineers' (ITE) *Trip Generation Manual, 9th Edition* for different variables. In comparison to ITE data, the observed trip generation rates at CHRCO based on size (thousand square feet) and employees are about 25 to 40 percent lower, while the trip generation rates based on number of beds is about 100 percent or more higher.

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[7] As previously stated on page 2 of this memorandum, the day shift at the hospital, which has the highest number of employees, ends at 3:00 PM. However, based on observations, the afternoon peak hour of traffic is between 4:30 and 5:30 PM. Note that as shown on Figure 3, the hour before the peak hour (3:30 to 4:30 PM), which generally corresponds with the end of the day shift at the hospital, generates only slightly fewer trips. In addition, as shown in Question 4 in Appendix B, more CHRCO employees, which includes both hospital and OPC-1 employees, leave between 4:00 PM and 6:00 PM, indicating that many employees routinely continue to work after their shift ends. In addition, the peak hour traffic also includes patients and visitors.

TABLE 3
CURRENT TRIP GENERATION SUMMARY

Facility	Daily Total	AM Peak Hour (7:30 – 8:30 AM)			PM Peak Hour (4:30 – 5:30 PM)		
		In	Out	Total	In	Out	Total
Main Garage	2,730	146	71	217	51	177	228
Physicians Garage	450	30	27	57	5	26	31
West Lot	490	42	6	48	2	48	50
South Lot	240	14	3	17	8	17	25
Main Plaza	910	26	24	50	28	31	59
Other/On-Street [1]	870	40	16	56	20	56	76
Total	***5,690***	***298***	***147***	***445***	***114***	***355***	***469***

1. Other trips include trips by drop-off/pick-up of employees and patients/visitors, delivery trucks, etc. Trips by vehicles parking on-street estimated based on the results of the employee and patient/visitor surveys.

Source: Fehr & Peers, 2013.

TABLE 4
TRIP GENERATION RATE COMPARISON

Source	Daily	AM Peak Hour	PM Peak Hour
CHRCO [1]			
Rate per KSF	8.13	0.64	0.67
Rate per Employee	2.63	0.21	0.22
Rate per Bed	33.47	2.62	2.76
ITE [2]			
Rate per KSF	13.22	0.95	0.93
Rate per Employee	4.50	0.31	0.29
Rate per Bed	12.94	1.32	1.42

1. Based on CHRCO characteristics presented in Tables 2 and total project trip generation presented in Table 3.
2. Based on average rates published in ITE *Trip Generation (9th Edition) for* land use category 610 (Hospital)

Source: Fehr & Peers, 2013.

Various factors, such as setting (urban or suburban), shift change times, types of services provided (inpatient or outpatient), or types of patients (children or adults) may account for the difference in ITE data and observed trip generation at CHRCO.

Vehicle Trip Generation Rates

As shown in Table 1, the proposed project would increase the size of CHRCO by about 46 percent at buildout, while the number of employees and patient/visitors are expected to increase by nine percent and 18 percent, respectively. Population is not expected to increase at the same rate as the overall size because the proposed facilities would be designed to accommodate current design standards and patient-care technologies that require more building square footage per patient.

For example, the Pediatric and Neonatal Intensive Care Unit (PICU and NICU) in the current hospital are ward-style with about 300 square feet per bed; in comparison, the PICU and NICU in the proposed hospital would be in single or double-occupancy rooms with about 500 to 590 square feet per bed.

Since building square footage per bed and per staff would increase regardless of an increase in staff and/or patients, building square footage is not the best indicator of the amount of traffic the future project would generate.

The increased activity and associated traffic will be caused by the increase in the number of employees and patients/ visitors. Therefore, projected increases in total population (employees and patient/visitors combined) are used to calculate trip generation for the project. This presumes that the future hospital would continue to have similar characteristics as the existing hospital, such as similar services, similar parking supply, and continue to provide the BART shuttle service.

Based on the current population of 3,645 (2,166 employees and 1,479 patients/visitors) and current trip generation counts, CHRCO has the following automobile trip generation rates per population:

- Daily = 1.56 trips per person[8]
- AM Peak Hour = 0.12 trips per person[9] (67% in, 33% out)

[8] Based on 5,690 daily trips (Table 3) divided by population of 3,645 (Table 1)

[9] Based on 445 AM peak hour trips (Table 3) divided by population of 3,645 (Table 1)

- PM Peak Hour = 0.13 trips per person[10] (24% in, 76% out)

Proposed Project Trip Generation

As shown in Table 1, CHRCO population is estimated to increase by about 13 percent while the project size would increase by about 46 percent at project buildout. As previously described, the population forecasts in Table 1 were estimated independent of the project size. They are generally based on current trends and other budgetary and operational constraints at CHRCO and present best estimates for activity levels at CHRCO at buildout.

Since automobile trip generation is correlated to population, this analysis proposes to modify the population estimates prepared by CHRCO to present a more conservative analysis of project traffic impacts in the EIR based on a higher activity level than can be accommodated at the site. As previously discussed, the overall square footage of the proposed project would not be an accurate indicator of overall level of activity at CHRCO. Thus, this analysis uses other characteristics of the physical space to estimate an increase in total population proportional to the increase in space.

As shown in Table 1, the project would increase the number of exam rooms (indicator of outpatient activity) by about 15 percent and the number of beds (indicator of inpatient activity) by about 24 percent. Therefore, this analysis will increase the project population related to outpatient services by 15 percent and inpatient services by 24 percent. Under these conservative assumptions, CHRCO total population would increase by about 4 percent after Phase 1 and 22 percent after Phase 2, which are higher than the forecasted increase of 2 percent at the end of Phase 1 and 13 percent at Phase 2 that was previously presented. The proposed estimates in population increase are more conservative than the population forecasts estimated by CHRCO and less likely to occur; however, they will result in a more conservative traffic impact analysis for the EIR that reflects the increase in size of the proposed project but account for the decompression of current services in a larger hospital.

Based on the trip generation rates described above, **Table 5** summarizes project trip generation at the end of Phases 1 and 2. At the end of Phase 1, the proposed project is estimated to generate about 240 additional daily trips and 18 additional AM peak hour and 19 additional PM peak hour trips. At buildout, the proposed project is estimated to generate about 1,230 additional daily, 96 additional AM peak hour, and 102 additional PM peak hour automobile trips.

[10] Based on 469 PM peak hour trips (Table 3) divided by population of 3,645 (Table 1)

TABLE 5
PROPOSED PROJECT TRIP GENERATION

Phase	Total Population[1]	Trip Generation						
		Daily	AM Peak Hour (7:30 – 8:30 AM)			PM Peak Hour (4:30 – 5:30 PM)		
			In	Out	Total	In	Out	Total
Totals for Existing and Each Phase[2]								
Existing	3,645	5,690	298	147	445	114	355	469
Phase 1	3,796	5,930	310	153	463	119	369	488
Phase 2	4,435	6,920	362	179	541	139	432	571
Net Changes								
Existing to Phase 1	151	240	12	6	18	5	14	19
Phase 1 to Phase 2	638	990	52	26	78	20	63	83
Existing to Phase 2	790	1,230	64	32	96	25	77	102

1. Based on data provided by CHRCO, total population includes employees and patient/visitors. See Table 2 for more detail.
2. Trip generation based on following rates based on existing observations:
   Daily = 1.56 trips per person
   AM Peak Hour = 0.12 trips per person (67% in, 33% out)
   PM Peak Hour = 0.13 trips per person (24% in, 76% out)

Source: Fehr & Peers, 2013.

Trip Distribution

Trip distribution is defined as the directions of approach and departure that vehicles would use to arrive at and depart from the site. CHRCO staff provided Fehr & Peers with the residence ZIP code information of employees and patient/visitors. The ZIP code data was geocoded using ArcView, Geographical Information System (GIS) software, to determine the trip distribution by user group. **Figures 4 and 5** provide the residence distribution of current CHRCO employees and patients, respectively. About half of both employees and patients live within 10 miles of the project site. Based on the residence locations, most employees and patients use the freeways to arrive at and depart from the site. This analysis assumes that visitors would have the same trip making characteristics as the patients. The trip generation estimates contain trips for employees and patients/visitors. As shown on Figures 4 and 5, both employees and patients use similar roadways at similar levels to access the site. Therefore, one pattern was developed for all trips generated by the proposed project. Overall, trips to and from the CHRCO have the following trip distribution:

- I-80 (West), 3 percent
- I-80 (East), 17 percent
- I-580 (East), 30 percent
- I-980, 22 percent
- SR 24 (East), 13 percent
- Local (Martin Luther King Jr. Way, Telegraph Avenue, etc.), 15 percent

All freeways, except SR 24 (East) can be accessed from the on-ramp and off-ramp on Martin Luther king Junior Way, just south of the project site. The nearest access to and from SR 24 (East) is provided through ramps on Telegraph Avenue northeast of the project site.

Trip Assignment and Study Intersections

The new trips generated by the proposed project, as shown in Table 5, were assigned to the roadway network according to the trip distribution described in the previous section. **Figure 6** shows the resulting peak hour trip assignment by roadway segment at buildout, assuming that all vehicles would use the major streets, such as Martin Luther King Junior Way, Telegraph Avenue, and 52nd Street, to travel to and from the site.

Based on the proposed trip assignment, the following intersections are proposed for analysis:

1. Martin Luther King Junior Way/55th Street
2. Dover Street/55th Street
3. Shattuck Avenue/55th Street
4. Telegraph Avenue/55th Street
5. Martin Luther King Junior Way/54th Street
6. Dover Street/54th Street
7. Shattuck Avenue/54th Street
8. Martin Luther King Junior Way/53rd Street
9. Dover Street/53rd Street
10. Martin Luther King Junior Way/52nd Street
11. 52nd Street/CHRCO Garage Driveways
12. 52nd Street/Dover Street/Hospital Driveway
13. 52nd Street/SR 24 On-Ramp/SR 24 Off-Ramp
14. 52nd Street/Shattuck Avenue
15. 52nd Street/Telegraph Avenue/Claremont Avenue
16. 51st Street/Telegraph Avenue
17. 47th Street/SR 24 On-Ramp/SR 24 Off-Ramp/Martin Luther King Junior Way
18. West Street/52nd Street
19. Genoa Street/52nd Street
20. Genoa Street/55th Street

We will analyze traffic operations at these intersections for the highest hour during the AM peak period (7:00 AM to 9:00 AM) and during the PM peak period (3:00 PM to 6:00 PM).

These intersections were generally selected to identify likely locations where the proposed project may significantly alter travel patterns. In general, study intersections were selected if they provide immediate access to the project site, or where the proposed project would increase traffic volumes by 50 or more peak-hour vehicle at signalized intersections, or ten or more peak hour vehicles on the controlled approach of unsignalized intersections.

Considering the current level of congestion on main arterials, such as Martin Luther King Junior Way and Telegraph Avenue, the additional traffic generated by the proposed project, or changes in traffic patterns caused by the proposed project, may result in additional traffic on the adjacent residential streets. Therefore, intersections along these residential streets that may be affected by the proposed project are also included in the list of study intersections.

Construction of new parking facilities, elimination of existing parking facilities, and potential changes in parking supply and/or access points of existing parking facilities, would also affect traffic patterns in the project vicinity. The traffic assignment shown on Figure 6 does not reflect these changes, because they would only affect intersections in the immediate vicinity of the project site and are not expected to require analysis of additional intersections. The EIR will address these changes in traffic patterns.

The project analysis in the EIR will assume that a right-in/right-out only driveway on Martin Luther King Junior Way would provide access to the existing Main Garage and that Dover Street between 52nd and 53rd Street would continue to remain open to through automobile traffic. The EIR will analyze project variants that assume access to the Main Garage would be provided through a driveway on Dover Street and that Dover Street would be closed to through traffic just south of 53rd Street.

5. PLANNED TRANSPORTATION NETWORK CHANGES

This section summarizes planned changes to the transportation network in the vicinity of the proposed project. Planned changes include improvement projects planned by the City of Oakland or mitigation measures proposed by other development projects. These are changes that are not related to the proposed project and would be implemented regardless of the CHRCO project. Changes that have full approval and funding would be assumed in the analysis of future conditions in the project EIR. However, not all of the planned changes have finalized design plans, full approvals, and/or funding. Changes lacking final design, full approval, and/or full funding are not considered reasonably foreseeable, and therefore would not be assumed in the analysis of future conditions. Planned changes by travel mode are summarized below

Planned Roadway Changes

There are no planned roadway changes in the vicinity of the proposed project or at any of the recommended study intersections.

Planned Transit Changes

There are no planned changes to the transit service in the vicinity of the proposed project.

Planned Bicycle/Pedestrian Changes

Planned bicycle facilities in the project vicinity include:

- City of Oakland is designing a combination of Class 2 bicycle lanes and Class 3A arterial bicycle routes on Shattuck Avenue between Telegraph Avenue and the City of Berkeley. Since the project would not modify the existing travel lane configurations or controls at the study intersections, it would not affect the intersection operations analysis. This project is approved, fully funded, and scheduled to be completed in 2013. Therefore, this project will be assumed in the analysis of existing and future conditions.

In addition, the City of Oakland *Bicycle Master Plan Update*, as adopted in December 2007, proposes the following improvements to the bicycle facilities in the project vicinity:

- Provide Class 2 bicycle lanes along Telegraph Avenue. Telegraph Avenue (Aileen Street to 20th Street) is provisionally designated as part of the proposed bikeway network. The City of Oakland is currently studying various options for Telegraph Avenue as part of a Complete Streets project. Currently, there is no finalized design, and the improvement does not have full funding or approval. Therefore, this project will not be assumed in the analysis of future conditions.
- Class 3A Arterial Bicycle Routes on 51st Street/Pleasant Valley Avenue, east of Shattuck Avenue. Since the project would not modify the existing travel lane configurations or controls at the study intersections, it would not affect the intersection operations analysis. Currently, there is no funding for this improvement. Therefore, this project will not be assumed in the analysis of future conditions.

In addition, the Caldecott Tunnel Improvement Project Settlement Agreement includes the following improvement projects in the vicinity of CHRCO:

- Claremont Avenue /52nd Street/Telegraph Avenue intersection – Eliminate the slip right-turn lane from northbound Telegraph Avenue to Claremont Avenue, upgrade traffic signal control equipment to allow countdown pedestrian signal heads. This improvement is currently not expected to be funded. Therefore, it is not included in the analysis of future conditions.

- 52nd Street/Shattuck Avenue intersection - Install a traffic signal at eastbound SR 24 off-ramp on 52nd Street just west of Shattuck Avenue and coordinate with the existing signal, Tee 52nd Street into 51st Street. This improvement is currently not expected to be funded. Therefore, it is not included in the analysis of future conditions.

Attachments:

Figures:

Figure 1 - Project Location

Figure 2 - Main Campus

Figure 3 - Weekday Vehicle Trip Generation Profile

Figure 4 - Patient Residence Distribution by ZIP Code

Figure 5 - Employee Residence Distribution by ZIP Code

Figure 6 - Peak Hour Traffic Assignment and Proposed Study Intersections

Appendices:

Appendix A - CHRCO – Patient/Visitor Survey Results

Appendix B - CHRCO – Employee Survey Results

Appendix C - Survey Results Validation

Appendix D - CHRCO Trip Generation Data Summary

Figure 1.

Project Location

WC12-2940_1_ProjLoc

FEHR PEERS

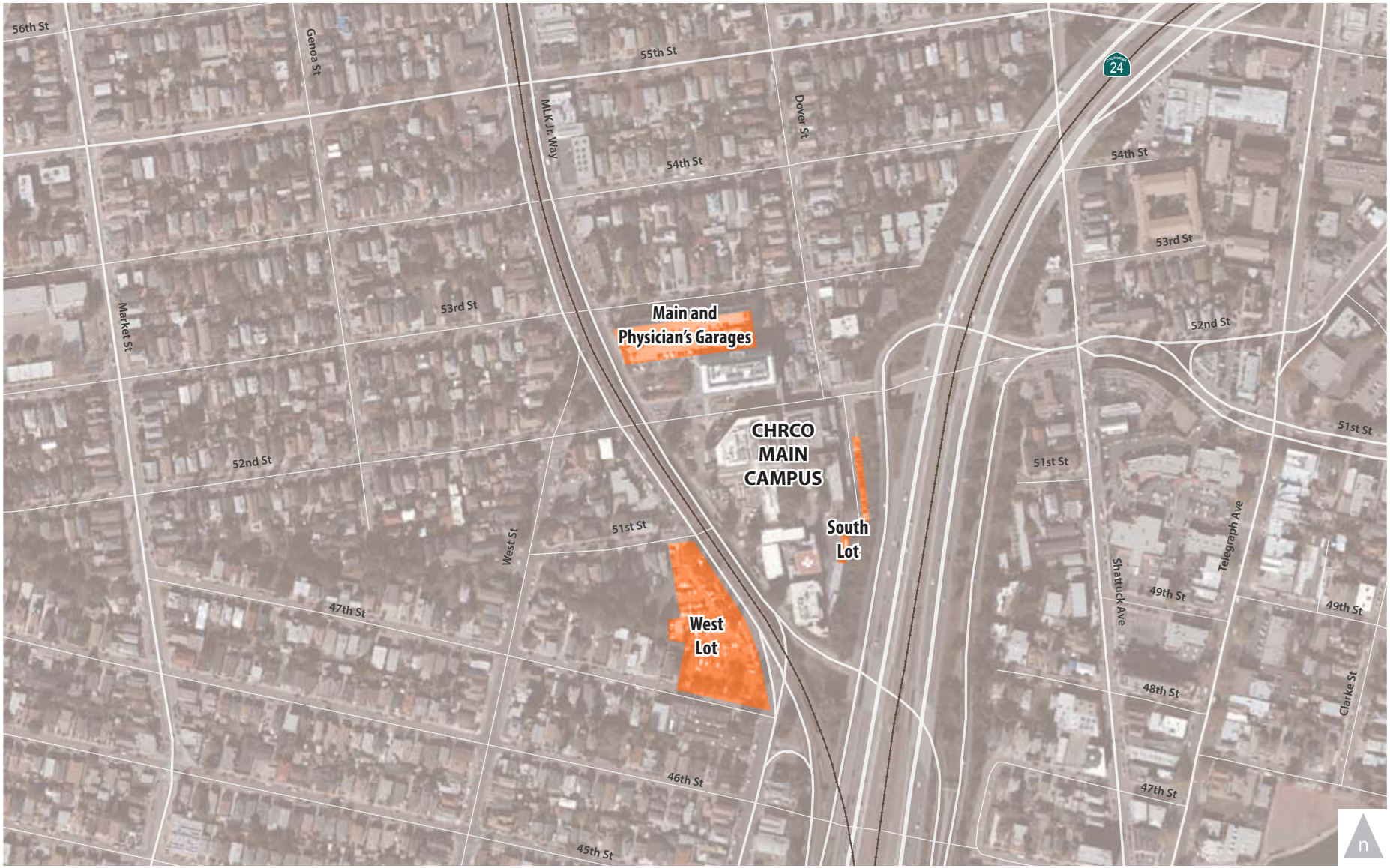

Figure 2.

Main Campus

WC12-2940_2_MainCampus

FEHR PEERS

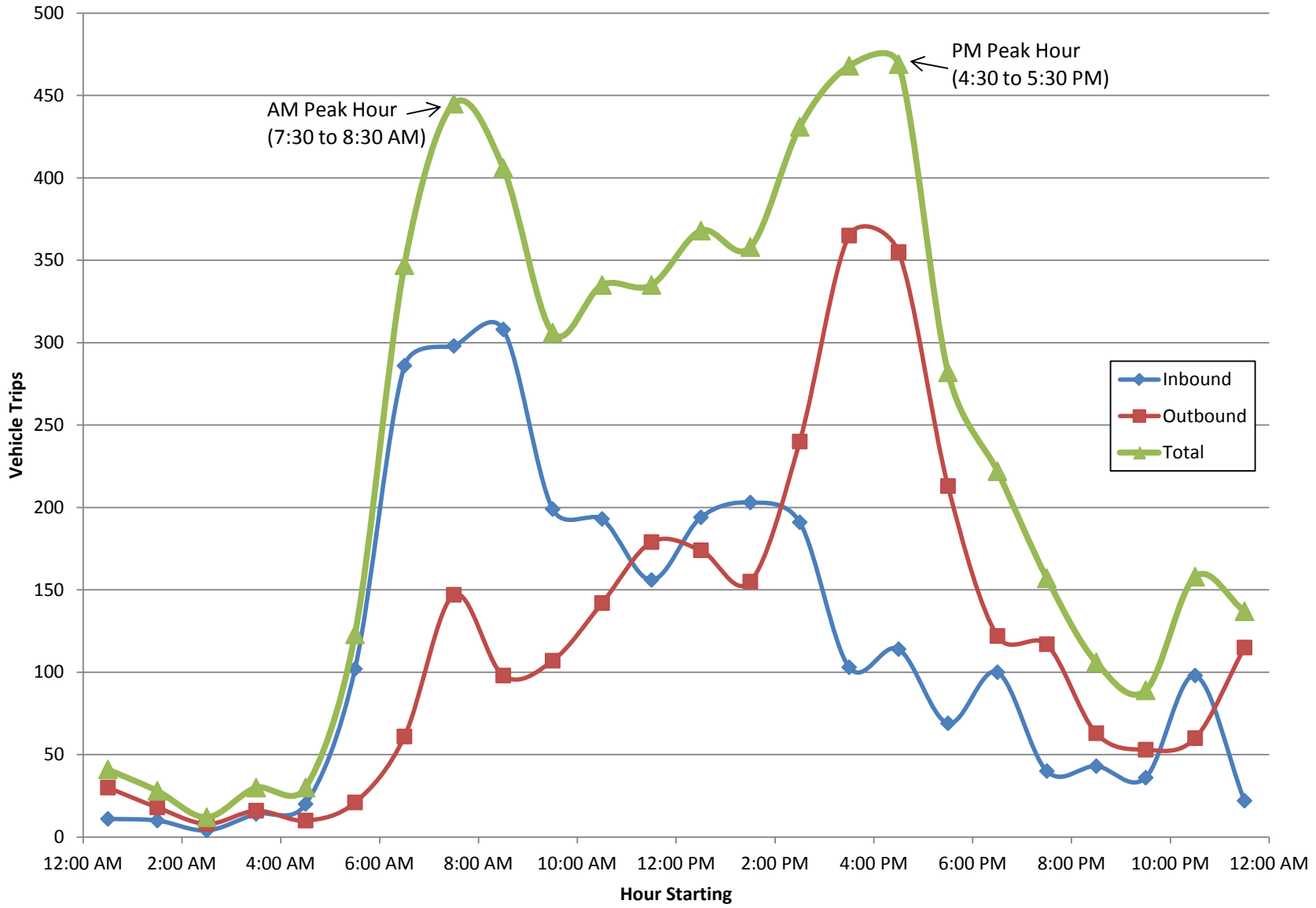

Figure 3.

Weekday Vehicle Trip Generation Profile

WC12-2940_3_WkdyTripGen

FEHR PEERS

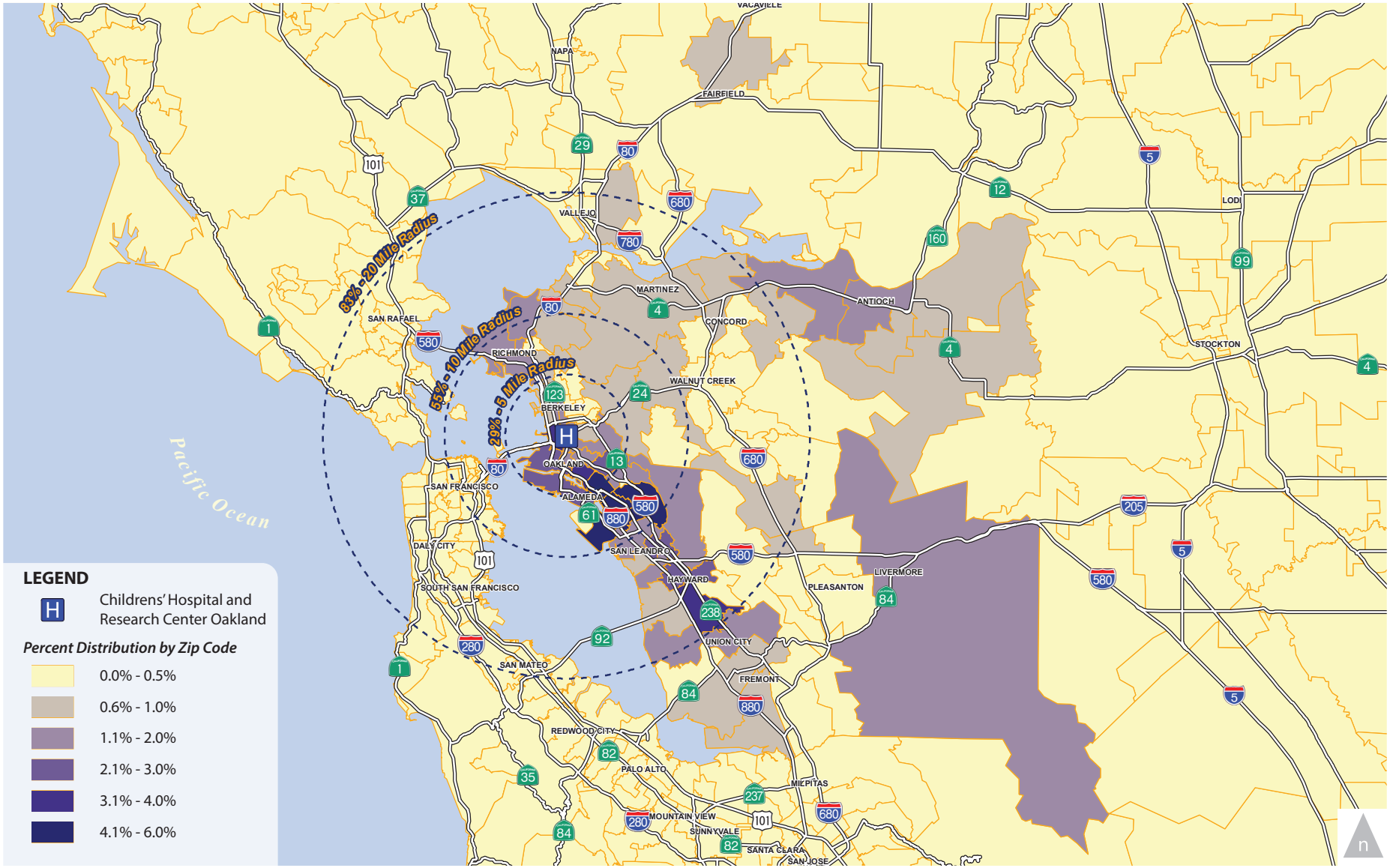

Figure 4.

Patient Residence Distribution by ZIP Code

WC12-2940_4_PatientZip

FEHR & PEERS

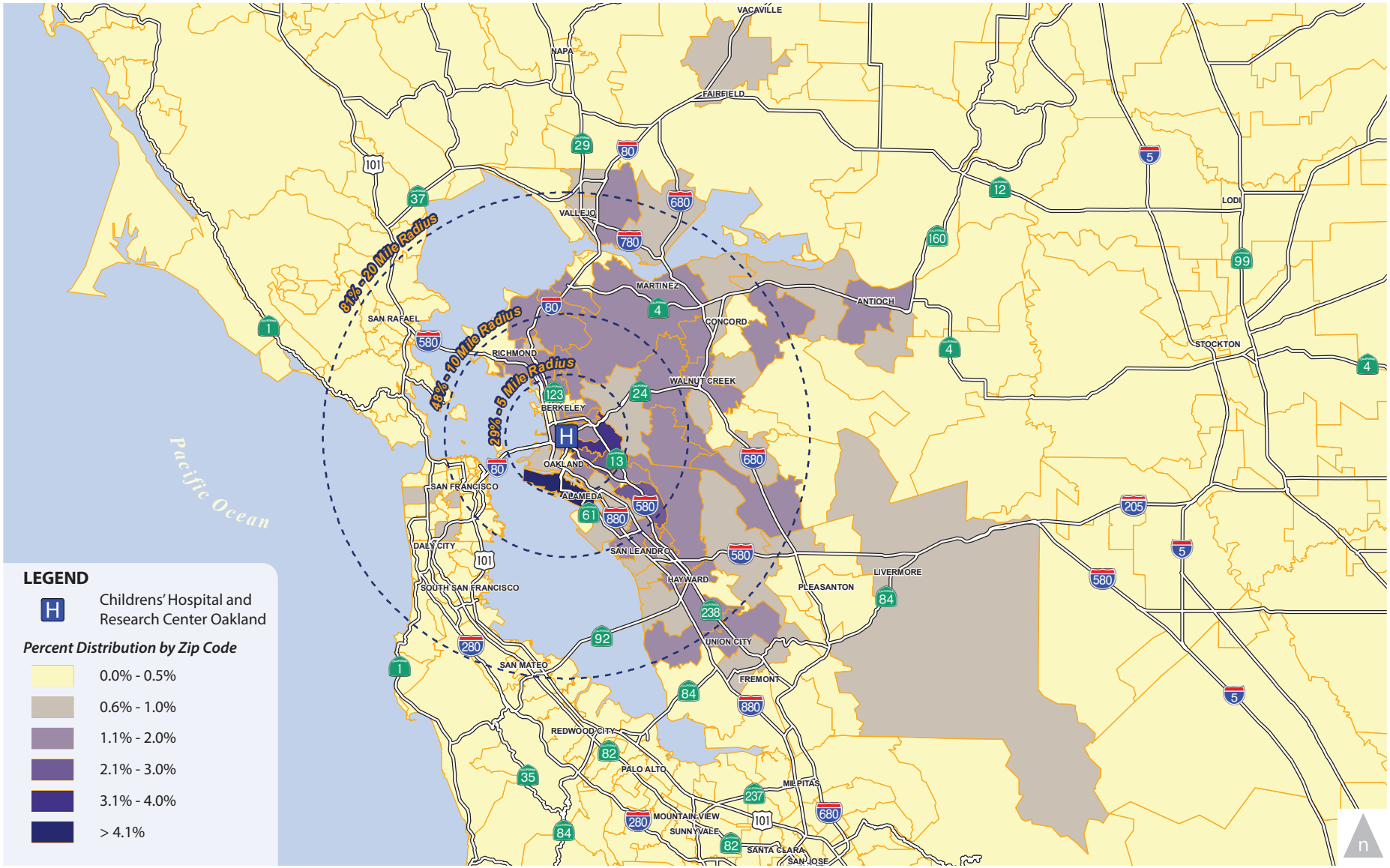

Figure 5.

Employee Residence Distribution by ZIP Code

WC12-2940_5_EmployeeZip

FEHR & PEERS

Figure 6.

Peak Hour Traffic Assignment and Proposed Study Intersection Locations

WC12-2940_6_TrafAssgnStudyLoc

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Appendix A

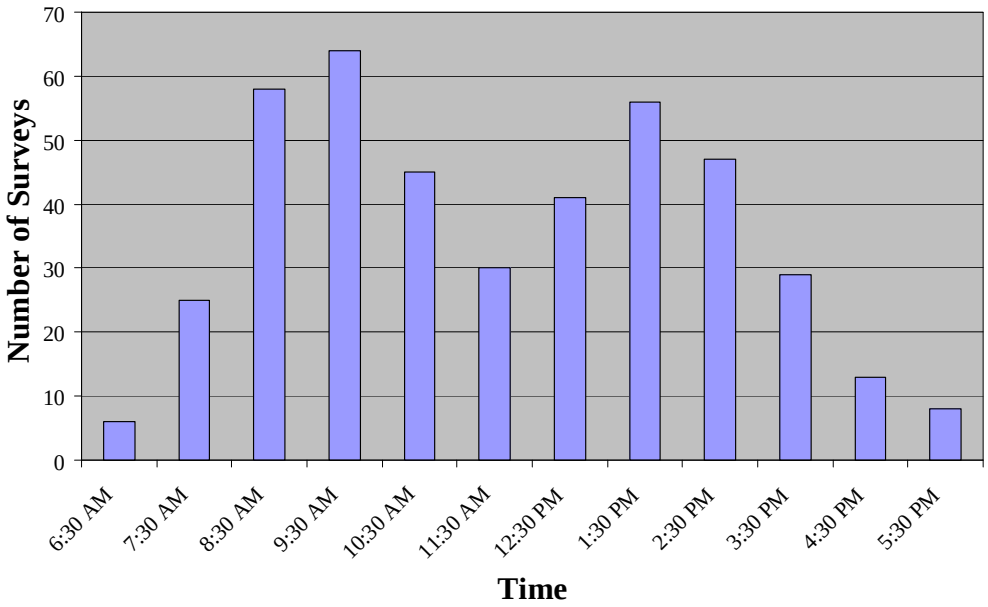
Children's Hospital Oakland – Patient/Visitor Survey Results

Fehr & Peers conducted in-person surveys of Hospital patients and visitors on November 8th, 2007 between 6:30 AM and 6:30 PM. The surveys of entering patients and visitors were conducted at the main entrance of the Hospital and the Outpatient Center. A sample survey is provided on Figure 1.

As part of the survey, 428 parties were interviewed. Based on data provided by hospital administration, about 995 parties visited the hospital on that day. This corresponds to a 43 percent survey response rate. The 95 percent confidence interval[1] for a sample size of 428 out of a population of 995 is plus-or-minus 3.6 percent.

The survey questions followed by responses to each survey question are summarized below.

Question 1: Time of Arrival



Paitent/visitor arrivals peak at about 9:30 to 10:30 AM and also between 1:30 and 2:30 PM. It decreases in the mid-day between 11:30 AM and 12:30 PM.

[1] Confidence interval is a statistical term to describe the reliability of survey results. For example, 95 percent confidence interval of plus-or-minus 2.8 percent means that we can be 95 percent certain that the true percentage of the population would be between 3.6 percent above or below the survey result.

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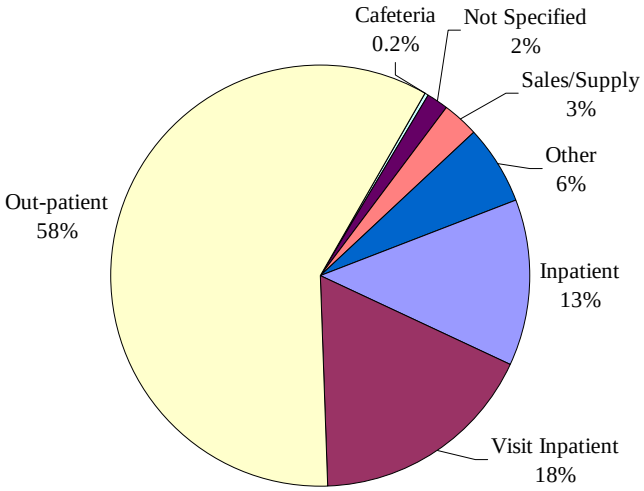
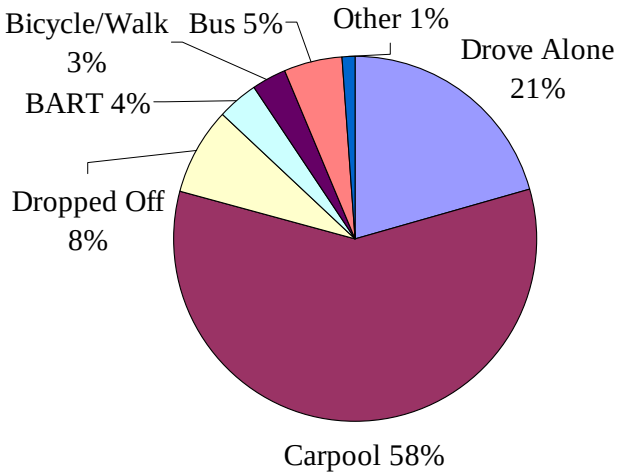
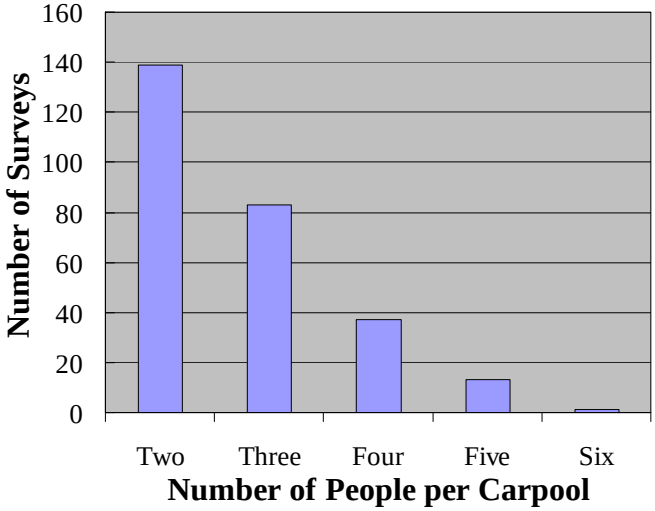
Question 2: What is the purpose of this visit?



About 58 percent of visiting parties were outpatient-related and 31 percent were there for inpatient services (13 percent were inpatients and 18 percent were visiting inpatients). About three percent were there for sales or supply-related reasons.

Question 3: How did you get to the hospital today?





About 58 percent of patients/visitors carpooled and 8 percent were dropped off at the hospital. About 21 percent drove alone and 12 percent traveled using bus, bicycle, walking, or BART.

About 79 percent of outpatient trips traveled in a carpool of two or more people, compared to 57 percent of inpatient trips. Only 11 percent of outpatient trips were drive-alone trips, compared with 24 percent of inpatient trips.

About 51 percent of carpools consisted of two people, and higher carpool occupancy occurred less often than lower occupancy. The average vehicle occupancy for carpools, including the driver, is 2.7 persons per vehicle.

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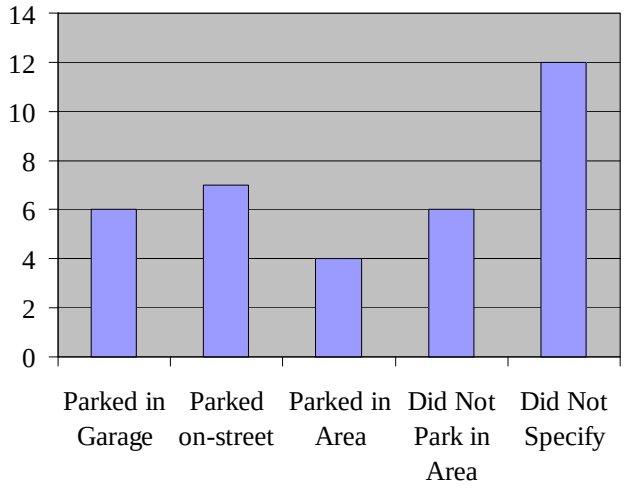
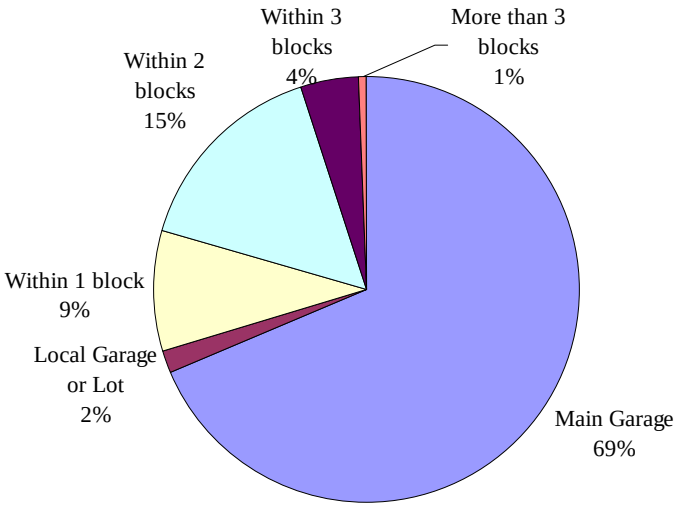
Question 4: If you were a passenger, were you dropped off and did the driver park in the area?



Of the 35 parties that indicated they were dropped off, 17 indicated the driver parked in the area, 6 indicated the driver did not park in the area, and 12 did not specify. As a percentage of the 23 respondents who specified, 74 percent parked in the area and 26 percent did not.

Of the 17 passengers who indicated the driver parked in the area, 13 specified where the driver parked; 46 percent parked in the main garage, and the remainder parked on-street.

Question 5: Where did the driver park?



About 69 percent of drivers parked in the main garage, and 29 percent parked on-street. Among the drivers who parked on-street, 83 percent parked within two blocks of the hospital.

About 73 percent of outpatient visitors parked in the main garage, compared with 61 percent of inpatient visitors and 64 percent of sales/supply visitors.

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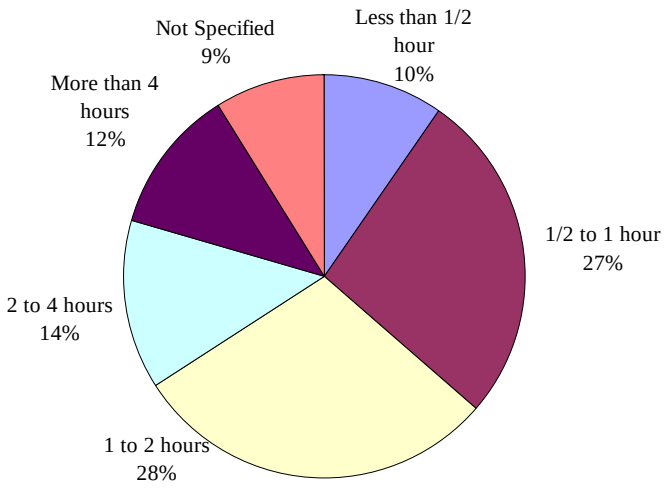
Question 6: How long do you expect to be at the hospital?



About 55 percent of parties expected to stay at the hospital between 30 minutes and two hours, 10 percent expected to stay for less than half an hour, and 12 percent expected to stay for more than four hours. About 52 percent of parties that drove private vehicles and expected to be at the hospital for less than 30 minutes consisted of one person; only 22 percent of parties expecting to be at the hospital for more than 30 minutes and drove personal vehicles consisted of one person. An average of 69 percent of drivers parked in the main garage, but 39 percent of parties expecting to stay less than 30 minutes and 84 percent of parties expecting to stay longer than four hours did so.

CHILDREN'S HOSPITAL OAKLAND VISITOR SURVEY

1. Please indicate time of arrival: _____AM PM

2. What is the purpose of this visit?

   _____ Inpatient
   _____ Visit Inpatient
   _____ Out-patient
   _____ Visit/Accompany out-patient
   _____ Sales/Supply
   _____ Cafeteria
   _____ Other (please specify) _____

3. How did you get to the hospital today?

   _____ Drive Alone
   _____ Carpool
   _____ # people in car
   Circle one: Driver or Passenger
   _____ Bus (AC Transit)
   _____ Shuttle (Children's Hospital)
   _____ BART
   _____ Motorcycle
   _____ Bicycle/Walk
   _____ Other (please specify) _____

4. If you were a passenger, were you dropped off and did the driver park in the area?

   _____ Dropped off
   _____ Parked in area
   _____ Did not park in area

5. If you arrived by car, where did you or the driver park?

   _____ Main Garage
   _____ Other Garages and Lots
   _____ On-street:
   _____ Within 1 block
   _____ Within 2 blocks
   _____ Within 3 blocks
   _____ More than 3 blocks

6. How long do you expect to be at the hospital?

   _____ Less than ½-hour
   _____ ½ to 1-hour
   _____ > 1 to 2 hours
   _____ > 2 to 4 hours
   _____ > 4 hours

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Appendix B

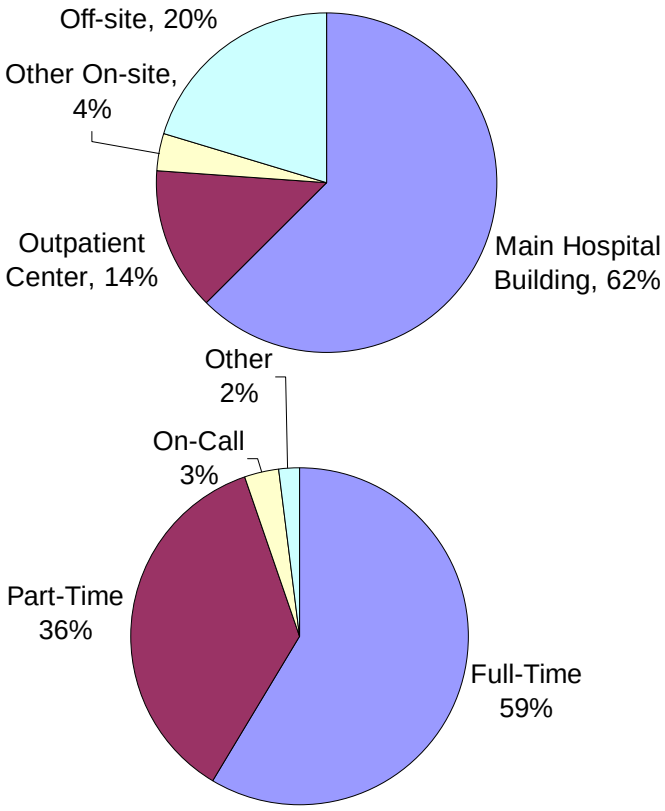
Children's Hospital Oakland – Employee Survey Results

Fehr & Peers conducted mailback surveys of Hospital employees in December 2007. The surveys were distributed and collected by the hospital administration to all staff at the main campus. A sample survey is provided as an attachment.

At the time, the hospital had approximately 2,220 employees at the main campus. Of these, 779 surveys were returned, corresponding to a 35 percent respond rate. The 95 percent confidence interval[1] for a sample size of 779 out of a population of 2,220 is plus-or-minus 2.8 percent.

The survey questions followed by responses to each survey question are summarized below.

Question 1: What is your primary work location?



About 62 percent of survey respondents work in the main hospital building, 14 percent work in the outpatient center, and four percent work at the Bruce Lyon Memorial Building or the Psychiatry/Human Resources building. The remaining 20 percent of employees primarily worked offsite; data from their surveys were not included in the rest of the responses and not used in the analysis.

Question 2: What type of schedule do you work?

About 59 percent of survey respondents work a full-time schedule, 36 percent work part-time, and three percent work on-call.

[1] Confidence interval is a statistical term to describe the reliability of survey results. For example, 95 percent confidence interval of plus-or-minus 2.8 percent means that we can be 95 percent certain that the true percentage of the population would be between 2.8 percent above or below the survey result.

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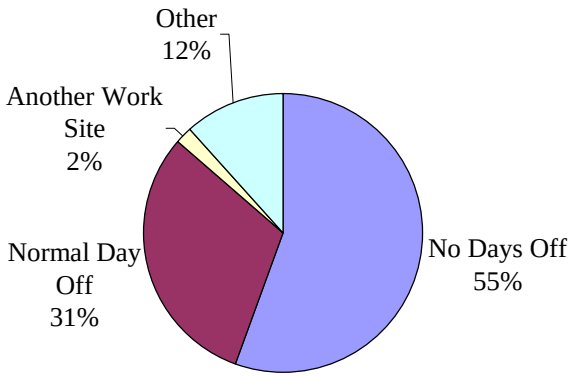
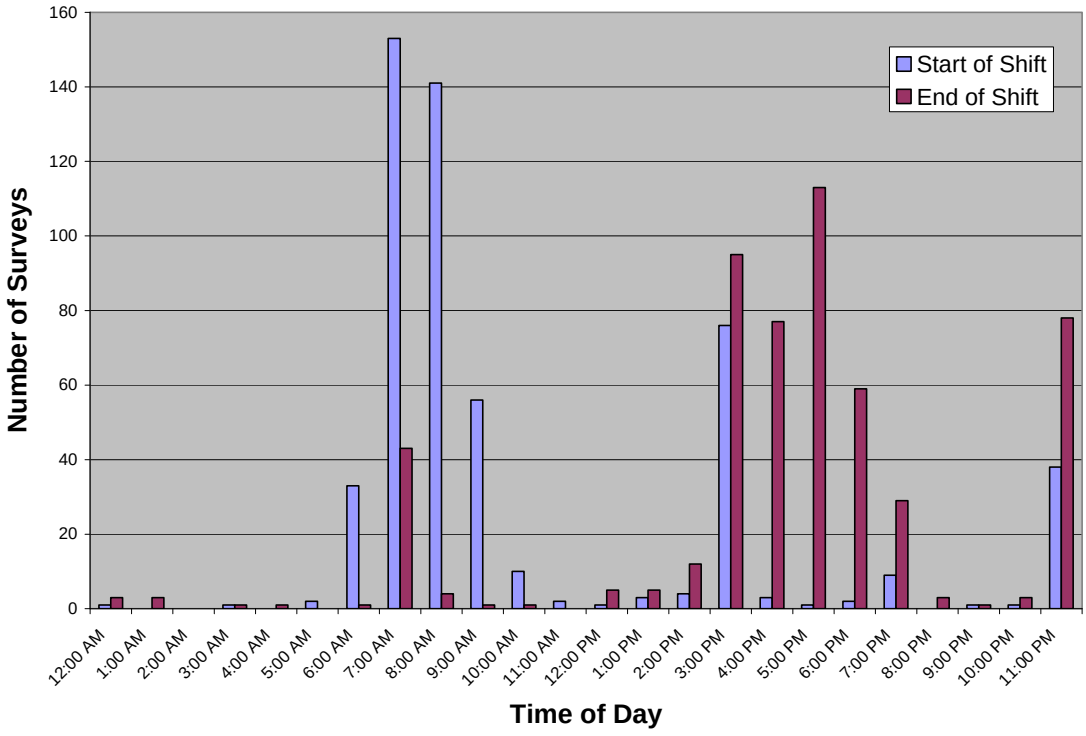
Question 3: Did you take any days off during the week of December 2, 2007?

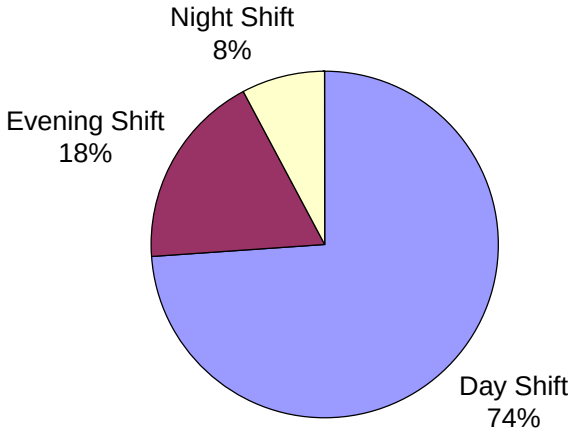


About 57 percent of survey respondents reported they took no days off, 30 percent took a normal day off, and two percent reported to another work site during the week of December 2, 2007.

Question 4: What time did you start and end work each day?



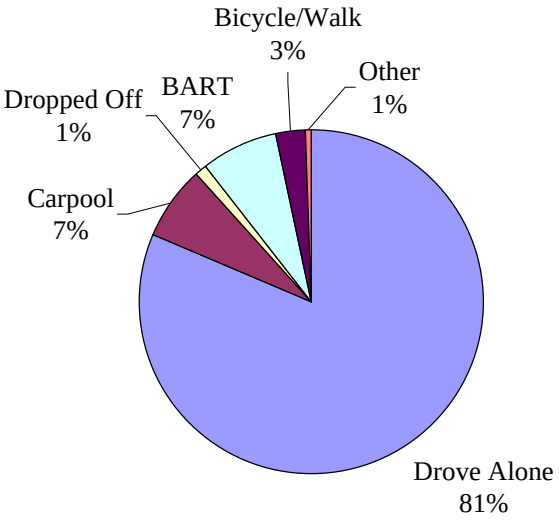
About 71 percent of survey respondents started work between 6:00 and 10:00 AM. About 14 percent started work between 3:00 and 4:00 PM and about 7 percent started work between 11:00 PM and midnight. Similarly, about 70 percent ended work between 3:00 and 8:00 PM, 14 percent between 11 PM and midnight, and 8 percent between 7:00 and 8:00 AM.



Overall, about 74 percent of employees work during the day shift, 18 percent during the evening shift, and 8 percent during the night shift.

About 24 percent of day shift employees, two percent of evening shift employees, and none of night shift employees worked primarily at the Outpatient Center.

Question 5: How did you travel to and from work?

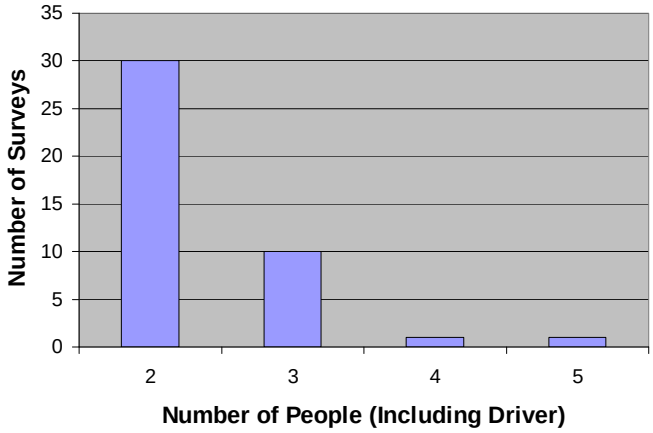


Among survey respondents who specified a travel mode to work, 82 percent drove alone, seven percent carpooled, seven percent used BART, and two percent bicycled or walked.

The mode split for each shift is shown in the table below. About 81 percent of day-shift employees drove alone, compared with 84 percent of evening shift employees and 93 percent of night shift employees.

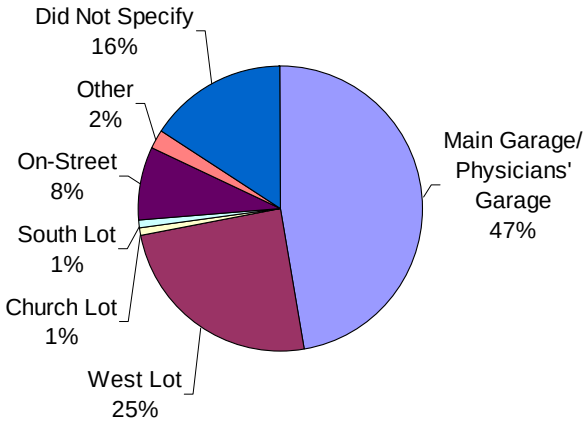
Mode	***Day Shift***	***Evening Shift***	***Night Shift***	***Overall***
Drive Alone	80%	85%	91%	82%
Carpool	7%	9%	3%	7%
BART	8%	3%	3%	7%
Dropped Off	1%	1%	3%	1%
AC Transit Bus	0%	1%	0%	0%
Bike/Walk	3%	1%	0%	3%
Motorcycle	1%	0%	0%	0%
Total	***100%***	***100%***	***100%***	***100%***

Question 6: If you drove in a carpool, how many people were in the vehicle?



About 70 percent of carpools consisted of two people, about 25 percent consisted of three people and the remaining five percent consisted of four or more people. The average vehicle occupancy for carpools, including the driver, is 2.4 persons per vehicle.

Question 7: If you drove alone or were a passenger in a carpool, where did the driver park?



About 47 percent of drivers parked in the main garage, 25 percent parked in the West Lot, one percent parked in the Church Lot, eight percent parked on the street, one percent parked in the South Lot, three percent parked in other facilities and 16 percent of the employees who drove alone or were a passenger in a carpool did not specify where they parked.

About 83 percent of day shift employees who specified a parking location parked in the facilities operated by Children's Hospital (i.e., Main Garage, West Lot, Church Lot, and South Lot); 95 percent of evening shift and 97 percent of night shift employees used these facilities.

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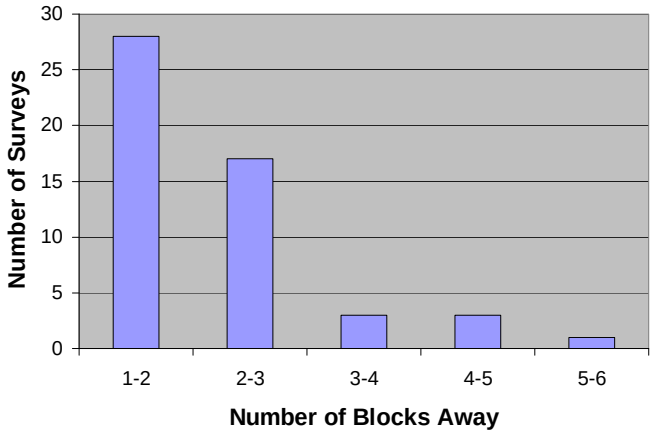
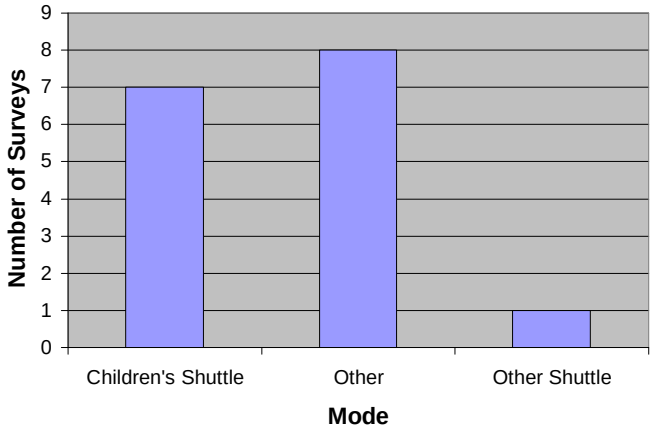
Question 8: If you parked on the street, how many blocks from Children's Hospital did you park?



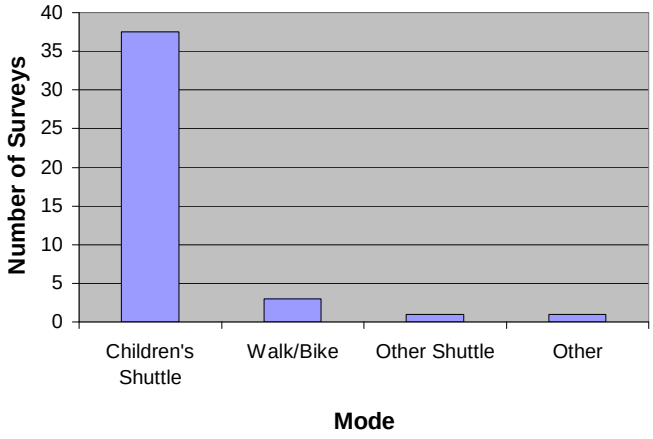
Over half the survey respondents who parked on street parked within two blocks of the hospital. About a third parked between 2 and 3 blocks away, and a little more than 10 percent parked more than 3 blocks away.

Question 9: If you parked beyond walking distance to Children's Hospital, how did you reach the hospital?



Of the 17 survey respondents who indicated they parked beyond walking distance to Children's Hospital, 6 used the Children's Hospital Shuttle, and 1 use another shuttle. Of the 10 who stated they used another mode, one specified "taxi" and one specified "car," but the other 8 did not specify how they reached the hospital.

Question 10: If you used BART, how did you reach the hospital from the BART station?



About 88 percent of BART users traveled between the hospital and the MacArthur BART Station using the Children's Hospital Shuttle. Others either walked or biked, used other shuttles, or other travel modes.

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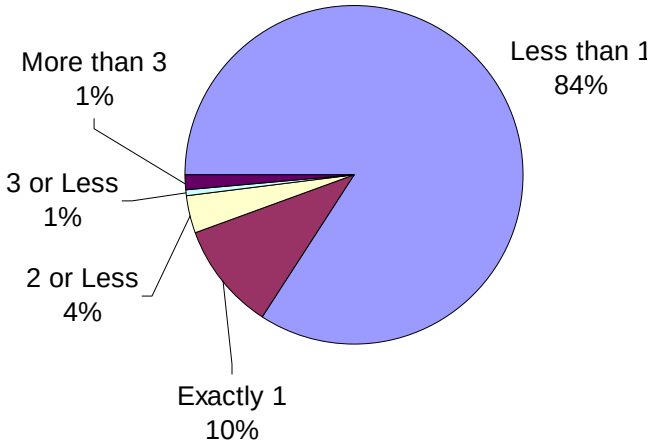
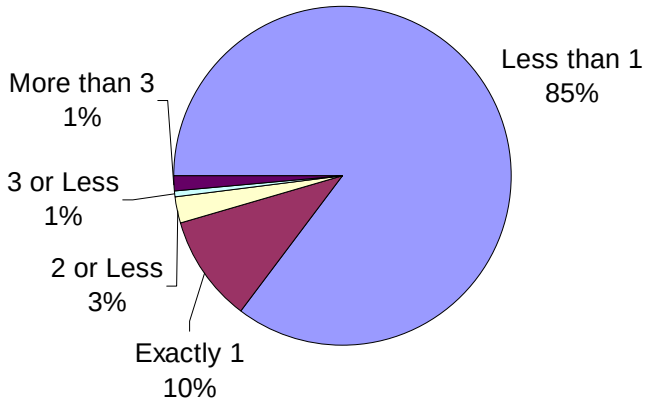
11. Please indicate the number of times each day you travel off-campus by car during the course of your shift.



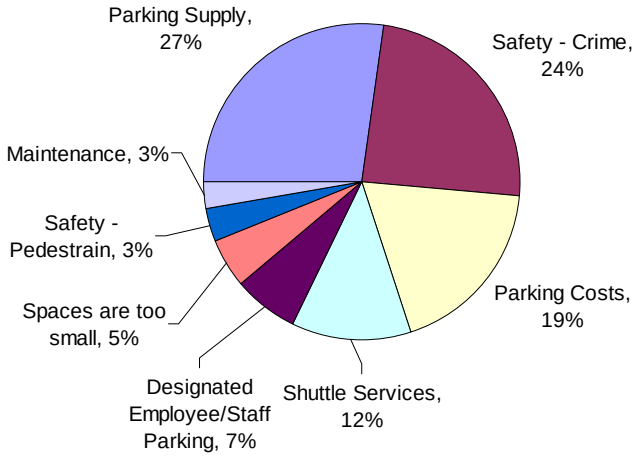
About 84 percent of survey respondents travel off-campus less than one time per day by car. About 12 percent travel off-campus between one and two times a day by car, and 4 percent travel off-campus two or more times a day by car. This corresponds to about 0.26 round trips off-campus per employee, or 0.52 one-way trips.

Question 12: Please indicate the number of times each day you travel off-campus by walking or shuttle during the course of your shift.



About 85 percent of survey respondents travel off-campus less than once per day by walking or shuttle. About 11 percent travel off-campus between 1 and 2 times a day, and four percent travel off-campus twice or more times a day by walking or shuttle. This corresponds to an average of 0.24 round trips off-campus per employee, or 0.48 trips accounting for trips both to and from the hospital.

Question 13: Comments



In addition to the specific questions included in the survey, the employees were asked to provide comments related to transportation and parking. This chart includes comments from all surveyed employees, not just those who work at the main campus. The most common issue in the employee comments was the need for additional parking supply, followed by concerns about crime, parking costs, shuttle services, the desire for designated staff parking, garage parking space size, pedestrian safety, and maintenance.

CHILDREN'S HOSPITAL & RESEARCH CENTER OAKLAND

Children's Hospital Oakland Staff Transportation Survey

Department:_____ Home city_____ Home zip code:_____

Please answer the following questions, describing your typical work schedule and means of travel to **work for the week of December 2, 2007. Please write the number of the correct answer in the box next to each question.** For example, if your primary work location during the week is the main Children's Hospital building, answer the first question as: [1]

1. What is your primary work location?
- Main Hospital Building 1
- Outpatient Center 2
- Other (specify) 3

2. What type of schedule do you work?
- Full-time 1
- Part-time 2
- On-call 3
- Volunteer 4
- Other 9
  - Specify:_____

3. If you did not work at Children's Hospital Oakland on any day(s) during the week of Dec. 2, 2007, please indicate the reason.
- Normal day off *(weekend, compressed week)* .. 1
- Reported to another work site 2
- Reported at home/telecommuted 3
- Other (sick, vacation, jury duty) 4

4. What time did you start and end work each day? Please enter time and circle a.m. or p.m.

Start: a.m. / p.m.

End: a.m. / p.m.

5. How did you travel to and from work?
(If you used more than one mode of transportation each way, choose the number that accounts for the greatest distance of your trip.)

To work: a.m. / p.m.

From work: a.m. / p.m.

- Drove alone: 1
- Drove in carpool/vanpool: 2
- Passenger in car/vanpool: 3
- AC Transit bus: 4
- BART: 5
- Motorcycle/moped: 6
- Bicycle: 7
- Walk 8
- Dropped off: 9
- Taxi 10
- Other 11
  - Specify:_____

6. If you drove or rode in a carpool or vanpool, how many people (including the driver) were in the vehicle?

7. If you drove alone or were a passenger in a carpool or vanpool, where did you park?

8. If you parked on the street, how many blocks from Children's Hospital did you park?

9. If you parked beyond walking distance to Children's Hospital (either on-street or off-street), how did you reach the hospital?
- Children's Hospital Shuttle 1
- Other shuttle 2
- Other 4
  - Specify:_____

10. If you used BART, how did you reach the hospital from the BART station?
- Children's Hospital Shuttle 1
- Other shuttle 2
- AC Transit 3
- Walk/Bicycle 4
- Other 5
  - Specify:_____

11. Please indicate the number of times each day you travel off-campus by car during the course of your shift *(i.e., lunch, errands, business, or other Children's Hospital buildings).*

12. Please indicate the number of times each day you travel off-campus by walking or shuttle during the course of your shift *(i.e., lunch, errands, business, or other Children's Hospital buildings).*

Comments concerning transportation and parking related to Children's:_____

_____

Appendix C - Survey Result Validation

Total Staff =	2,166		
% on-site on typical day =	90%		
Staff Survey Results	Day	Evening	Night
% Staff by Shift	74%	18%	8%
Drive Alone Mode Share	80%	85%	91%
Carpool Mode Share	7%	9%	3%
Dropped off Mode Share	1%	1%	3%
Trips per Staff per Day	2.5	2.5	2.5
Passengers per Carpool	2.4	2.4	2.4
Auto Trips per Day			
Drive Alone Mode Share	2,885	746	355
Carpool	84	26	4
Dropped off	58	14	19
Total	3,027	786	377
Total Estimated Staff Daily Trip Generation =	**4,190**		

Total Patients/Visitors =	1,456
Patient/Visitor Survey Results	
	All
Drive Alone Mode Share	21%
Carpool Mode Share	60%
Dropped off Mode Share	6%
Trips per Patient/Visitor per Day	2.5
Passengers per Carpool	2.7
Auto Trips per Day	
Drive Alone Mode Share	764
Carpool	647
Dropped off	349
Total Estimated Patient/Visitor Daily Trip Generation =	**1,761**

Total Estimated Daily Trip Generation =	**5,951**
Total Observed Trip Generation =	**5,690**
% Difference =	4.6%

Appendix D - CHRCO Trip Generation by Hour and Parking Facility

	Main Garage			Physicians Garage			West Lot			South Lot			Main Plaza			Other/On-Street			Total		
Hour Start	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
12:30 AM	3	9	12	0	3	3	1	4	5	0	3	3	5	7	12	2	4	6	11	30	41
1:30 AM	2	7	9	1	2	3	0	1	1	1	2	3	5	4	9	1	2	3	10	18	28
2:30 AM	3	3	6	0	1	1	0	1	1	0	0	0	0	2	2	1	1	2	4	8	12
3:30 AM	3	4	7	0	1	1	1	2	3	0	0	0	8	7	15	2	2	4	14	16	30
4:30 AM	8	2	10	1	1	2	2	0	2	1	1	2	5	5	10	3	1	4	20	10	30
5:30 AM	45	6	51	6	1	7	27	0	27	1	4	5	8	7	15	15	3	18	102	21	123
6:30 AM	168	22	190	17	9	26	41	2	43	6	3	9	16	19	35	38	6	44	286	61	347
7:30 AM	**146**	**71**	**217**	**30**	**27**	**57**	**42**	**6**	**48**	**14**	**3**	**17**	**26**	**24**	**50**	**40**	**16**	**56**	**298**	**147**	**445**
8:30 AM	167	37	204	42	12	54	25	2	27	8	5	13	23	31	54	43	11	54	308	98	406
9:30 AM	85	49	134	34	11	45	8	0	8	10	4	14	28	28	56	34	15	49	199	107	306
10:30 AM	90	75	165	14	10	24	18	2	20	10	4	14	26	28	54	35	23	58	193	142	335
11:30 AM	76	97	173	9	12	21	7	2	9	8	9	17	29	29	58	27	30	57	156	179	335
12:30 PM	99	86	185	10	6	16	2	4	6	11	8	19	41	40	81	31	30	61	194	174	368
1:30 PM	106	80	186	10	6	16	17	5	22	6	9	15	29	28	57	35	27	62	203	155	358
2:30 PM	82	120	202	7	18	25	28	22	50	7	5	12	37	37	74	30	38	68	191	240	431
3:30 PM	47	179	226	3	28	31	4	58	62	9	12	21	23	31	54	17	57	74	103	365	468
4:30 PM	**51**	**177**	**228**	**5**	**26**	**31**	**2**	**48**	**50**	**8**	**17**	**25**	**28**	**31**	**59**	**20**	**56**	**76**	**114**	**355**	**469**
5:30 PM	28	118	146	5	14	19	1	14	15	6	6	12	19	25	44	10	36	46	69	213	282
6:30 PM	50	52	102	3	9	12	2	11	13	7	9	16	21	23	44	17	18	35	100	122	222
7:30 PM	14	62	76	1	7	8	2	11	13	2	5	7	14	15	29	7	17	24	40	117	157
8:30 PM	16	26	42	2	3	5	4	5	9	2	6	8	13	14	27	6	9	15	43	63	106
9:30 PM	13	25	38	3	5	8	2	3	5	3	4	7	10	8	18	5	8	13	36	53	89
10:30 PM	50	22	72	18	6	24	4	8	12	0	1	1	14	14	28	12	9	21	98	60	158
11:30 PM	5	40	45	1	9	10	3	35	38	1	3	4	9	13	22	3	15	18	22	115	137
Total	**1,357**	**1,369**	**2,726**	**222**	**227**	**449**	**243**	**246**	**489**	**121**	**123**	**244**	**437**	**470**	**907**	**434**	**434**	**868**	**2,814**	**2,869**	**5,683**

Garage data based on data collected on September 18, 2013

Appendix F

LOS Calculation Worksheets – Existing Plus Phase 1 Conditions

FEHR PEERS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	13	170	219	54	217	57	14	127	1341	59	52	1241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.93			0.98			1.00	0.99		1.00	1.00
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1707			1759			1770	5039		1770	5064
Flt Permitted		0.98			0.77			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1683			1364			1770	5039		1770	5064
Peak-hour factor, PHF	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. Flow (vph)	13	170	219	54	217	57	14	127	1341	59	52	1241
RTOR Reduction (vph)	0	56	0	0	10	0	0	0	4	0	0	2
Lane Group Flow (vph)	0	346	0	0	318	0	0	141	1396	0	52	1266
Confl. Peds. (#/hr)	7		14	14		7				21		
Confl. Bikes (#/hr)			16			15				6		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		25.9			25.9			15.3	45.1		4.5	34.3
Effective Green, g (s)		25.9			25.9			15.3	45.1		4.5	34.3
Actuated g/C Ratio		0.29			0.29			0.17	0.50		0.05	0.38
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		484			392			300	2525		88	1929
v/s Ratio Prot								0.08	c0.28		0.03	c0.25
v/s Ratio Perm		0.21			c0.23							
v/c Ratio		0.72			0.81			0.47	0.55		0.59	0.66
Uniform Delay, d1		28.7			29.8			33.7	15.5		41.8	23.0
Progression Factor		1.00			1.00			0.52	0.14		1.00	1.00
Incremental Delay, d2		5.0			12.0			1.1	0.8		10.2	1.8
Delay (s)		33.7			41.8			18.7	2.9		52.0	24.7
Level of Service		C			D			B	A		D	C
Approach Delay (s)		33.7			41.8				4.4			25.8
Approach LOS		C			D				A			C

Intersection Summary			
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: MLK Way & 55th Street

Children's Hospital
Existing AM Plus Phase 1

Movement	SBR
Lane Configurations	
Volume (vph)	27
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	27
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	12
Confl. Bikes (#/hr)	7
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis
2: Dover Street & 55th Street

Children's Hospital
Existing AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	259	6	20	296	6	7	8	11	8	6	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	18	259	6	20	296	6	7	8	11	8	6	21
Pedestrians		9			20			15			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked	0.91						0.91	0.91		0.91	0.91	0.91
vC, conflicting volume	308			280			685	661	297	678	661	314
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	185			280			601	575	297	593	575	192
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			98	98	98	98	98	97
cM capacity (veh/h)	1237			1255			341	373	726	344	369	758

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	283	322	26	35
Volume Left	18	20	7	8
Volume Right	6	6	11	21
cSH	1237	1255	455	521
Volume to Capacity	0.01	0.02	0.06	0.07
Queue Length 95th (ft)	1	1	5	5
Control Delay (s)	0.6	0.6	13.4	12.4
Lane LOS	A	A	B	B
Approach Delay (s)	0.6	0.6	13.4	12.4
Approach LOS			B	B

Intersection Summary				
Average Delay			1.8	
Intersection Capacity Utilization			36.7%	ICU Level of Service
Analysis Period (min)			15	

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
Existing AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	197	40	25	250	31	28	430	24	25	544	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.99			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.99			0.99			0.99	
Flt Protected		0.99			1.00			1.00			1.00	
Satd. Flow (prot)		1742			1803			1841			1861	
Flt Permitted		0.90			0.96			0.95			0.97	
Satd. Flow (perm)		1580			1743			1759			1813	
Peak-hour factor, PHF	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. Flow (vph)	50	197	40	25	250	31	28	430	24	25	544	28
RTOR Reduction (vph)	0	8	0	0	5	0	0	2	0	0	2	0
Lane Group Flow (vph)	0	279	0	0	301	0	0	480	0	0	595	0
Confl. Peds. (#/hr)	6		13	13		6	7		17	17		7
Confl. Bikes (#/hr)			22			10			13			24
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		25.0			25.0			47.0			47.0	
Effective Green, g (s)		25.0			25.0			47.0			47.0	
Actuated g/C Ratio		0.31			0.31			0.59			0.59	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		493			544			1033			1065	
v/s Ratio Prot												
v/s Ratio Perm		c0.18			0.17			0.27			c0.33	
v/c Ratio		0.57			0.55			0.46			0.56	
Uniform Delay, d1		23.0			22.9			9.4			10.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		4.7			4.0			1.5			2.1	
Delay (s)		27.6			26.9			10.9			12.2	
Level of Service		C			C			B			B	
Approach Delay (s)		27.6			26.9			10.9			12.2	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM 2000 Control Delay		17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio		0.56		
Actuated Cycle Length (s)		80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization		73.8%	ICU Level of Service	D
Analysis Period (min)		15		
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
Existing AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	146	14	77	32	10	9	58	707	40	27	810	236
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		0.99	1.00	
Frt		0.96			0.98		1.00	0.99		1.00	0.97	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1654			1713		1761	3496		1768	3406	
Flt Permitted		0.78			0.79		0.23	1.00		0.35	1.00	
Satd. Flow (perm)		1333			1404		429	3496		643	3406	
Peak-hour factor, PHF	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. Flow (vph)	146	14	77	32	10	9	58	707	40	27	810	236
RTOR Reduction (vph)	0	30	0	0	7	0	0	4	0	0	29	0
Lane Group Flow (vph)	0	207	0	0	44	0	58	743	0	27	1017	0
Confl. Peds. (#/hr)	6		11	11		6	13		17	17		13
Confl. Bikes (#/hr)			15			15			43			27
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		16.7			16.7		44.3	44.3		44.3	44.3	
Effective Green, g (s)		16.7			16.7		44.3	44.3		44.3	44.3	
Actuated g/C Ratio		0.24			0.24		0.63	0.63		0.63	0.63	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		318			334		271	2212		406	2155	
v/s Ratio Prot								0.21			c0.30	
v/s Ratio Perm		c0.16			0.03		0.14			0.04		
v/c Ratio		0.65			0.13		0.21	0.34		0.07	0.47	
Uniform Delay, d1		24.0			21.0		5.5	6.0		4.9	6.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.7			0.2		1.8	0.4		0.3	0.7	
Delay (s)		28.8			21.1		7.3	6.4		5.2	7.5	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		28.8			21.1			6.5			7.4	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	62.0%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
5: MLK Way & 54th Street

Children's Hospital
Existing AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	4	3	43	5	3	8	10	15	1517	10	5	1488
Sign Control		Stop			Stop				Free			Free
Grade		0%			0%				0%			0%
Peak Hour 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
Hourly flow rate (vph)	4	3	43	5	3	8	0	15	1517	10	5	1488
Pedestrians		7			6				8			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		1			1				1			
Right turn flare (veh)												
Median type									None			None
Median storage veh)												
Upstream signal (ft)									299			294
pX, platoon unblocked	0.87	0.87	0.80	0.87	0.87	0.86	0.00	0.80			0.86	
vC, conflicting volume	2054	3072	514	2116	3070	517	0	1502			1533	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	586	1756	0	658	1754	0	0	749			1041	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	*5.0	*5.0	*5.0	0.0	2.2			2.2	
p0 queue free %	99	96	95	98	96	99	0	98			99	
cM capacity (veh/h)	318	72	861	214	68	615	0	680			572	

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	50	16	394	758	389	377	744	379
Volume Left	4	5	15	0	0	5	0	0
Volume Right	43	8	0	0	10	0	0	7
cSH	479	198	680	1700	1700	572	1700	1700
Volume to Capacity	0.10	0.08	0.02	0.45	0.23	0.01	0.44	0.22
Queue Length 95th (ft)	9	7	2	0	0	1	0	0
Control Delay (s)	13.4	24.8	0.7	0.0	0.0	0.3	0.0	0.0
Lane LOS	B	C	A			A		
Approach Delay (s)	13.4	24.8	0.2			0.1		
Approach LOS	B	C						

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	59.9%	ICU Level of Service	B	
Analysis Period (min)	15			

* User Entered Value

Movement	SBR
Lane Configurations	
Volume (veh/h)	7
Sign Control	
Grade	
Peak Hour Factor	1.00
Hourly flow rate (vph)	7
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	
tC, single (s)	
tC, 2 stage (s)	
tF (s)	
p0 queue free %	
cM capacity (veh/h)	

Direction, Lane #	

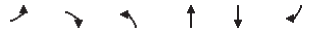
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	5	6	4	6	9	8	17	11	4	33	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	5	6	4	6	9	8	17	11	4	33	5
Pedestrians		10			14			2			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	110	112	48	106	108	42	48			42		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	110	112	48	106	108	42	48			42		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	99	100	99	99	99			100		
cM capacity (veh/h)	831	761	1017	839	764	1017	1559			1562		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	16	19	36	42
Volume Left	5	4	8	4
Volume Right	6	9	11	5
cSH	865	885	1559	1562
Volume to Capacity	0.02	0.02	0.01	0.00
Queue Length 95th (ft)	1	2	0	0
Control Delay (s)	9.2	9.2	1.7	0.7
Lane LOS	A	A	A	A
Approach Delay (s)	9.2	9.2	1.7	0.7
Approach LOS	A	A		

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	19.4%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
7: Shattuck Ave & 54th Street

Children's Hospital
Existing AM Plus Phase 1



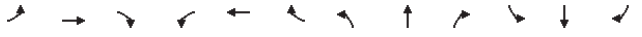
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	14	12	487	587	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	14	12	487	587	5
Pedestrians	9			2	1	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.81	0.81	0.81			
vC, conflicting volume	1110	600	601			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1005	386	387			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	99			
cM capacity (veh/h)	214	533	939			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	15	499	592
Volume Left	1	12	0
Volume Right	14	0	5
cSH	485	939	1700
Volume to Capacity	0.03	0.01	0.35
Queue Length 95th (ft)	2	1	0
Control Delay (s)	12.7	0.4	0.0
Lane LOS	B	A	
Approach Delay (s)	12.7	0.4	0.0
Approach LOS	B		

Intersection Summary				
Average Delay		0.3		
Intersection Capacity Utilization		45.9%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
8: MLK Way & 53rd Street

Children's Hospital
Existing AM Plus Phase 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	4	34	13	4	12	21	1546	30	11	1549	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.98			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.89			0.94		1.00	1.00		1.00	1.00	
Flt Protected		1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1623			1736		1770	5065		1787	5132	
Flt Permitted		0.98			0.89		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1598			1574		1770	5065		1787	5132	
Peak-hour factor, PHF	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. Flow (vph)	4	4	34	13	4	12	21	1546	30	11	1549	5
RTOR Reduction (vph)	0	29	0	0	10	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	13	0	0	19	0	21	1575	0	11	1554	0
Confl. Peds. (#/hr)	7		13	13		7			13			20
Confl. Bikes (#/hr)									5			13
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		14.5			14.5		3.0	61.2		1.8	60.0	
Effective Green, g (s)		14.5			14.5		3.0	61.2		1.8	60.0	
Actuated g/C Ratio		0.16			0.16		0.03	0.68		0.02	0.67	
Clearance Time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		257			253		59	3444		35	3421	
v/s Ratio Prot							0.01	c0.31		0.01	c0.30	
v/s Ratio Perm		0.01			c0.01							
v/c Ratio		0.05			0.07		0.36	0.46		0.31	0.45	
Uniform Delay, d1		31.9			32.1		42.6	6.7		43.5	7.2	
Progression Factor		1.00			1.01		1.17	0.49		0.51	0.22	
Incremental Delay, d2		0.1			0.1		3.1	0.4		4.2	0.4	
Delay (s)		32.0			32.6		53.0	3.7		26.5	2.0	
Level of Service		C			C		D	A		C	A	
Approach Delay (s)		32.0			32.6			4.3			2.1	
Approach LOS		C			C			A			A	

Intersection Summary					
HCM 2000 Control Delay		3.9	HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio		0.40			
Actuated Cycle Length (s)		90.0	Sum of lost time (s)		12.5
Intersection Capacity Utilization		52.5%	ICU Level of Service		A
Analysis Period (min)		15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
9: Dover Street & 53rd Street

Children's Hospital
Existing AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	11	2	24	3	3	6	13	21	11	2	26	18
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	11	2	24	3	3	6	13	21	11	2	26	18
Pedestrians		22			21			2			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			2			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	123	140	59	140	144	50	66			53		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	123	140	59	140	144	50	66			53		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	98	100	100	99	99			100		
cM capacity (veh/h)	803	721	992	770	718	1005	1520			1538		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	37	12	45	46
Volume Left	11	3	13	2
Volume Right	24	6	11	18
cSH	910	854	1520	1538
Volume to Capacity	0.04	0.01	0.01	0.00
Queue Length 95th (ft)	3	1	1	0
Control Delay (s)	9.1	9.3	2.2	0.3
Lane LOS	A	A	A	A
Approach Delay (s)	9.1	9.3	2.2	0.3
Approach LOS	A	A		

Intersection Summary				
Average Delay			4.0	
Intersection Capacity Utilization			21.4%	ICU Level of Service
Analysis Period (min)			15	

HCM Signalized Intersection Capacity Analysis
10: MLK Way & 52nd Street

Children's Hospital
Existing AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	38	77	100	65	80	235	50	56	1475	53	25	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.97			1.00	0.98		1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00			0.99	1.00		1.00	1.00			1.00
Frt	1.00	0.92			1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00			0.98	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1775	1665			1796	1544		1787	5105			1787
Flt Permitted	0.64	1.00			0.77	1.00		0.95	1.00			0.95
Satd. Flow (perm)	1189	1665			1423	1544		1787	5105			1787
Peak-hour factor, PHF	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. Flow (vph)	38	77	100	65	80	235	50	56	1475	53	25	84
RTOR Reduction (vph)	0	60	0	0	0	177	0	0	4	0	0	0
Lane Group Flow (vph)	38	117	0	0	145	58	0	106	1524	0	0	109
Confl. Peds. (#/hr)	10		49	49		10				7		
Confl. Bikes (#/hr)			6			5				1		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	22.2	22.2			22.2	22.2		7.2	44.3			10.0
Effective Green, g (s)	22.2	22.2			22.2	22.2		7.2	44.3			10.0
Actuated g/C Ratio	0.25	0.25			0.25	0.25		0.08	0.49			0.11
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	293	410			351	380		142	2512			198
v/s Ratio Prot		0.07						0.06	c0.30			0.06
v/s Ratio Perm	0.03				c0.10	0.04						
v/c Ratio	0.13	0.29			0.41	0.15		0.75	0.61			0.55
Uniform Delay, d1	26.4	27.5			28.4	26.5		40.5	16.5			37.9
Progression Factor	1.00	1.00			1.00	1.00		0.99	1.05			0.77
Incremental Delay, d2	0.1	0.1			0.3	0.1		8.6	0.5			1.7
Delay (s)	26.5	27.6			28.7	26.6		48.9	18.0			30.8
Level of Service	C	C			C	C		D	B			C
Approach Delay (s)		27.4			27.4				20.0			
Approach LOS		C			C				B			

Intersection Summary				
HCM 2000 Control Delay		18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio		0.56		
Actuated Cycle Length (s)		90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization		92.9%	ICU Level of Service	F
Analysis Period (min)		15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1477	0
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5136	
Flt Permitted	1.00	
Satd. Flow (perm)	5136	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1477	0
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1477	0
Confl. Peds. (#/hr)		10
Confl. Bikes (#/hr)		10
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	46.6	
Effective Green, g (s)	46.6	
Actuated g/C Ratio	0.52	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2659	
v/s Ratio Prot	c0.29	
v/s Ratio Perm		
v/c Ratio	0.56	
Uniform Delay, d1	14.7	
Progression Factor	0.75	
Incremental Delay, d2	0.8	
Delay (s)	11.8	
Level of Service	B	
Approach Delay (s)	13.1	
Approach LOS	B	

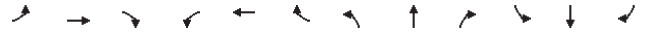
Intersection Summary			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	202	8	6	352	2	15	7	10	0	2	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.96			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			1.00			0.96			0.88	
Flt Protected		1.00			1.00			0.98			1.00	
Satd. Flow (prot)		3499			3598			1465			1655	
Flt Permitted		0.95			0.95			0.94			1.00	
Satd. Flow (perm)		3341			3425			1404			1655	
Peak-hour factor, PHF	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. Flow (vph)	4	202	8	6	352	2	15	7	10	0	2	15
RTOR Reduction (vph)	0	5	0	0	1	0	0	5	0	0	8	0
Lane Group Flow (vph)	0	209	0	0	359	0	0	27	0	0	9	0
Confl. Peds. (#/hr)	17		55	55		17			202	202		
Confl. Bikes (#/hr)			6			5						1
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Prot	NA		Perm	NA		Perm	NA			NA	
Protected Phases	5	2			6			4			8	
Permitted Phases				6			4			8		
Actuated Green, G (s)		21.0			14.0			23.0			23.0	
Effective Green, g (s)		21.0			14.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.28			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1415			959			645			761	
v/s Ratio Prot		c0.01									0.01	
v/s Ratio Perm		0.05			c0.10			c0.02				
v/c Ratio		0.15			0.37			0.04			0.01	
Uniform Delay, d1		9.0			14.5			7.4			7.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			1.1			0.1			0.0	
Delay (s)		9.2			15.6			7.6			7.4	
Level of Service		A			B			A			A	
Approach Delay (s)		9.2			15.6			7.6			7.4	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.17		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	39.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
12: 52nd Street & Dover Street

Children's Hospital
Existing AM Plus Phase 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	189	1	11	329	27	3	0	7	35	3	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	19	189	1	11	329	27	3	0	7	35	3	25
Pedestrians		20			10			12			23	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			1			1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.91			0.95			0.93	0.93	0.95	0.93	0.93	0.91
vC, conflicting volume	379			202			650	640	212	632	628	386
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	266			132			467	456	142	447	442	273
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	98			99			99	100	99	92	99	96
cM capacity (veh/h)	1151			1371			412	433	824	454	454	675

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	209	367	10	63
Volume Left	19	11	3	35
Volume Right	1	27	7	25
cSH	1151	1371	634	522
Volume to Capacity	0.02	0.01	0.02	0.12
Queue Length 95th (ft)	1	1	1	10
Control Delay (s)	0.9	0.3	10.8	12.8
Lane LOS	A	A	B	B
Approach Delay (s)	0.9	0.3	10.8	12.8
Approach LOS			B	B

Intersection Summary					
Average Delay	1.9				
Intersection Capacity Utilization	38.5%	ICU Level of Service		A	
Analysis Period (min)	15				

HCM Unsignalized Intersection Capacity Analysis
13: SR-24 NB Off-Ramp & 52nd Street

Children's Hospital
Existing AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	223	0	0	371	1076	0	898	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	223	0	0	371	1076	0	898	0	0
Pedestrians							24			
Lane Width (ft)							12.0			
Walking Speed (ft/s)							4.0			
Percent Blockage							2			
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.83						0.83		0.83	0.83
vC, conflicting volume	1447			247			1694	136	1380	618
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1132			247			1429	136	1052	135
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	510			1290			109	867	0	615

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	112	112	247	482	717	449	449
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	359	717	449	449
cSH	1700	1700	1700	1700	1700	867	867
Volume to Capacity	0.07	0.07	0.15	0.28	0.42	0.52	0.52
Queue Length 95th (ft)	0	0	0	0	0	76	76
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	13.5	13.5
Lane LOS						B	B
Approach Delay (s)	0.0		0.0			13.5	
Approach LOS						B	

Intersection Summary					
Average Delay	4.7				
Intersection Capacity Utilization	48.2%	ICU Level of Service		A	
Analysis Period (min)	15				

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	40	285	683	148	24	871	82	154	123	30	96	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.99		1.00	1.00		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.97		1.00	0.99		1.00	0.97			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.98
Satd. Flow (prot)		1787	4944		1805	5105		1752	1781			1734
Flt Permitted		0.95	1.00		0.95	1.00		0.44	1.00			0.80
Satd. Flow (perm)		1787	4944		1805	5105		809	1781			1410
Peak-hour factor, PHF	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. Flow (vph)	40	285	683	148	24	871	82	154	123	30	96	136
RTOR Reduction (vph)	0	0	31	0	0	12	0	0	10	0	0	0
Lane Group Flow (vph)	0	325	800	0	24	941	0	154	143	0	0	232
Confl. Peds. (#/hr)				12			5			10	10	
Confl. Bikes (#/hr)				12			1			10		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		21.5	37.7		3.2	19.4		35.1	35.1			24.6
Effective Green, g (s)		21.5	37.7		3.2	19.4		35.1	35.1			24.6
Actuated g/C Ratio		0.24	0.42		0.04	0.22		0.39	0.39			0.27
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		426	2070		64	1100		383	694			385
v/s Ratio Prot		c0.18	0.16		0.01	c0.18		c0.03	0.08			
v/s Ratio Perm								0.13				c0.16
v/c Ratio		0.76	0.39		0.38	0.86		0.40	0.21			0.60
Uniform Delay, d1		31.9	18.1		42.4	34.0		18.8	18.2			28.4
Progression Factor		1.00	1.00		1.22	0.83		1.00	1.00			1.00
Incremental Delay, d2		12.2	0.5		3.0	7.2		0.7	0.7			6.8
Delay (s)		44.1	18.7		54.7	35.5		19.5	18.9			35.3
Level of Service		D	B		D	D		B	B			D
Approach Delay (s)			25.8			36.0			19.2			30.3
Approach LOS			C			D			B			C

Intersection Summary			
HCM 2000 Control Delay	29.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	100.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: 52nd Street & Shattuck Ave

Children's Hospital
Existing AM Plus Phase 1

Movement	SBR
Lane Configurations	
Volume (vph)	376
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.94
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1419
Flt Permitted	1.00
Satd. Flow (perm)	1419
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	376
RTOR Reduction (vph)	273
Lane Group Flow (vph)	103
Confl. Peds. (#/hr)	16
Confl. Bikes (#/hr)	41
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	24.6
Effective Green, g (s)	24.6
Actuated g/C Ratio	0.27
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	387
v/s Ratio Prot	
v/s Ratio Perm	0.07
v/c Ratio	0.27
Uniform Delay, d1	25.6
Progression Factor	1.00
Incremental Delay, d2	1.7
Delay (s)	27.3
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
15: Telegraph Ave & 52nd Street/Claremont Ave

Children's Hospital
Existing AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	0	6	94	52	154	0	657	117	64	598	273
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.98		1.00	0.99			0.99		1.00	0.97	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.93		1.00	0.89			0.98		1.00	0.95	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1576		1698	1569			3852		1770	3280	
Flt Permitted		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (perm)		1576		1698	1569			3852		1770	3280	
Peak-hour factor, PHF	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. Flow (vph)	6	0	6	94	52	154	0	657	117	64	598	273
RTOR Reduction (vph)	0	12	0	0	119	0	0	11	0	0	37	0
Lane Group Flow (vph)	0	0	0	85	96	0	0	763	0	64	834	0
Confl. Peds. (#/hr)	4					4	22		18			22
Confl. Bikes (#/hr)			1			2			33			27
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA			NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		1.1		15.4	15.4			48.2		7.3	60.0	
Effective Green, g (s)		1.1		15.4	15.4			48.2		7.3	60.0	
Actuated g/C Ratio		0.01		0.17	0.17			0.54		0.08	0.67	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		19		290	268			2062		143	2186	
v/s Ratio Prot		c0.00		0.05	c0.06			0.20		0.04	c0.25	
v/s Ratio Perm												
v/c Ratio		0.01		0.29	0.36			0.37		0.45	0.38	
Uniform Delay, d1		43.9		32.6	32.9			12.1		39.4	6.7	
Progression Factor		1.00		1.00	1.00			0.95		1.00	1.00	
Incremental Delay, d2		0.1		0.6	0.8			0.4		2.2	0.5	
Delay (s)		44.0		33.1	33.8			11.9		41.7	7.2	
Level of Service		D		C	C			B		D	A	
Approach Delay (s)		44.0			33.6			11.9			9.6	
Approach LOS		D			C			B			A	

Intersection Summary				
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.39			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	70.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
16: Telegraph Ave & 51St Street

Children's Hospital
Existing AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	220	488	68	101	530	238	91	320	58	147	511	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.98		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3417		1787	3349		1719	3324		1752	3447	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3417		1787	3349		1719	3324		1752	3447	
Peak-hour factor, PHF	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. Flow (vph)	220	488	68	101	530	238	91	320	58	147	511	38
RTOR Reduction (vph)	0	12	0	0	56	0	0	16	0	0	5	0
Lane Group Flow (vph)	220	544	0	101	712	0	91	362	0	147	544	0
Confl. Peds. (#/hr)			31			31			30			37
Confl. Bikes (#/hr)			9			7			27			27
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.0	29.0		8.6	27.1		8.4	24.9		11.0	28.5	
Effective Green, g (s)	11.0	29.0		8.6	27.1		8.4	24.9		11.0	28.5	
Actuated g/C Ratio	0.12	0.32		0.10	0.30		0.09	0.28		0.12	0.32	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	415	1101		170	1008		160	919		214	1091	
v/s Ratio Prot	c0.06	0.16		0.06	c0.21		0.05	0.11		c0.08	c0.16	
v/s Ratio Perm												
v/c Ratio	0.53	0.49		0.59	0.71		0.57	0.39		0.69	0.50	
Uniform Delay, d1	37.1	24.6		39.0	27.9		39.1	26.4		37.8	24.9	
Progression Factor	1.28	0.79		1.00	1.00		1.00	1.00		1.01	0.86	
Incremental Delay, d2	1.2	1.5		5.5	4.2		4.6	1.3		8.5	1.6	
Delay (s)	48.8	20.9		44.5	32.1		43.6	27.7		46.7	23.1	
Level of Service	D	C		D	C		D	C		D	C	
Approach Delay (s)		28.8			33.5			30.8			28.1	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	69.6%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	149	0	0	0	0	1506	0	0	0	0	1419	234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	149	0	0	0	0	1506	0	0	0	0	1419	234
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	149	0	0	0	0	1506	0	0	0	0	1419	234
Confl. Bikes (#/hr)		2										
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	8.0					45.0					29.0	45.0
Effective Green, g (s)	8.0					45.0					29.0	45.0
Actuated g/C Ratio	0.18					1.00					0.64	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	581					1627					2303	2814
v/s Ratio Prot	0.05										0.40	0.08
v/s Ratio Perm						c0.93						
v/c Ratio	0.26					0.93					0.62	0.08
Uniform Delay, d1	15.9					0.0					4.7	0.0
Progression Factor	1.00					1.00					1.73	1.00
Incremental Delay, d2	1.1					10.5					1.1	0.0
Delay (s)	17.0					10.5					9.2	0.0
Level of Service	B					B					A	A
Approach Delay (s)		17.0			10.5			0.0			7.9	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	1.13			
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	50.1%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	159	10	57	72	0	22	0	71	2	43	5
Peak Hour 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
Hourly flow rate (vph)	0	159	10	57	72	0	22	0	71	2	43	5

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	169	129	22	71	50
Volume Left (vph)	0	57	22	0	2
Volume Right (vph)	10	0	0	71	5
Hadj (s)	-0.02	0.12	0.50	-0.70	-0.02
Departure Headway (s)	4.4	4.6	5.7	4.5	4.8
Degree Utilization, x	0.21	0.16	0.04	0.09	0.07
Capacity (veh/h)	792	751	591	739	693
Control Delay (s)	8.5	8.4	7.8	6.8	8.1
Approach Delay (s)	8.5	8.4	7.0		8.1
Approach LOS	A	A	A		A

Intersection Summary				
Delay	8.1			
Level of Service	A			
Intersection Capacity Utilization	36.2%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	5	144	1	4	77	20	1	0	3	15	0	3
Peak Hour 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
Hourly flow rate (vph)	5	144	1	4	77	20	1	0	3	15	0	3

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	150	101	4	18
Volume Left (vph)	5	4	1	15
Volume Right (vph)	1	20	3	3
Hadj (s)	0.02	-0.11	-0.40	0.07
Departure Headway (s)	4.1	4.0	4.1	4.5
Degree Utilization, x	0.17	0.11	0.00	0.02
Capacity (veh/h)	872	890	827	744
Control Delay (s)	7.9	7.5	7.1	7.6
Approach Delay (s)	7.9	7.5	7.1	7.6
Approach LOS	A	A	A	A

Intersection Summary				
Delay			7.7	
Level of Service			A	
Intersection Capacity Utilization			21.4%	ICU Level of Service
Analysis Period (min)			15	
				A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	354	0	4	312	10	6	11	14	32	12	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	2	354	0	4	312	10	6	11	14	32	12	8
Pedestrians		8			2			10			11	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	333			364			715	709	366	716	704	336
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	333			364			715	709	366	716	704	336
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	97	98	90	97	99
cM capacity (veh/h)	1221			1196			325	353	677	321	353	695

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	356	326	31	52
Volume Left	2	4	6	32
Volume Right	0	10	14	8
cSH	1221	1196	441	358
Volume to Capacity	0.00	0.00	0.07	0.15
Queue Length 95th (ft)	0	0	6	13
Control Delay (s)	0.1	0.1	13.8	16.7
Lane LOS	A	A	B	C
Approach Delay (s)	0.1	0.1	13.8	16.7
Approach LOS			B	C

Intersection Summary				
Average Delay			1.8	
Intersection Capacity Utilization			35.4%	ICU Level of Service
Analysis Period (min)			15	
				A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	34	1572	201	0	1596
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	34	1572	201	0	1596
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			154			137
pX, platoon unblocked	0.86	0.78			0.78	
vC, conflicting volume	2204	624			1773	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	682	0			1026	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	329	851			528	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	34	629	629	515	532	532	532
Volume Left	0	0	0	0	0	0	0
Volume Right	34	0	0	201	0	0	0
cSH	851	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.04	0.37	0.37	0.30	0.31	0.31	0.31
Queue Length 95th (ft)	3	0	0	0	0	0	0
Control Delay (s)	9.4	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	9.4	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	44.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	1	1630	25	0	1692
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	1	1630	25	0	1692
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			424			204
pX, platoon unblocked	0.81					
vC, conflicting volume	2206	556			1655	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1652	556			1655	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	72	475			386	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	1	652	652	351	564	564	564
Volume Left	0	0	0	0	0	0	0
Volume Right	1	0	0	25	0	0	0
cSH	475	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.38	0.38	0.21	0.33	0.33	0.33
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	12.6	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	12.6	0.0			0.0		
Approach LOS	B						

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	42.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	12	247	161	49	137	42	22	198	1580	135	86	1295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.99			0.99			1.00	0.99		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.95			0.98			1.00	0.99		1.00	1.00
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1756			1751			1770	4995		1770	5074
Flt Permitted		0.99			0.70			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1739			1233			1770	4995		1770	5074
Peak-hour factor, PHF	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. Flow (vph)	12	247	161	49	137	42	22	198	1580	135	86	1295
RTOR Reduction (vph)	0	24	0	0	9	0	0	0	8	0	0	1
Lane Group Flow (vph)	0	396	0	0	219	0	0	220	1707	0	86	1308
Confl. Peds. (#/hr)	11		15	15		11		12		20	20	
Confl. Bikes (#/hr)			16			12				15		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		28.2			28.2			22.4	48.9		8.4	34.9
Effective Green, g (s)		28.2			28.2			22.4	48.9		8.4	34.9
Actuated g/C Ratio		0.28			0.28			0.22	0.49		0.08	0.35
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		490			347			396	2442		148	1770
v/s Ratio Prot								0.12	c0.34		0.05	c0.26
v/s Ratio Perm		c0.23			0.18							
v/c Ratio		0.81			0.63			0.56	0.70		0.58	0.74
Uniform Delay, d1		33.4			31.3			34.4	19.8		44.1	28.6
Progression Factor		1.00			1.00			0.50	0.34		1.00	1.00
Incremental Delay, d2		9.4			3.7			1.5	1.5		5.7	2.8
Delay (s)		42.8			35.0			18.8	8.2		49.8	31.4
Level of Service		D			D			B	A		D	C
Approach Delay (s)		42.8			35.0				9.4			32.5
Approach LOS		D			D				A			C

Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	86.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	14
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	14
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	12
Confl. Bikes (#/hr)	15
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	17	438	9	6	174	9	12	12	22	11	9	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	17	438	9	6	174	9	12	12	22	11	9	30
Pedestrians		4			13			7			17	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked				0.95			0.95	0.95	0.95	0.95	0.95	
vC, conflicting volume	200			454			712	696	462	725	696	200
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	200			395			668	650	404	681	650	200
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			96	97	96	96	97	96
cM capacity (veh/h)	1335			1085			322	356	606	306	352	824

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	464	189	46	50
Volume Left	17	6	12	11
Volume Right	9	9	22	30
cSH	1335	1085	429	511
Volume to Capacity	0.01	0.01	0.11	0.10
Queue Length 95th (ft)	1	0	9	8
Control Delay (s)	0.4	0.3	14.4	12.8
Lane LOS	A	A	B	B
Approach Delay (s)	0.4	0.3	14.4	12.8
Approach LOS			B	B

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	45.0%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
Existing PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	340	43	16	134	36	27	523	33	18	530	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.97			0.99			0.99	
Flt Protected		0.99			1.00			1.00			1.00	
Satd. Flow (prot)		1761			1772			1839			1863	
Flt Permitted		0.93			0.96			0.96			0.98	
Satd. Flow (perm)		1644			1703			1775			1824	
Peak-hour factor, PHF	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. Flow (vph)	70	340	43	16	134	36	27	523	33	18	530	24
RTOR Reduction (vph)	0	4	0	0	11	0	0	3	0	0	2	0
Lane Group Flow (vph)	0	449	0	0	175	0	0	580	0	0	570	0
Confl. Peds. (#/hr)	11		11	11		11	19		7	7		19
Confl. Bikes (#/hr)			15			10			31			22
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		29.0			29.0			43.0			43.0	
Effective Green, g (s)		29.0			29.0			43.0			43.0	
Actuated g/C Ratio		0.36			0.36			0.54			0.54	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		595			617			954			980	
v/s Ratio Prot												
v/s Ratio Perm		c0.27			0.10			c0.33			0.31	
v/c Ratio		0.75			0.28			0.61			0.58	
Uniform Delay, d1		22.4			18.1			12.7			12.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		8.6			1.2			2.9			2.5	
Delay (s)		31.0			19.3			15.6			15.0	
Level of Service		C			B			B			B	
Approach Delay (s)		31.0			19.3			15.6			15.0	
Approach LOS		C			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	88.1%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
Existing PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	275	20	94	38	14	18	70	880	57	20	925	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			0.99		0.99	1.00		0.99	1.00	
Frt		0.97			0.97		1.00	0.99		1.00	0.99	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1658			1692		1752	3490		1772	3488	
Flt Permitted		0.76			0.77		0.21	1.00		0.24	1.00	
Satd. Flow (perm)		1310			1343		392	3490		453	3488	
Peak-hour factor, PHF	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. Flow (vph)	275	20	94	38	14	18	70	880	57	20	925	96
RTOR Reduction (vph)	0	14	0	0	12	0	0	5	0	0	8	0
Lane Group Flow (vph)	0	375	0	0	58	0	70	932	0	20	1013	0
Confl. Peds. (#/hr)	11		26	26		11	25		17	17		25
Confl. Bikes (#/hr)			8			9			29			45
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		30.4			30.4		50.6	50.6		50.6	50.6	
Effective Green, g (s)		30.4			30.4		50.6	50.6		50.6	50.6	
Actuated g/C Ratio		0.34			0.34		0.56	0.56		0.56	0.56	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		442			453		220	1962		254	1961	
v/s Ratio Prot								0.27			c0.29	
v/s Ratio Perm		c0.29			0.04		0.18			0.04		
v/c Ratio		0.85			0.13		0.32	0.48		0.08	0.52	
Uniform Delay, d1		27.7			20.6		10.5	11.8		9.0	12.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		14.1			0.1		3.8	0.8		0.6	1.0	
Delay (s)		41.7			20.8		14.3	12.6		9.6	13.1	
Level of Service		D			C		B	B		A	B	
Approach Delay (s)		41.7			20.8			12.7			13.1	
Approach LOS		D			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	73.2%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (veh/h)	4	5	38	14	2	8	5	32	1903	15	6	9
Sign Control		Stop			Stop				Free			
Grade		0%			0%				0%			
Peak Hour 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
Hourly flow rate (vph)	4	5	38	14	2	8	0	32	1903	15	0	9
Pedestrians		5			19				11			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		0			2				1			
Right turn flare (veh)												
Median type									None			
Median storage veh)												
Upstream signal (ft)									299			
pX, platoon unblocked	0.88	0.88	0.78	0.88	0.88	0.80	0.00	0.78			0.00	0.80
vC, conflicting volume	2230	3524	518	2562	3520	661	0	1508			0	1937
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	364	1838	0	742	1833	0	0	648			0	1291
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			0.0	4.1
tC, 2 stage (s)												
tF (s)	*4.0	4.0	*4.0	*4.0	4.0	*4.0	0.0	2.2			0.0	2.2
p0 queue free %	99	92	94	93	97	99	0	96			0	98
cM capacity (veh/h)	405	62	690	200	62	707	0	722			0	423

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	47	24	508	952	491	383	748	381
Volume Left	4	14	32	0	0	9	0	0
Volume Right	38	8	0	0	15	0	0	7
cSH	321	211	722	1700	1700	423	1700	1700
Volume to Capacity	0.15	0.11	0.04	0.56	0.29	0.02	0.44	0.22
Queue Length 95th (ft)	13	9	3	0	0	2	0	0
Control Delay (s)	18.1	24.2	1.2	0.0	0.0	0.7	0.0	0.0
Lane LOS	C	C	A			A		
Approach Delay (s)	18.1	24.2	0.3			0.2		
Approach LOS	C	C						

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	76.7%	ICU Level of Service	D	
Analysis Period (min)	15			

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
5: MLK Way & 54th Street

Children's Hospital
Existing PM Plus Phase 1

Movement	SBT	SBR
Lane Configurations		
Volume (veh/h)	1496	7
Sign Control	Free	
Grade	0%	
Peak Hour Factor	1.00	1.00
Hourly flow rate (vph)	1496	7
Pedestrians		
Lane Width (ft)		
Walking Speed (ft/s)		
Percent Blockage		
Right turn flare (veh)		
Median type	None	
Median storage veh)		
Upstream signal (ft)	294	
pX, platoon unblocked		
vC, conflicting volume		
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol		
tC, single (s)		
tC, 2 stage (s)		
tF (s)		
p0 queue free %		
cM capacity (veh/h)		

Direction, Lane #

Fehr & Peers

Synchro 8 Report

HCM Unsignalized Intersection Capacity Analysis
6: Dover Street & 54th Street

Children's Hospital
Existing PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	10	4	2	5	11	8	31	4	7	17	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	8	10	4	2	5	11	8	31	4	7	17	2
Pedestrians		12			8			6			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	110	103	36	104	102	44	31			43		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	110	103	36	104	102	44	31			43		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	100	100	99	99	99			100		
cM capacity (veh/h)	832	770	1027	842	771	1022	1579			1568		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	22	18	43	26
Volume Left	8	2	8	7
Volume Right	4	11	4	2
cSH	831	918	1579	1568
Volume to Capacity	0.03	0.02	0.01	0.00
Queue Length 95th (ft)	2	1	0	0
Control Delay (s)	9.5	9.0	1.4	2.0
Lane LOS	A	A	A	A
Approach Delay (s)	9.5	9.0	1.4	2.0
Approach LOS	A	A		

Intersection Summary				
Average Delay		4.4		
Intersection Capacity Utilization		18.4%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
7: Shattuck Ave & 54th Street

Children's Hospital
Existing PM Plus Phase 1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	3	14	11	601	614	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	3	14	11	601	614	3
Pedestrians	25				1	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	2				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.83	0.79	0.79			
vC, conflicting volume	1264	640	642			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1003	416	418			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	97	99			
cM capacity (veh/h)	218	498	886			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	17	612	617
Volume Left	3	11	0
Volume Right	14	0	3
cSH	406	886	1700
Volume to Capacity	0.04	0.01	0.36
Queue Length 95th (ft)	3	1	0
Control Delay (s)	14.3	0.3	0.0
Lane LOS	B	A	
Approach Delay (s)	14.3	0.3	0.0
Approach LOS	B		

Intersection Summary				
Average Delay		0.4		
Intersection Capacity Utilization		50.4%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	2	5	46	23	6	6	7	9	1962	48	12	1565
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.88			0.98			1.00	1.00		1.00	1.00
Flt Protected		1.00			0.97			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1612			1787			1770	5053		1787	5133
Flt Permitted		0.99			0.82			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1603			1509			1770	5053		1787	5133
Peak-hour factor, PHF	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. Flow (vph)	2	5	46	23	6	6	7	9	1962	48	12	1565
RTOR Reduction (vph)	0	39	0	0	5	0	0	0	2	0	0	0
Lane Group Flow (vph)	0	14	0	0	30	0	0	16	2008	0	12	1569
Confl. Peds. (#/hr)	8		4	4		8		14		32	32	
Confl. Bikes (#/hr)			4			2				13		
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		15.9			15.9			3.0	69.8		1.8	68.6
Effective Green, g (s)		15.9			15.9			3.0	69.8		1.8	68.6
Actuated g/C Ratio		0.16			0.16			0.03	0.70		0.02	0.69
Clearance Time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		254			239			53	3526		32	3521
v/s Ratio Prot								0.01	c0.40		0.01	c0.31
v/s Ratio Perm		0.01			c0.02							
v/c Ratio		0.06			0.13			0.30	0.57		0.38	0.45
Uniform Delay, d1		35.7			36.1			47.5	7.6		48.5	7.1
Progression Factor		1.00			1.08			1.44	0.19		0.77	0.46
Incremental Delay, d2		0.1			0.2			2.4	0.5		5.4	0.3
Delay (s)		35.8			39.1			70.7	1.9		42.9	3.6
Level of Service		D			D			E	A		D	A
Approach Delay (s)		35.8			39.1				2.5			3.9
Approach LOS		D			D				A			A

Intersection Summary			
HCM 2000 Control Delay	3.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: MLK Way & 53rd Street

Children's Hospital
Existing PM Plus Phase 1

Movement	SBR
Lane Configurations	
Volume (vph)	4
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	4
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	14
Confl. Bikes (#/hr)	16
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Fehr & Peers

Synchro 8 Report

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	11	2	50	3	3	5	8	30	6	1	20	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	11	2	50	3	3	5	8	30	6	1	20	8
Pedestrians		25			10			4			4	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			1			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	110	113	53	140	114	47	53			46		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	110	113	53	140	114	47	53			46		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	95	100	100	100	99			100		
cM capacity (veh/h)	822	754	996	761	753	1016	1533			1562		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	63	11	44	29
Volume Left	11	3	8	1
Volume Right	50	5	6	8
cSH	951	856	1533	1562
Volume to Capacity	0.07	0.01	0.01	0.00
Queue Length 95th (ft)	5	1	0	0
Control Delay (s)	9.1	9.3	1.4	0.3
Lane LOS	A	A	A	A
Approach Delay (s)	9.1	9.3	1.4	0.3
Approach LOS	A	A		

Intersection Summary				
Average Delay		5.0		
Intersection Capacity Utilization		21.5%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	66	117	95	121	83	207	42	74	1676	80	3	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.97			1.00	0.97		1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00			0.98	1.00		1.00	1.00			1.00
Frt	1.00	0.93			1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00			0.97	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1768	1694			1766	1535		1787	5092			1787
Flt Permitted	0.51	1.00			0.56	1.00		0.95	1.00			0.95
Satd. Flow (perm)	957	1694			1019	1535		1787	5092			1787
Peak-hour factor, PHF	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. Flow (vph)	66	117	95	121	83	207	42	74	1676	80	3	141
RTOR Reduction (vph)	0	32	0	0	0	155	0	0	4	0	0	0
Lane Group Flow (vph)	66	181	0	0	204	52	0	116	1752	0	0	144
Confl. Peds. (#/hr)	16		61	61		16		13		10		10
Confl. Bikes (#/hr)			9			4				15		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	25.0	25.0			25.0	25.0		10.8	44.0			17.5
Effective Green, g (s)	25.0	25.0			25.0	25.0		10.8	44.0			17.5
Actuated g/C Ratio	0.25	0.25			0.25	0.25		0.11	0.44			0.18
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	239	423			254	383		192	2240			312
v/s Ratio Prot		0.11						0.06	c0.34			0.08
v/s Ratio Perm	0.07				c0.20	0.03						
v/c Ratio	0.28	0.43			0.80	0.14		0.60	0.78			0.46
Uniform Delay, d1	30.2	31.5			35.2	29.1		42.6	23.9			37.0
Progression Factor	1.00	1.00			0.94	2.22		0.98	1.06			0.57
Incremental Delay, d2	0.2	0.3			15.3	0.1		1.6	1.2			0.4
Delay (s)	30.4	31.7			48.5	64.5		43.3	26.5			21.6
Level of Service	C	C			D	E		D	C			C
Approach Delay (s)		31.4			56.6				27.5			
Approach LOS		C			E				C			

Intersection Summary				
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	101.0%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1505	1
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5135	
Flt Permitted	1.00	
Satd. Flow (perm)	5135	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1505	1
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1506	0
Confl. Peds. (#/hr)		13
Confl. Bikes (#/hr)		17
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	50.2	
Effective Green, g (s)	50.2	
Actuated g/C Ratio	0.50	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2577	
v/s Ratio Prot	c0.29	
v/s Ratio Perm		
v/c Ratio	0.58	
Uniform Delay, d1	17.5	
Progression Factor	0.23	
Incremental Delay, d2	0.9	
Delay (s)	5.0	
Level of Service	A	
Approach Delay (s)	6.5	
Approach LOS	A	

Intersection Summary			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	333	5	11	333	2	25	3	13	0	4	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.95			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.96			0.87	
Flt Protected		1.00			1.00			0.97			1.00	
Satd. Flow (prot)		3522			3592			1452			1640	
Flt Permitted		0.95			0.94			0.89			1.00	
Satd. Flow (perm)		3364			3393			1333			1640	
Peak-hour factor, PHF	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. Flow (vph)	3	333	5	11	333	2	25	3	13	0	4	59
RTOR Reduction (vph)	0	2	0	0	1	0	0	7	0	0	32	0
Lane Group Flow (vph)	0	339	0	0	345	0	0	34	0	0	31	0
Confl. Peds. (#/hr)	25		59	59		25			208	208		
Confl. Bikes (#/hr)			10			6						1
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Prot	NA		Perm	NA		Perm	NA			NA	
Protected Phases	5	2			6			4			8	
Permitted Phases				6			4			8		
Actuated Green, G (s)		21.0			14.0			23.0			23.0	
Effective Green, g (s)		21.0			14.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.28			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1425			950			613			754	
v/s Ratio Prot		c0.02									0.02	
v/s Ratio Perm		0.08			c0.10			c0.03				
v/c Ratio		0.24			0.36			0.06			0.04	
Uniform Delay, d1		9.3			14.4			7.5			7.4	
Progression Factor		1.66			1.00			1.00			1.00	
Incremental Delay, d2		0.3			1.1			0.2			0.1	
Delay (s)		15.8			15.5			7.7			7.5	
Level of Service		B			B			A			A	
Approach Delay (s)		15.8			15.5			7.7			7.5	
Approach LOS		B			B			A			A	

Intersection Summary					
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.18				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	9.0		
Intersection Capacity Utilization	43.1%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	319	7	5	328	26	5	2	8	57	1	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	18	319	7	5	328	26	5	2	8	57	1	21
Pedestrians		37			7			35			15	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			1			3			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.90			0.90			0.95	0.95	0.90	0.95	0.95	0.90
vC, conflicting volume	369			361			803	772	364	740	763	393
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	250			231			536	504	235	470	494	276
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	98			100			99	100	99	87	100	97
cM capacity (veh/h)	1170			1170			364	408	680	442	426	664

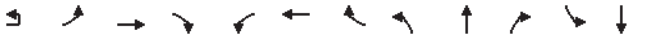
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	344	359	15	79
Volume Left	18	5	5	57
Volume Right	7	26	8	21
cSH	1170	1170	493	485
Volume to Capacity	0.02	0.00	0.03	0.16
Queue Length 95th (ft)	1	0	2	14
Control Delay (s)	0.6	0.2	12.5	13.9
Lane LOS	A	A	B	B
Approach Delay (s)	0.6	0.2	12.5	13.9
Approach LOS			B	B

Intersection Summary					
Average Delay	1.9				
Intersection Capacity Utilization	46.8%	ICU Level of Service		A	
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	381	0	0	366	996	0	1024	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	381	0	0	366	996	0	1024	0	0
Pedestrians							33		9	
Lane Width (ft)							12.0		0.0	
Walking Speed (ft/s)							4.0		4.0	
Percent Blockage							3		0	
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.84						0.84		0.84	0.84
vC, conflicting volume	1371			414			1785	224	1590	789
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1052			414			1547	224	1313	356
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	550			1110			92	755	0	462

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	190	190	244	454	664	512	512
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	332	664	512	512
cSH	1700	1700	1700	1700	1700	755	755
Volume to Capacity	0.11	0.11	0.14	0.27	0.39	0.68	0.68
Queue Length 95th (ft)	0	0	0	0	0	134	134
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	19.2	19.2
Lane LOS						C	C
Approach Delay (s)	0.0		0.0			19.2	
Approach LOS						C	

Intersection Summary					
Average Delay	7.1				
Intersection Capacity Utilization	54.9%	ICU Level of Service		A	
Analysis Period (min)	15				



Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	40	302	871	172	35	831	129	146	207	40	140	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.99		1.00	0.99		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			0.99
Frt		1.00	0.98		1.00	0.98		1.00	0.98			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.98
Satd. Flow (prot)		1787	4948		1805	5037		1747	1783			1716
Flt Permitted		0.95	1.00		0.95	1.00		0.30	1.00			0.72
Satd. Flow (perm)		1787	4948		1805	5037		554	1783			1268
Peak-hour factor, PHF	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. Flow (vph)	40	302	871	172	35	831	129	146	207	40	140	143
RTOR Reduction (vph)	0	0	25	0	0	19	0	0	6	0	0	0
Lane Group Flow (vph)	0	342	1018	0	35	941	0	146	241	0	0	283
Confl. Peds. (#/hr)		11		14	14		11	18		22	22	
Confl. Bikes (#/hr)				13			8			30		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		33.5	57.2		3.9	27.6		34.9	34.9			25.4
Effective Green, g (s)		33.5	57.2		3.9	27.6		34.9	34.9			25.4
Actuated g/C Ratio		0.30	0.52		0.04	0.25		0.32	0.32			0.23
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		544	2572		63	1263		235	565			292
v/s Ratio Prot		c0.19	0.21		0.02	c0.19		c0.03	0.14			
v/s Ratio Perm								0.17				c0.22
v/c Ratio		0.63	0.40		0.56	0.75		0.62	0.43			0.97
Uniform Delay, d1		32.9	16.0		52.2	38.0		31.3	29.6			41.9
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Incremental Delay, d2		5.4	0.5		10.2	4.0		5.0	2.3			45.4
Delay (s)		38.3	16.4		62.4	42.0		36.4	32.0			87.3
Level of Service		D	B		E	D		D	C			F
Approach Delay (s)			21.8			42.7			33.6			59.2
Approach LOS			C			D			C			E

Intersection Summary			
HCM 2000 Control Delay	36.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	100.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	346
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.94
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1421
Flt Permitted	1.00
Satd. Flow (perm)	1421
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	346
RTOR Reduction (vph)	266
Lane Group Flow (vph)	80
Confl. Peds. (#/hr)	18
Confl. Bikes (#/hr)	27
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	25.4
Effective Green, g (s)	25.4
Actuated g/C Ratio	0.23
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	328
v/s Ratio Prot	
v/s Ratio Perm	0.06
v/c Ratio	0.24
Uniform Delay, d1	34.5
Progression Factor	1.00
Incremental Delay, d2	1.8
Delay (s)	36.2
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
15: Telegraph Ave & 52nd Street/Claremont Ave

Children's Hospital
Existing PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	13	7	13	99	72	157	14	842	224	101	667	281
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.95			0.99		1.00	0.93	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.95		1.00	0.90			0.97		1.00	0.96	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1623		1698	1532			3794		1770	3149	
Flt Permitted		0.98		0.95	1.00			0.94		0.95	1.00	
Satd. Flow (perm)		1623		1698	1532			3561		1770	3149	
Peak-hour factor, PHF	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. Flow (vph)	13	7	13	99	72	157	14	842	224	101	667	281
RTOR Reduction (vph)	0	12	0	0	74	0	0	19	0	0	36	0
Lane Group Flow (vph)	0	21	0	89	165	0	0	1061	0	101	912	0
Confl. Peds. (#/hr)	34					34	70		22	22		70
Confl. Bikes (#/hr)			1			10			35			48
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		4.6		16.9	16.9			51.2		9.3	65.0	
Effective Green, g (s)		4.6		16.9	16.9			51.2		9.3	65.0	
Actuated g/C Ratio		0.05		0.17	0.17			0.51		0.09	0.65	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		74		286	258			1823		164	2046	
v/s Ratio Prot		c0.01		0.05	c0.11					c0.06	0.29	
v/s Ratio Perm								c0.30				
v/c Ratio		0.28		0.31	0.64			0.58		0.62	0.45	
Uniform Delay, d1		46.1		36.4	38.7			17.0		43.6	8.6	
Progression Factor		1.88		1.00	1.00			0.60		1.00	1.00	
Incremental Delay, d2		1.2		0.6	5.1			1.1		6.7	0.7	
Delay (s)		87.7		37.1	43.9			11.3		50.3	9.3	
Level of Service		F		D	D			B		D	A	
Approach Delay (s)		87.7			42.0			11.3			13.3	
Approach LOS		F			D			B			B	

Intersection Summary				
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	87.3%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
16: Telegraph Ave & 51St Street

Children's Hospital
Existing PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	305	607	85	56	477	229	79	574	97	262	476	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.97		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3402		1787	3314		1719	3311		1752	3401	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3402		1787	3314		1719	3311		1752	3401	
Peak-hour factor, PHF	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. Flow (vph)	305	607	85	56	477	229	79	574	97	262	476	44
RTOR Reduction (vph)	0	11	0	0	57	0	0	13	0	0	7	0
Lane Group Flow (vph)	305	681	0	56	649	0	79	658	0	262	513	0
Confl. Peds. (#/hr)	38		52	52		38	92		57	57		92
Confl. Bikes (#/hr)			8			15			34			54
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.0	29.3		7.4	23.2		7.7	33.8		13.0	40.1	
Effective Green, g (s)	14.0	29.3		7.4	23.2		7.7	33.8		13.0	40.1	
Actuated g/C Ratio	0.14	0.29		0.07	0.23		0.08	0.34		0.13	0.40	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	476	996		132	768		132	1119		227	1363	
v/s Ratio Prot	c0.09	0.20		0.03	c0.20		0.05	c0.20		c0.15	0.15	
v/s Ratio Perm												
v/c Ratio	0.64	0.68		0.42	0.85		0.60	0.59		1.15	0.38	
Uniform Delay, d1	40.6	31.3		44.3	36.7		44.7	27.3		43.5	21.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.17	0.74	
Incremental Delay, d2	2.9	3.8		2.2	11.1		7.1	2.3		105.5	0.7	
Delay (s)	43.6	35.1		46.5	47.7		51.8	29.6		156.5	16.3	
Level of Service	D	D		D	D		D	C		F	B	
Approach Delay (s)		37.7			47.6			31.9			63.3	
Approach LOS		D			D			C			E	

Intersection Summary				
HCM 2000 Control Delay	44.8	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	78.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	268	0	0	0	0	1616	0	0	0	0	1555	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	268	0	0	0	0	1616	0	0	0	0	1555	235
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	268	0	0	0	0	1616	0	0	0	0	1555	235
Confl. Peds. (#/hr)			2	2			18					18
Confl. Bikes (#/hr)									9			12
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	13.0					50.0					29.0	50.0
Effective Green, g (s)	13.0					50.0					29.0	50.0
Actuated g/C Ratio	0.26					1.00					0.58	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	850					1627					2072	2814
v/s Ratio Prot	0.08										0.44	0.08
v/s Ratio Perm						c0.99						
v/c Ratio	0.32					0.99					0.75	0.08
Uniform Delay, d1	14.9					0.0					7.8	0.0
Progression Factor	1.00					1.00					2.65	1.00
Incremental Delay, d2	1.0					20.8					2.1	0.0
Delay (s)	15.9					20.8					22.8	0.0
Level of Service	B					C					C	A
Approach Delay (s)		15.9			20.8			0.0			19.8	
Approach LOS		B			C			A			B	

Intersection Summary				
HCM 2000 Control Delay	19.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	1.18			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	57.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	112	8	83	93	0	43	0	134	6	52	4
Peak Hour 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
Hourly flow rate (vph)	0	112	8	83	93	0	43	0	134	6	52	4

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	120	176	43	134	62
Volume Left (vph)	0	83	43	0	6
Volume Right (vph)	8	0	0	134	4
Hadj (s)	-0.02	0.13	0.50	-0.70	0.01
Departure Headway (s)	4.7	4.8	5.8	4.6	5.0
Degree Utilization, x	0.16	0.23	0.07	0.17	0.09
Capacity (veh/h)	718	715	588	736	668
Control Delay (s)	8.5	9.2	8.0	7.3	8.4
Approach Delay (s)	8.5	9.2	7.5		8.4
Approach LOS	A	A	A		A

Intersection Summary				
Delay	8.4			
Level of Service	A			
Intersection Capacity Utilization	35.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	1	110	2	2	96	36	2	0	3	11	0	3
Peak Hour 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
Hourly flow rate (vph)	1	110	2	2	96	36	2	0	3	11	0	3

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	113	134	5	14
Volume Left (vph)	1	2	2	11
Volume Right (vph)	2	36	3	3
Hadj (s)	0.01	-0.16	-0.28	0.03
Departure Headway (s)	4.1	3.9	4.1	4.4
Degree Utilization, x	0.13	0.14	0.01	0.02
Capacity (veh/h)	870	912	809	753
Control Delay (s)	7.7	7.5	7.2	7.5
Approach Delay (s)	7.7	7.5	7.2	7.5
Approach LOS	A	A	A	A

Intersection Summary				
Delay			7.6	
Level of Service			A	
Intersection Capacity Utilization		20.2%	ICU Level of Service	A
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (veh/h)	12	370	1	10	339	29	8	18	29	27	3	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	12	370	1	10	339	29	8	18	29	27	3	10
Pedestrians		5						7			3	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	371			378			792	792	378	809	778	362
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	371			378			792	792	378	809	778	362
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			97	94	96	90	99	99
cM capacity (veh/h)	1190			1185			294	315	670	267	319	679

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	383	378	55	40
Volume Left	12	10	8	27
Volume Right	1	29	29	10
cSH	1190	1185	431	320
Volume to Capacity	0.01	0.01	0.13	0.13
Queue Length 95th (ft)	1	1	11	11
Control Delay (s)	0.4	0.3	14.6	17.9
Lane LOS	A	A	B	C
Approach Delay (s)	0.4	0.3	14.6	17.9
Approach LOS			B	C

Intersection Summary				
Average Delay			2.1	
Intersection Capacity Utilization		40.3%	ICU Level of Service	A
Analysis Period (min)			15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	123	1918	34	0	1641
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	123	1918	34	0	1641
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			154			137
pX, platoon unblocked	0.78	0.71			0.71	
vC, conflicting volume	2482	656			1952	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	692	0			892	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	84			100	
cM capacity (veh/h)	293	766			534	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	123	767	767	418	547	547	547
Volume Left	0	0	0	0	0	0	0
Volume Right	123	0	0	34	0	0	0
cSH	766	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.16	0.45	0.45	0.25	0.32	0.32	0.32
Queue Length 95th (ft)	14	0	0	0	0	0	0
Control Delay (s)	10.6	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	10.6	0.0			0.0		
Approach LOS	B						

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	52.1%	ICU Level of Service		A
Analysis Period (min)	15			

Appendix G

LOS Calculation Worksheets – Existing Plus Phase 2 Conditions

FEHR PEERS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	13	170	219	54	217	57	14	127	1346	59	52	1250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.93			0.98			1.00	0.99		1.00	1.00
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1707			1759			1770	5039		1770	5064
Flt Permitted		0.98			0.77			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1683			1364			1770	5039		1770	5064
Peak-hour factor, PHF	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. Flow (vph)	13	170	219	54	217	57	14	127	1346	59	52	1250
RTOR Reduction (vph)	0	56	0	0	10	0	0	0	4	0	0	2
Lane Group Flow (vph)	0	346	0	0	318	0	0	141	1401	0	52	1275
Confl. Peds. (#/hr)	7		14	14		7				21		
Confl. Bikes (#/hr)			16			15				6		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		25.9			25.9			15.3	45.1		4.5	34.3
Effective Green, g (s)		25.9			25.9			15.3	45.1		4.5	34.3
Actuated g/C Ratio		0.29			0.29			0.17	0.50		0.05	0.38
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		484			392			300	2525		88	1929
v/s Ratio Prot								0.08	c0.28		0.03	c0.25
v/s Ratio Perm		0.21			c0.23							
v/c Ratio		0.72			0.81			0.47	0.55		0.59	0.66
Uniform Delay, d1		28.7			29.8			33.7	15.5		41.8	23.0
Progression Factor		1.00			1.00			0.52	0.12		1.00	1.00
Incremental Delay, d2		5.0			12.0			1.1	0.8		10.2	1.8
Delay (s)		33.7			41.8			18.7	2.6		52.0	24.8
Level of Service		C			D			B	A		D	C
Approach Delay (s)		33.7			41.8				4.1			25.9
Approach LOS		C			D				A			C

Intersection Summary			
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	85.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: MLK Way & 55th Street

Children's Hospital
Existing AM Plus Phase 2

Movement	SBR
Lane Configurations	
Volume (vph)	27
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	27
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	12
Confl. Bikes (#/hr)	7
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis
2: Dover Street & 55th Street

Children's Hospital
Existing AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	259	6	23	296	6	7	8	13	8	6	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	18	259	6	23	296	6	7	8	13	8	6	21
Pedestrians		9			20			15			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked	0.90						0.90	0.90		0.90	0.90	0.90
vC, conflicting volume	308			280			691	667	297	686	667	314
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	182			280			606	579	297	600	579	189
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			98	98	98	98	98	97
cM capacity (veh/h)	1238			1255			338	369	726	338	365	760

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	283	325	28	35
Volume Left	18	23	7	8
Volume Right	6	6	13	21
cSH	1238	1255	464	517
Volume to Capacity	0.01	0.02	0.06	0.07
Queue Length 95th (ft)	1	1	5	5
Control Delay (s)	0.6	0.7	13.3	12.5
Lane LOS	A	A	B	B
Approach Delay (s)	0.6	0.7	13.3	12.5
Approach LOS			B	B

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	37.7%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
Existing AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	199	40	27	253	31	28	430	25	25	544	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.99			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.99			0.99			0.99	
Flt Protected		0.99			1.00			1.00			1.00	
Satd. Flow (prot)		1743			1803			1840			1861	
Flt Permitted		0.90			0.96			0.95			0.97	
Satd. Flow (perm)		1578			1740			1759			1813	
Peak-hour factor, PHF	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. Flow (vph)	50	199	40	27	253	31	28	430	25	25	544	28
RTOR Reduction (vph)	0	8	0	0	5	0	0	2	0	0	2	0
Lane Group Flow (vph)	0	281	0	0	306	0	0	481	0	0	595	0
Confl. Peds. (#/hr)	6		13	13		6	7		17	17		7
Confl. Bikes (#/hr)			22			10			13			24
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		25.0			25.0			47.0			47.0	
Effective Green, g (s)		25.0			25.0			47.0			47.0	
Actuated g/C Ratio		0.31			0.31			0.59			0.59	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		493			543			1033			1065	
v/s Ratio Prot												
v/s Ratio Perm		c0.18			0.18			0.27			c0.33	
v/c Ratio		0.57			0.56			0.47			0.56	
Uniform Delay, d1		23.0			23.0			9.4			10.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		4.7			4.2			1.5			2.1	
Delay (s)		27.8			27.1			10.9			12.2	
Level of Service		C			C			B			B	
Approach Delay (s)		27.8			27.1			10.9			12.2	
Approach LOS		C			C			B			B	

Intersection Summary					
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.56				
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0		
Intersection Capacity Utilization	73.4%	ICU Level of Service	D		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
Existing AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	149	14	77	32	10	9	58	715	40	27	826	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		0.99	1.00	
Frt		0.96			0.98		1.00	0.99		1.00	0.97	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1655			1713		1761	3497		1768	3406	
Flt Permitted		0.78			0.79		0.22	1.00		0.34	1.00	
Satd. Flow (perm)		1332			1403		416	3497		636	3406	
Peak-hour factor, PHF	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. Flow (vph)	149	14	77	32	10	9	58	715	40	27	826	241
RTOR Reduction (vph)	0	29	0	0	7	0	0	4	0	0	29	0
Lane Group Flow (vph)	0	211	0	0	44	0	58	751	0	27	1038	0
Confl. Peds. (#/hr)	6		11	11		6	13		17	17		13
Confl. Bikes (#/hr)			15			15			43			27
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		16.8			16.8		44.2	44.2		44.2	44.2	
Effective Green, g (s)		16.8			16.8		44.2	44.2		44.2	44.2	
Actuated g/C Ratio		0.24			0.24		0.63	0.63		0.63	0.63	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		319			336		262	2208		401	2150	
v/s Ratio Prot								0.21			c0.30	
v/s Ratio Perm		c0.16			0.03		0.14			0.04		
v/c Ratio		0.66			0.13		0.22	0.34		0.07	0.48	
Uniform Delay, d1		24.0			20.9		5.5	6.1		5.0	6.8	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.1			0.2		1.9	0.4		0.3	0.8	
Delay (s)		29.1			21.1		7.5	6.5		5.3	7.6	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		29.1			21.1			6.5			7.6	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	62.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
5: MLK Way & 54th Street

Children's Hospital
Existing AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	4	3	43	5	3	8	10	15	1522	10	5	1497
Sign Control		Stop			Stop				Free			Free
Grade		0%			0%				0%			0%
Peak Hour 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
Hourly flow rate (vph)	4	3	43	5	3	8	0	15	1522	10	5	1497
Pedestrians		7			6				8			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		1			1				1			
Right turn flare (veh)												
Median type									None			None
Median storage veh)												
Upstream signal (ft)									299			294
pX, platoon unblocked	0.87	0.87	0.80	0.87	0.87	0.86	0.00	0.80			0.86	
vC, conflicting volume	2064	3086	518	2124	3084	518	0	1511			1538	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	585	1761	0	655	1759	0	0	750			1044	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	*5.0	*5.0	*5.0	0.0	2.2			2.2	
p0 queue free %	99	96	95	98	96	99	0	98			99	
cM capacity (veh/h)	318	71	859	214	67	614	0	677			570	

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	50	16	396	761	390	379	748	381
Volume Left	4	5	15	0	0	5	0	0
Volume Right	43	8	0	0	10	0	0	7
cSH	477	197	677	1700	1700	570	1700	1700
Volume to Capacity	0.10	0.08	0.02	0.45	0.23	0.01	0.44	0.22
Queue Length 95th (ft)	9	7	2	0	0	1	0	0
Control Delay (s)	13.4	24.9	0.7	0.0	0.0	0.3	0.0	0.0
Lane LOS	B	C	A			A		
Approach Delay (s)	13.4	24.9	0.2			0.1		
Approach LOS	B	C						

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	60.0%	ICU Level of Service	B	
Analysis Period (min)	15			

* User Entered Value

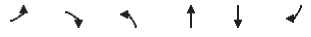
Movement	SBR
Lane Configurations	
Volume (veh/h)	7
Sign Control	
Grade	
Peak Hour Factor	1.00
Hourly flow rate (vph)	7
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	
tC, single (s)	
tC, 2 stage (s)	
tF (s)	
p0 queue free %	
cM capacity (veh/h)	

Direction, Lane #	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	5	6	4	6	9	8	19	11	4	36	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	5	5	6	4	6	9	8	19	11	4	36	5
Pedestrians		10			14			2			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	115	116	50	112	114	44	51			44		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	115	116	50	112	114	44	51			44		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	99	100	99	99	99			100		
cM capacity (veh/h)	825	756	1013	832	759	1014	1555			1559		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	16	19	38	45
Volume Left	5	4	8	4
Volume Right	6	9	11	5
cSH	860	880	1555	1559
Volume to Capacity	0.02	0.02	0.01	0.00
Queue Length 95th (ft)	1	2	0	0
Control Delay (s)	9.3	9.2	1.6	0.7
Lane LOS	A	A	A	A
Approach Delay (s)	9.3	9.2	1.6	0.7
Approach LOS	A	A		

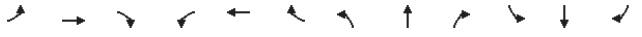
Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	19.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	14	12	488	589	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	14	12	488	589	5
Pedestrians	9			2	1	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.81	0.81	0.81			
vC, conflicting volume	1114	602	603			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1009	388	389			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	99			
cM capacity (veh/h)	213	531	937			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	15	500	594
Volume Left	1	12	0
Volume Right	14	0	5
cSH	483	937	1700
Volume to Capacity	0.03	0.01	0.35
Queue Length 95th (ft)	2	1	0
Control Delay (s)	12.7	0.4	0.0
Lane LOS	B	A	
Approach Delay (s)	12.7	0.4	0.0
Approach LOS	B		

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		46.0%	ICU Level of Service A
Analysis Period (min)		15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	4	34	13	4	12	21	1551	30	11	1558	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.98			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.89			0.94		1.00	1.00		1.00	1.00	
Flt Protected		1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1623			1736		1770	5065		1787	5132	
Flt Permitted		0.98			0.89		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1598			1574		1770	5065		1787	5132	
Peak-hour factor, PHF	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. Flow (vph)	4	4	34	13	4	12	21	1551	30	11	1558	5
RTOR Reduction (vph)	0	29	0	0	10	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	13	0	0	19	0	21	1580	0	11	1563	0
Confl. Peds. (#/hr)	7		13	13		7			13			20
Confl. Bikes (#/hr)									5			13
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		14.5			14.5		3.0	61.2		1.8	60.0	
Effective Green, g (s)		14.5			14.5		3.0	61.2		1.8	60.0	
Actuated g/C Ratio		0.16			0.16		0.03	0.68		0.02	0.67	
Clearance Time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		257			253		59	3444		35	3421	
v/s Ratio Prot							0.01	c0.31		0.01	c0.30	
v/s Ratio Perm		0.01			c0.01							
v/c Ratio		0.05			0.07		0.36	0.46		0.31	0.46	
Uniform Delay, d1		31.9			32.1		42.6	6.7		43.5	7.2	
Progression Factor		1.00			1.01		1.18	0.49		0.52	0.22	
Incremental Delay, d2		0.1			0.1		2.9	0.4		4.2	0.4	
Delay (s)		32.0			32.7		53.1	3.6		26.6	2.0	
Level of Service		C			C		D	A		C	A	
Approach Delay (s)		32.0			32.7			4.3			2.1	
Approach LOS		C			C			A			A	

Intersection Summary					
HCM 2000 Control Delay	3.8	HCM 2000 Level of Service		A	
HCM 2000 Volume to Capacity ratio	0.40				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		12.5	
Intersection Capacity Utilization	52.6%	ICU Level of Service		A	
Analysis Period (min)	15				

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	11	2	24	3	3	6	13	23	11	2	29	18
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	11	2	24	3	3	6	13	23	11	2	29	18
Pedestrians		22			21			2			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			2			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	128	145	62	144	148	52	69			55		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	128	145	62	144	148	52	69			55		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	98	100	100	99	99			100		
cM capacity (veh/h)	797	716	988	765	713	1003	1516			1536		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	37	12	47	49
Volume Left	11	3	13	2
Volume Right	24	6	11	18
cSH	905	850	1516	1536
Volume to Capacity	0.04	0.01	0.01	0.00
Queue Length 95th (ft)	3	1	1	0
Control Delay (s)	9.1	9.3	2.1	0.3
Lane LOS	A	A	A	A
Approach Delay (s)	9.1	9.3	2.1	0.3
Approach LOS	A	A		

Intersection Summary				
Average Delay	3.9			
Intersection Capacity Utilization	21.5%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	38	80	100	82	82	241	50	56	1474	109	25	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.97			1.00	0.98		1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00			0.98	1.00		1.00	1.00			1.00
Frt	1.00	0.92			1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00			0.98	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1775	1668			1788	1544		1787	5070			1787
Flt Permitted	0.60	1.00			0.71	1.00		0.95	1.00			0.95
Satd. Flow (perm)	1127	1668			1297	1544		1787	5070			1787
Peak-hour factor, PHF	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. Flow (vph)	38	80	100	82	82	241	50	56	1474	109	25	93
RTOR Reduction (vph)	0	57	0	0	0	180	0	0	8	0	0	0
Lane Group Flow (vph)	38	123	0	0	164	61	0	106	1575	0	0	118
Confl. Peds. (#/hr)	10		49	49		10				7		
Confl. Bikes (#/hr)			6			5				1		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	22.7	22.7			22.7	22.7		7.2	41.3			12.5
Effective Green, g (s)	22.7	22.7			22.7	22.7		7.2	41.3			12.5
Actuated g/C Ratio	0.25	0.25			0.25	0.25		0.08	0.46			0.14
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	284	420			327	389		142	2326			248
v/s Ratio Prot		0.07						0.06	c0.31			0.07
v/s Ratio Perm	0.03				c0.13	0.04						
v/c Ratio	0.13	0.29			0.50	0.16		0.75	0.68			0.48
Uniform Delay, d1	26.0	27.2			28.8	26.2		40.5	19.1			35.7
Progression Factor	1.00	1.00			1.00	1.00		0.99	1.06			0.77
Incremental Delay, d2	0.1	0.1			0.4	0.1		8.1	0.7			0.5
Delay (s)	26.1	27.3			29.2	26.3		48.4	21.0			27.9
Level of Service	C	C			C	C		D	C			C
Approach Delay (s)		27.1			27.5				22.7			
Approach LOS		C			C				C			

Intersection Summary				
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		14.0
Intersection Capacity Utilization	94.9%	ICU Level of Service		F
Analysis Period (min)	15			

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1477	0
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5136	
Flt Permitted	1.00	
Satd. Flow (perm)	5136	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1477	0
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1477	0
Confl. Peds. (#/hr)		10
Confl. Bikes (#/hr)		10
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	46.1	
Effective Green, g (s)	46.1	
Actuated g/C Ratio	0.51	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2630	
v/s Ratio Prot	c0.29	
v/s Ratio Perm		
v/c Ratio	0.56	
Uniform Delay, d1	15.0	
Progression Factor	0.75	
Incremental Delay, d2	0.8	
Delay (s)	12.0	
Level of Service	B	
Approach Delay (s)	13.2	
Approach LOS	B	

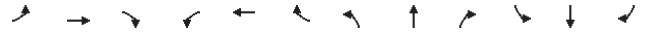
Intersection Summary			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	274	4	3	385	2	7	3	5	0	2	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.95			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.95			0.88	
Flt Protected		1.00			1.00			0.98			1.00	
Satd. Flow (prot)		1854			1897			1457			1655	
Flt Permitted		1.00			1.00			0.95			1.00	
Satd. Flow (perm)		1848			1894			1418			1655	
Peak-hour factor, PHF	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. Flow (vph)	4	274	4	3	385	2	7	3	5	0	2	15
RTOR Reduction (vph)	0	1	0	0	1	0	0	3	0	0	8	0
Lane Group Flow (vph)	0	281	0	0	389	0	0	12	0	0	9	0
Confl. Peds. (#/hr)	17		55	55		17			202	202		
Confl. Bikes (#/hr)			6			5						1
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		21.0			21.0			23.0			23.0	
Effective Green, g (s)		21.0			21.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.42			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		776			795			652			761	
v/s Ratio Prot											0.01	
v/s Ratio Perm		0.15			c0.21			c0.01				
v/c Ratio		0.36			0.49			0.02			0.01	
Uniform Delay, d1		9.9			10.6			7.4			7.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.3			2.2			0.1			0.0	
Delay (s)		11.2			12.7			7.4			7.4	
Level of Service		B			B			A			A	
Approach Delay (s)		11.2			12.7			7.4			7.4	
Approach LOS		B			B			A			A	

Intersection Summary					
HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.24				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	6.0		
Intersection Capacity Utilization	47.9%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
12: 52nd Street & Dover Street

Children's Hospital
Existing AM Plus Phase 2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	184	73	42	326	27	36	2	26	35	6	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	19	184	73	42	326	27	36	2	26	35	6	25
Pedestrians		20			10			12			23	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			1			1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.88			0.91			0.93	0.93	0.91	0.93	0.93	0.88
vC, conflicting volume	376			269			742	730	242	742	754	382
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	229			146			465	452	117	465	477	237
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	98			97			91	100	97	92	99	96
cM capacity (veh/h)	1156			1298			402	422	816	420	421	689

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	276	395	64	66
Volume Left	19	42	36	35
Volume Right	73	27	26	25
cSH	1156	1298	508	493
Volume to Capacity	0.02	0.03	0.13	0.13
Queue Length 95th (ft)	1	3	11	11
Control Delay (s)	0.7	1.1	13.1	13.4
Lane LOS	A	A	B	B
Approach Delay (s)	0.7	1.1	13.1	13.4
Approach LOS			B	B

Intersection Summary				
Average Delay	3.0			
Intersection Capacity Utilization	47.2%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
13: SR-24 NB Off-Ramp & 52nd Street

Children's Hospital
Existing AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	237	0	0	399	1076	0	898	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	237	0	0	399	1076	0	898	0	0
Pedestrians							24			
Lane Width (ft)							12.0			
Walking Speed (ft/s)							4.0			
Percent Blockage							2			
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.82						0.82		0.82	0.82
vC, conflicting volume	1475			261			1736	142	1416	660
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1150			261			1467	142	1078	162
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	497			1274			102	859	0	589

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	118	118	266	492	717	449	449
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	359	717	449	449
cSH	1700	1700	1700	1700	1700	859	859
Volume to Capacity	0.07	0.07	0.16	0.29	0.42	0.52	0.52
Queue Length 95th (ft)	0	0	0	0	0	78	78
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	13.7	13.7
Lane LOS						B	B
Approach Delay (s)	0.0		0.0			13.7	
Approach LOS						B	

Intersection Summary				
Average Delay	4.7			
Intersection Capacity Utilization	48.4%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	40	286	696	148	24	897	82	154	123	30	96	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.99		1.00	1.00		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.97		1.00	0.99		1.00	0.97			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.98
Satd. Flow (prot)		1787	4947		1805	5107		1752	1781			1734
Flt Permitted		0.95	1.00		0.95	1.00		0.44	1.00			0.80
Satd. Flow (perm)		1787	4947		1805	5107		809	1781			1410
Peak-hour factor, PHF	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. Flow (vph)	40	286	696	148	24	897	82	154	123	30	96	136
RTOR Reduction (vph)	0	0	30	0	0	12	0	0	10	0	0	0
Lane Group Flow (vph)	0	326	814	0	24	967	0	154	143	0	0	232
Confl. Peds. (#/hr)				12			5			10	10	
Confl. Bikes (#/hr)				12			1			10		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		21.5	37.7		3.2	19.4		35.1	35.1			24.6
Effective Green, g (s)		21.5	37.7		3.2	19.4		35.1	35.1			24.6
Actuated g/C Ratio		0.24	0.42		0.04	0.22		0.39	0.39			0.27
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		426	2072		64	1100		383	694			385
v/s Ratio Prot		c0.18	0.16		0.01	c0.19		c0.03	0.08			
v/s Ratio Perm								0.13				c0.16
v/c Ratio		0.77	0.39		0.38	0.88		0.40	0.21			0.60
Uniform Delay, d1		31.9	18.2		42.4	34.2		18.8	18.2			28.4
Progression Factor		1.00	1.00		1.22	0.84		1.00	1.00			1.00
Incremental Delay, d2		12.3	0.6		3.1	8.6		0.7	0.7			6.8
Delay (s)		44.2	18.7		54.6	37.3		19.5	18.9			35.3
Level of Service		D	B		D	D		B	B			D
Approach Delay (s)			25.9			37.7			19.2			30.3
Approach LOS			C			D			B			C

Intersection Summary			
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	101.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	378
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.94
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1419
Flt Permitted	1.00
Satd. Flow (perm)	1419
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	378
RTOR Reduction (vph)	275
Lane Group Flow (vph)	103
Confl. Peds. (#/hr)	16
Confl. Bikes (#/hr)	41
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	24.6
Effective Green, g (s)	24.6
Actuated g/C Ratio	0.27
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	387
v/s Ratio Prot	
v/s Ratio Perm	0.07
v/c Ratio	0.27
Uniform Delay, d1	25.6
Progression Factor	1.00
Incremental Delay, d2	1.7
Delay (s)	27.3
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
15: Telegraph Ave & 52nd Street/Claremont Ave

Children's Hospital
Existing AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	0	6	94	52	154	0	665	117	64	598	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.98		1.00	0.99			0.99		1.00	0.97	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.93		1.00	0.89			0.98		1.00	0.95	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1576		1698	1569			3853		1770	3270	
Flt Permitted		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (perm)		1576		1698	1569			3853		1770	3270	
Peak-hour factor, PHF	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. Flow (vph)	6	0	6	94	52	154	0	665	117	64	598	289
RTOR Reduction (vph)	0	12	0	0	119	0	0	10	0	0	40	0
Lane Group Flow (vph)	0	0	0	85	96	0	0	772	0	64	847	0
Confl. Peds. (#/hr)	4					4	22		18			22
Confl. Bikes (#/hr)			1			2			33			27
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA			NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		1.1		15.4	15.4			48.2		7.3	60.0	
Effective Green, g (s)		1.1		15.4	15.4			48.2		7.3	60.0	
Actuated g/C Ratio		0.01		0.17	0.17			0.54		0.08	0.67	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		19		290	268			2063		143	2180	
v/s Ratio Prot		c0.00		0.05	c0.06			0.20		0.04	c0.26	
v/s Ratio Perm												
v/c Ratio		0.01		0.29	0.36			0.37		0.45	0.39	
Uniform Delay, d1		43.9		32.6	32.9			12.1		39.4	6.7	
Progression Factor		1.00		1.00	1.00			0.97		1.00	1.00	
Incremental Delay, d2		0.1		0.6	0.8			0.5		2.2	0.5	
Delay (s)		44.0		33.1	33.8			12.2		41.7	7.3	
Level of Service		D		C	C			B		D	A	
Approach Delay (s)		44.0			33.6			12.2			9.6	
Approach LOS		D			C			B			A	

Intersection Summary				
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.40			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	70.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
16: Telegraph Ave & 51St Street

Children's Hospital
Existing AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	228	490	71	101	534	238	97	320	58	147	511	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.98		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3414		1787	3350		1719	3324		1752	3447	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3414		1787	3350		1719	3324		1752	3447	
Peak-hour factor, PHF	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. Flow (vph)	228	490	71	101	534	238	97	320	58	147	511	38
RTOR Reduction (vph)	0	12	0	0	55	0	0	16	0	0	5	0
Lane Group Flow (vph)	228	549	0	101	717	0	97	362	0	147	544	0
Confl. Peds. (#/hr)			31			31			30			37
Confl. Bikes (#/hr)			9			7			27			27
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.2	29.0		8.6	26.9		8.6	24.9		11.0	28.3	
Effective Green, g (s)	11.2	29.0		8.6	26.9		8.6	24.9		11.0	28.3	
Actuated g/C Ratio	0.12	0.32		0.10	0.30		0.10	0.28		0.12	0.31	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	423	1100		170	1001		164	919		214	1083	
v/s Ratio Prot	c0.07	c0.16		0.06	c0.21		0.06	0.11		c0.08	c0.16	
v/s Ratio Perm												
v/c Ratio	0.54	0.50		0.59	0.72		0.59	0.39		0.69	0.50	
Uniform Delay, d1	37.0	24.6		39.0	28.1		39.0	26.4		37.8	25.1	
Progression Factor	1.29	0.79		1.00	1.00		1.00	1.00		1.01	0.86	
Incremental Delay, d2	1.2	1.5		5.5	4.4		5.6	1.3		8.4	1.6	
Delay (s)	49.0	21.1		44.5	32.5		44.6	27.7		46.6	23.3	
Level of Service	D	C		D	C		D	C		D	C	
Approach Delay (s)		29.2			33.9			31.2			28.2	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	70.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
17: SB SR-24 On-Ramp & MLK Way & NB SR-24 Off-Ramp

Children's Hospital
Existing AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	151	0	0	0	0	1535	0	0	0	0	1435	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	151	0	0	0	0	1535	0	0	0	0	1435	235
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	151	0	0	0	0	1535	0	0	0	0	1435	235
Confl. Bikes (#/hr)		2										
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	8.0					45.0					29.0	45.0
Effective Green, g (s)	8.0					45.0					29.0	45.0
Actuated g/C Ratio	0.18					1.00					0.64	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	581					1627					2303	2814
v/s Ratio Prot	0.05										0.40	0.08
v/s Ratio Perm						c0.94						
v/c Ratio	0.26					0.94					0.62	0.08
Uniform Delay, d1	15.9					0.0					4.8	0.0
Progression Factor	1.00					1.00					1.72	1.00
Incremental Delay, d2	1.1					12.4					1.1	0.0
Delay (s)	17.0					12.4					9.3	0.0
Level of Service	B					B					A	A
Approach Delay (s)		17.0			12.4			0.0			8.0	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	1.15			
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	50.6%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
18: West Street & 52nd Street

Children's Hospital
Existing AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	162	10	57	74	0	22	0	71	2	43	5
Peak Hour 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
Hourly flow rate (vph)	0	162	10	57	74	0	22	0	71	2	43	5

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	172	131	22	71	50
Volume Left (vph)	0	57	22	0	2
Volume Right (vph)	10	0	0	71	5
Hadj (s)	-0.02	0.12	0.50	-0.70	-0.02
Departure Headway (s)	4.4	4.6	5.8	4.6	4.8
Degree Utilization, x	0.21	0.17	0.04	0.09	0.07
Capacity (veh/h)	792	751	589	736	691
Control Delay (s)	8.5	8.5	7.8	6.8	8.2
Approach Delay (s)	8.5	8.5	7.0		8.2
Approach LOS	A	A	A		A

Intersection Summary				
Delay	8.2			
Level of Service	A			
Intersection Capacity Utilization	36.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	5	147	1	4	79	20	1	0	3	15	0	3
Peak Hour 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
Hourly flow rate (vph)	5	147	1	4	79	20	1	0	3	15	0	3

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	153	103	4	18
Volume Left (vph)	5	4	1	15
Volume Right (vph)	1	20	3	3
Hadj (s)	0.02	-0.11	-0.40	0.07
Departure Headway (s)	4.1	4.0	4.1	4.5
Degree Utilization, x	0.17	0.11	0.00	0.02
Capacity (veh/h)	872	888	824	742
Control Delay (s)	7.9	7.5	7.1	7.6
Approach Delay (s)	7.9	7.5	7.1	7.6
Approach LOS	A	A	A	A

Intersection Summary				
Delay			7.7	
Level of Service			A	
Intersection Capacity Utilization			21.6%	ICU Level of Service
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	354	0	4	312	10	6	11	14	32	12	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	2	354	0	4	312	10	6	11	14	32	12	8
Pedestrians		8			2			10			11	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	333			364			715	709	366	716	704	336
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	333			364			715	709	366	716	704	336
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	97	98	90	97	99
cM capacity (veh/h)	1221			1196			325	353	677	321	353	695

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	356	326	31	52
Volume Left	2	4	6	32
Volume Right	0	10	14	8
cSH	1221	1196	441	358
Volume to Capacity	0.00	0.00	0.07	0.15
Queue Length 95th (ft)	0	0	6	13
Control Delay (s)	0.1	0.1	13.8	16.7
Lane LOS	A	A	B	C
Approach Delay (s)	0.1	0.1	13.8	16.7
Approach LOS			B	C

Intersection Summary				
Average Delay			1.8	
Intersection Capacity Utilization			35.4%	ICU Level of Service
Analysis Period (min)			15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	34	1577	201	0	1605
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	34	1577	201	0	1605
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			154			137
pX, platoon unblocked	0.83	0.76			0.76	
vC, conflicting volume	2212	626			1778	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	561	0			910	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	380	822			564	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	34	631	631	516	535	535	535
Volume Left	0	0	0	0	0	0	0
Volume Right	34	0	0	201	0	0	0
cSH	822	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.04	0.37	0.37	0.30	0.31	0.31	0.31
Queue Length 95th (ft)	3	0	0	0	0	0	0
Control Delay (s)	9.6	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	9.6	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		44.9%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	1686	0	0	1709
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	1686	0	0	1709
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			424			204
pX, platoon unblocked	0.80					
vC, conflicting volume	2256	562			1686	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1705	562			1686	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	66	470			375	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	0	674	674	337	570	570	570
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.40	0.40	0.20	0.34	0.34	0.34
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	0.0	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		36.4%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	12	247	161	49	137	42	22	198	1591	135	86	1298
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.99			0.99			1.00	0.99		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.95			0.98			1.00	0.99		1.00	1.00
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1756			1751			1770	4996		1770	5074
Flt Permitted		0.99			0.70			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1739			1233			1770	4996		1770	5074
Peak-hour factor, PHF	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. Flow (vph)	12	247	161	49	137	42	22	198	1591	135	86	1298
RTOR Reduction (vph)	0	24	0	0	9	0	0	0	8	0	0	1
Lane Group Flow (vph)	0	396	0	0	219	0	0	220	1718	0	86	1311
Confl. Peds. (#/hr)	11		15	15		11		12		20	20	
Confl. Bikes (#/hr)			16			12				15		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		28.2			28.2			22.4	48.9		8.4	34.9
Effective Green, g (s)		28.2			28.2			22.4	48.9		8.4	34.9
Actuated g/C Ratio		0.28			0.28			0.22	0.49		0.08	0.35
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		490			347			396	2443		148	1770
v/s Ratio Prot								0.12	c0.34		0.05	c0.26
v/s Ratio Perm		c0.23			0.18							
v/c Ratio		0.81			0.63			0.56	0.70		0.58	0.74
Uniform Delay, d1		33.4			31.3			34.4	19.9		44.1	28.6
Progression Factor		1.00			1.00			0.49	0.36		1.00	1.00
Incremental Delay, d2		9.4			3.7			1.5	1.5		5.7	2.8
Delay (s)		42.8			35.0			18.4	8.6		49.8	31.4
Level of Service		D			D			B	A		D	C
Approach Delay (s)		42.8			35.0				9.7			32.5
Approach LOS		D			D				A			C

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	86.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	14
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	14
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	12
Confl. Bikes (#/hr)	15
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	17	438	9	7	174	9	12	12	25	11	9	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	17	438	9	7	174	9	12	12	25	11	9	30
Pedestrians		4			13			7			17	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked				0.95			0.95	0.95	0.95	0.95	0.95	
vC, conflicting volume	200			454			714	698	462	730	698	200
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	200			395			670	652	404	686	652	200
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			96	97	96	96	97	96
cM capacity (veh/h)	1335			1085			321	355	606	301	351	824

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	464	190	49	50
Volume Left	17	7	12	11
Volume Right	9	9	25	30
cSH	1335	1085	436	507
Volume to Capacity	0.01	0.01	0.11	0.10
Queue Length 95th (ft)	1	0	9	8
Control Delay (s)	0.4	0.4	14.3	12.9
Lane LOS	A	A	B	B
Approach Delay (s)	0.4	0.4	14.3	12.9
Approach LOS			B	B

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	44.7%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
Existing PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (vph)	70	343	43	17	135	36	27	523	36	18	530	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.97			0.99			0.99	
Flt Protected		0.99			1.00			1.00			1.00	
Satd. Flow (prot)		1762			1773			1837			1863	
Flt Permitted		0.93			0.95			0.96			0.98	
Satd. Flow (perm)		1644			1698			1774			1824	
Peak-hour factor, PHF	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. Flow (vph)	70	343	43	17	135	36	27	523	36	18	530	24
RTOR Reduction (vph)	0	4	0	0	11	0	0	3	0	0	2	0
Lane Group Flow (vph)	0	452	0	0	177	0	0	583	0	0	570	0
Confl. Peds. (#/hr)	11		11	11		11	19		7	7		19
Confl. Bikes (#/hr)			15			10			31			22
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		29.0			29.0			43.0			43.0	
Effective Green, g (s)		29.0			29.0			43.0			43.0	
Actuated g/C Ratio		0.36			0.36			0.54			0.54	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		595			615			953			980	
v/s Ratio Prot												
v/s Ratio Perm		c0.27			0.10			c0.33			0.31	
v/c Ratio		0.76			0.29			0.61			0.58	
Uniform Delay, d1		22.4			18.2			12.8			12.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		8.8			1.2			2.9			2.5	
Delay (s)		31.2			19.3			15.7			15.0	
Level of Service		C			B			B			B	
Approach Delay (s)		31.2			19.3			15.7			15.0	
Approach LOS		C			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	87.8%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
Existing PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			↑↑↑			↑↑↑	
Volume (vph)	281	20	94	38	14	18	70	899	57	20	930	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			0.99		0.99	1.00		0.99	1.00	
Frt		0.97			0.97		1.00	0.99		1.00	0.99	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1659			1692		1752	3491		1773	3486	
Flt Permitted		0.76			0.77		0.21	1.00		0.23	1.00	
Satd. Flow (perm)		1308			1342		386	3491		438	3486	
Peak-hour factor, PHF	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. Flow (vph)	281	20	94	38	14	18	70	899	57	20	930	98
RTOR Reduction (vph)	0	14	0	0	12	0	0	4	0	0	8	0
Lane Group Flow (vph)	0	381	0	0	58	0	70	952	0	20	1020	0
Confl. Peds. (#/hr)	11		26	26		11	25		17	17		25
Confl. Bikes (#/hr)			8			9			29			45
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		30.7			30.7		50.3	50.3		50.3	50.3	
Effective Green, g (s)		30.7			30.7		50.3	50.3		50.3	50.3	
Actuated g/C Ratio		0.34			0.34		0.56	0.56		0.56	0.56	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		446			457		215	1951		244	1948	
v/s Ratio Prot								0.27			c0.29	
v/s Ratio Perm		c0.29			0.04		0.18			0.05		
v/c Ratio		0.85			0.13		0.33	0.49		0.08	0.52	
Uniform Delay, d1		27.6			20.4		10.7	12.0		9.2	12.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		14.7			0.1		4.0	0.9		0.7	1.0	
Delay (s)		42.3			20.5		14.7	12.9		9.8	13.4	
Level of Service		D			C		B	B		A	B	
Approach Delay (s)		42.3			20.5			13.0			13.3	
Approach LOS		D			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	73.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (veh/h)	4	5	38	14	2	8	11	32	1914	15	6	9
Sign Control		Stop			Stop				Free			
Grade		0%			0%				0%			
Peak Hour 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
Hourly flow rate (vph)	4	5	38	14	2	8	0	32	1914	15	0	9
Pedestrians		5			19				11			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		0			2				1			
Right turn flare (veh)												
Median type									None			
Median storage veh)												
Upstream signal (ft)									299			
pX, platoon unblocked	0.88	0.88	0.78	0.88	0.88	0.80	0.00	0.78			0.00	0.80
vC, conflicting volume	2236	3538	519	2574	3534	664	0	1511			0	1948
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	356	1838	0	740	1833	0	0	649			0	1295
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			0.0	4.1
tC, 2 stage (s)												
tF (s)	*4.3	*4.3	3.3	*4.3	*4.3	*4.3	0.0	2.2			0.0	2.2
p0 queue free %	99	92	95	93	97	99	0	96			0	98
cM capacity (veh/h)	386	60	835	194	61	656	0	721			0	420

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	47	24	510	957	494	384	750	382
Volume Left	4	14	32	0	0	9	0	0
Volume Right	38	8	0	0	15	0	0	7
cSH	339	204	721	1700	1700	420	1700	1700
Volume to Capacity	0.14	0.12	0.04	0.56	0.29	0.02	0.44	0.22
Queue Length 95th (ft)	12	10	3	0	0	2	0	0
Control Delay (s)	17.3	24.9	1.2	0.0	0.0	0.7	0.0	0.0
Lane LOS	C	C	A			A		
Approach Delay (s)	17.3	24.9	0.3			0.2		
Approach LOS	C	C						

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	81.4%	ICU Level of Service	D	
Analysis Period (min)	15			

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
5: MLK Way & 54th Street

Children's Hospital
Existing PM Plus Phase 2

Movement	SBT	SBR
Lane Configurations		
Volume (veh/h)	1499	7
Sign Control	Free	
Grade	0%	
Peak Hour Factor	1.00	1.00
Hourly flow rate (vph)	1499	7
Pedestrians		
Lane Width (ft)		
Walking Speed (ft/s)		
Percent Blockage		
Right turn flare (veh)		
Median type	None	
Median storage veh)		
Upstream signal (ft)	294	
pX, platoon unblocked		
vC, conflicting volume		
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol		
tC, single (s)		
tC, 2 stage (s)		
tF (s)		
p0 queue free %		
cM capacity (veh/h)		

Direction, Lane #

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	10	4	2	5	11	8	34	4	7	18	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	8	10	4	2	5	11	8	34	4	7	18	2
Pedestrians		12			8			6			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	114	107	37	108	106	47	32			46		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	114	107	37	108	106	47	32			46		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	100	100	99	99	99			100		
cM capacity (veh/h)	827	766	1025	837	767	1019	1577			1564		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	22	18	46	27
Volume Left	8	2	8	7
Volume Right	4	11	4	2
cSH	827	913	1577	1564
Volume to Capacity	0.03	0.02	0.01	0.00
Queue Length 95th (ft)	2	2	0	0
Control Delay (s)	9.5	9.0	1.3	1.9
Lane LOS	A	A	A	A
Approach Delay (s)	9.5	9.0	1.3	1.9
Approach LOS	A	A		

Intersection Summary				
Average Delay	4.3			
Intersection Capacity Utilization	18.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	3	14	11	604	615	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	3	14	11	604	615	3
Pedestrians	25				1	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	2				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.83	0.79	0.79			
vC, conflicting volume	1268	642	643			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1007	417	419			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	97	99			
cM capacity (veh/h)	217	497	885			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	17	615	618
Volume Left	3	11	0
Volume Right	14	0	3
cSH	404	885	1700
Volume to Capacity	0.04	0.01	0.36
Queue Length 95th (ft)	3	1	0
Control Delay (s)	14.3	0.3	0.0
Lane LOS	B	A	
Approach Delay (s)	14.3	0.3	0.0
Approach LOS	B		

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	50.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	2	5	46	23	6	6	7	9	1973	48	12	1568
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.88			0.98			1.00	1.00		1.00	1.00
Flt Protected		1.00			0.97			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1612			1787			1770	5053		1787	5133
Flt Permitted		0.99			0.82			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1603			1509			1770	5053		1787	5133
Peak-hour factor, PHF	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. Flow (vph)	2	5	46	23	6	6	7	9	1973	48	12	1568
RTOR Reduction (vph)	0	39	0	0	5	0	0	0	2	0	0	0
Lane Group Flow (vph)	0	14	0	0	30	0	0	16	2019	0	12	1572
Confl. Peds. (#/hr)	8		4	4		8		14		32	32	
Confl. Bikes (#/hr)			4			2				13		
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		15.9			15.9			3.0	69.8		1.8	68.6
Effective Green, g (s)		15.9			15.9			3.0	69.8		1.8	68.6
Actuated g/C Ratio		0.16			0.16			0.03	0.70		0.02	0.69
Clearance Time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		254			239			53	3526		32	3521
v/s Ratio Prot								0.01	c0.40		0.01	c0.31
v/s Ratio Perm		0.01			c0.02							
v/c Ratio		0.06			0.13			0.30	0.57		0.38	0.45
Uniform Delay, d1		35.7			36.1			47.5	7.6		48.5	7.1
Progression Factor		1.00			1.02			1.45	0.19		0.77	0.46
Incremental Delay, d2		0.1			0.2			2.2	0.5		5.4	0.3
Delay (s)		35.8			37.0			71.0	1.9		42.9	3.6
Level of Service		D			D			E	A		D	A
Approach Delay (s)		35.8			37.0				2.5			3.9
Approach LOS		D			D				A			A

Intersection Summary			
HCM 2000 Control Delay	3.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: MLK Way & 53rd Street

Children's Hospital
Existing PM Plus Phase 2

Movement	SBR
Lane Configurations	
Volume (vph)	4
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	4
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	14
Confl. Bikes (#/hr)	16
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis
9: Dover Street & 53rd Street

Children's Hospital
Existing PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	11	2	50	3	3	5	8	33	6	1	21	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	11	2	50	3	3	5	8	33	6	1	21	8
Pedestrians		25			10			4			4	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			1			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	114	117	54	144	118	50	54			49		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	114	117	54	144	118	50	54			49		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	95	100	100	100	99			100		
cM capacity (veh/h)	817	750	994	757	749	1012	1532			1558		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	63	11	47	30
Volume Left	11	3	8	1
Volume Right	50	5	6	8
cSH	949	852	1532	1558
Volume to Capacity	0.07	0.01	0.01	0.00
Queue Length 95th (ft)	5	1	0	0
Control Delay (s)	9.1	9.3	1.3	0.2
Lane LOS	A	A	A	A
Approach Delay (s)	9.1	9.3	1.3	0.2
Approach LOS	A	A		

Intersection Summary				
Average Delay		4.9		
Intersection Capacity Utilization		21.5%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
10: MLK Way & 52nd Street

Children's Hospital
Existing PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	66	118	95	158	87	218	42	74	1676	111	3	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.97			1.00	0.97		1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00			0.97	1.00		1.00	1.00			1.00
Frt	1.00	0.93			1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00			0.97	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1770	1695			1757	1535		1787	5069			1787
Flt Permitted	0.46	1.00			0.56	1.00		0.95	1.00			0.95
Satd. Flow (perm)	853	1695			1014	1535		1787	5069			1787
Peak-hour factor, PHF	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. Flow (vph)	66	118	95	158	87	218	42	74	1676	111	3	144
RTOR Reduction (vph)	0	31	0	0	0	160	0	0	7	0	0	0
Lane Group Flow (vph)	66	182	0	0	245	58	0	116	1780	0	0	147
Confl. Peds. (#/hr)	16		61	61		16		13		10		10
Confl. Bikes (#/hr)			9			4				15		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	26.7	26.7			26.7	26.7		10.8	42.3			17.5
Effective Green, g (s)	26.7	26.7			26.7	26.7		10.8	42.3			17.5
Actuated g/C Ratio	0.27	0.27			0.27	0.27		0.11	0.42			0.18
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	227	452			270	409		192	2144			312
v/s Ratio Prot		0.11						0.06	c0.35			0.08
v/s Ratio Perm	0.08				c0.24	0.04						
v/c Ratio	0.29	0.40			0.91	0.14		0.60	0.83			0.47
Uniform Delay, d1	29.1	30.1			35.5	27.9		42.6	25.7			37.1
Progression Factor	1.00	1.00			1.22	3.22		0.96	1.06			0.57
Incremental Delay, d2	0.3	0.2			29.4	0.1		1.5	1.7			0.4
Delay (s)	29.4	30.3			72.6	89.9		42.6	28.8			21.6
Level of Service	C	C			E	F		D	C			C
Approach Delay (s)		30.1			80.8				29.7			
Approach LOS		C			F				C			

Intersection Summary				
HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	102.3%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1505	1
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5135	
Flt Permitted	1.00	
Satd. Flow (perm)	5135	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1505	1
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1506	0
Confl. Peds. (#/hr)		13
Confl. Bikes (#/hr)		17
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	48.5	
Effective Green, g (s)	48.5	
Actuated g/C Ratio	0.48	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2490	
v/s Ratio Prot	c0.29	
v/s Ratio Perm		
v/c Ratio	0.60	
Uniform Delay, d1	18.8	
Progression Factor	0.26	
Incremental Delay, d2	1.0	
Delay (s)	5.8	
Level of Service	A	
Approach Delay (s)	7.2	
Approach LOS	A	

Intersection Summary			
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	371	2	5	398	2	12	1	7	0	4	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.94			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.95			0.87	
Flt Protected		1.00			1.00			0.97			1.00	
Satd. Flow (prot)		1859			1896			1428			1640	
Flt Permitted		1.00			1.00			0.91			1.00	
Satd. Flow (perm)		1856			1890			1343			1640	
Peak-hour factor, PHF	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. Flow (vph)	3	371	2	5	398	2	12	1	7	0	4	59
RTOR Reduction (vph)	0	1	0	0	1	0	0	4	0	0	35	0
Lane Group Flow (vph)	0	375	0	0	404	0	0	16	0	0	28	0
Confl. Peds. (#/hr)	25		59	59		25			208	208		
Confl. Bikes (#/hr)			10			6						1
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		24.0			24.0			20.0			20.0	
Effective Green, g (s)		24.0			24.0			20.0			20.0	
Actuated g/C Ratio		0.48			0.48			0.40			0.40	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		890			907			537			656	
v/s Ratio Prot											c0.02	
v/s Ratio Perm		0.20			c0.21			0.01				
v/c Ratio		0.42			0.45			0.03			0.04	
Uniform Delay, d1		8.5			8.6			9.1			9.2	
Progression Factor		0.97			1.00			1.00			1.00	
Incremental Delay, d2		1.2			1.6			0.1			0.1	
Delay (s)		9.4			10.2			9.2			9.3	
Level of Service		A			B			A			A	
Approach Delay (s)		9.4			10.2			9.2			9.3	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
12: 52nd Street & Dover Street

Children's Hospital
Existing PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	313	45	20	322	26	70	5	47	57	2	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	18	313	45	20	322	26	70	5	47	57	2	21
Pedestrians		37			7			35			15	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			1			3			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.90			0.87			0.92	0.92	0.87	0.92	0.92	0.90
vC, conflicting volume	363			393			840	810	378	818	819	387
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	232			229			533	499	211	508	510	258
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	98			98			80	99	93	85	100	97
cM capacity (veh/h)	1178			1137			352	395	680	377	402	674

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	376	368	122	80
Volume Left	18	20	70	57
Volume Right	45	26	47	21
cSH	1178	1137	435	427
Volume to Capacity	0.02	0.02	0.28	0.19
Queue Length 95th (ft)	1	1	28	17
Control Delay (s)	0.5	0.6	16.5	15.4
Lane LOS	A	A	C	C
Approach Delay (s)	0.5	0.6	16.5	15.4
Approach LOS			C	C

Intersection Summary				
Average Delay	3.9			
Intersection Capacity Utilization	43.8%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
13: SR-24 NB Off-Ramp & 52nd Street

Children's Hospital
Existing PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	414	0	0	375	996	0	1024	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	414	0	0	375	996	0	1024	0	0
Pedestrians							33		9	
Lane Width (ft)							12.0		0.0	
Walking Speed (ft/s)							4.0		4.0	
Percent Blockage							3		0	
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.83						0.83		0.83	0.83
vC, conflicting volume	1380			447			1827	240	1615	831
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1058			447			1594	240	1339	399
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	546			1079			86	737	0	436

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	207	207	250	457	664	512	512
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	332	664	512	512
cSH	1700	1700	1700	1700	1700	737	737
Volume to Capacity	0.12	0.12	0.15	0.27	0.39	0.69	0.69
Queue Length 95th (ft)	0	0	0	0	0	142	142
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	20.2	20.2
Lane LOS						C	C
Approach Delay (s)	0.0		0.0			20.2	
Approach LOS						C	

Intersection Summary				
Average Delay	7.4			
Intersection Capacity Utilization	55.2%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	40	305	901	172	35	839	129	146	207	40	140	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.99		1.00	0.99		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			0.99
Frt		1.00	0.98		1.00	0.98		1.00	0.98			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.98
Satd. Flow (prot)		1787	4953		1805	5038		1747	1783			1716
Flt Permitted		0.95	1.00		0.95	1.00		0.30	1.00			0.72
Satd. Flow (perm)		1787	4953		1805	5038		554	1783			1268
Peak-hour factor, PHF	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. Flow (vph)	40	305	901	172	35	839	129	146	207	40	140	143
RTOR Reduction (vph)	0	0	24	0	0	18	0	0	6	0	0	0
Lane Group Flow (vph)	0	345	1049	0	35	950	0	146	241	0	0	283
Confl. Peds. (#/hr)		11		14	14		11	18		22	22	
Confl. Bikes (#/hr)				13			8			30		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		33.5	57.2		3.9	27.6		34.9	34.9			25.4
Effective Green, g (s)		33.5	57.2		3.9	27.6		34.9	34.9			25.4
Actuated g/C Ratio		0.30	0.52		0.04	0.25		0.32	0.32			0.23
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		544	2575		63	1264		235	565			292
v/s Ratio Prot		c0.19	0.21		0.02	c0.19		c0.03	0.14			
v/s Ratio Perm								0.17				c0.22
v/c Ratio		0.63	0.41		0.56	0.75		0.62	0.43			0.97
Uniform Delay, d1		33.0	16.1		52.2	38.0		31.3	29.6			41.9
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Incremental Delay, d2		5.5	0.5		10.2	4.2		5.0	2.3			45.4
Delay (s)		38.5	16.6		62.4	42.2		36.4	32.0			87.3
Level of Service		D	B		E	D		D	C			F
Approach Delay (s)			21.9			42.9			33.6			59.2
Approach LOS			C			D			C			E

Intersection Summary			
HCM 2000 Control Delay	36.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	100.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: 52nd Street & Shattuck Ave

Children's Hospital
Existing PM Plus Phase 2

Movement	SBR
Lane Configurations	
Volume (vph)	347
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.94
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1421
Flt Permitted	1.00
Satd. Flow (perm)	1421
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	347
RTOR Reduction (vph)	267
Lane Group Flow (vph)	80
Confl. Peds. (#/hr)	18
Confl. Bikes (#/hr)	27
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	25.4
Effective Green, g (s)	25.4
Actuated g/C Ratio	0.23
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	328
v/s Ratio Prot	
v/s Ratio Perm	0.06
v/c Ratio	0.24
Uniform Delay, d1	34.5
Progression Factor	1.00
Incremental Delay, d2	1.8
Delay (s)	36.2
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

Children's Hospital 8:00 am 11/12/2013 Existing PM Plus Phase 2 Synchro 8 Report

HCM Signalized Intersection Capacity Analysis
15: Telegraph Ave & 52nd Street/Claremont Ave

Children's Hospital
Existing PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	13	7	13	99	72	157	14	861	224	101	667	286
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.95			0.99		1.00	0.93	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.95		1.00	0.90			0.97		1.00	0.95	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1623		1698	1532			3797		1770	3144	
Flt Permitted		0.98		0.95	1.00			0.94		0.95	1.00	
Satd. Flow (perm)		1623		1698	1532			3564		1770	3144	
Peak-hour factor, PHF	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. Flow (vph)	13	7	13	99	72	157	14	861	224	101	667	286
RTOR Reduction (vph)	0	12	0	0	74	0	0	18	0	0	37	0
Lane Group Flow (vph)	0	21	0	89	165	0	0	1081	0	101	916	0
Confl. Peds. (#/hr)	34					34	70		22	22		70
Confl. Bikes (#/hr)			1			10			35			48
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		4.6		16.9	16.9			51.2		9.3	65.0	
Effective Green, g (s)		4.6		16.9	16.9			51.2		9.3	65.0	
Actuated g/C Ratio		0.05		0.17	0.17			0.51		0.09	0.65	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		74		286	258			1824		164	2043	
v/s Ratio Prot		c0.01		0.05	c0.11					c0.06	0.29	
v/s Ratio Perm								c0.30				
v/c Ratio		0.28		0.31	0.64			0.59		0.62	0.45	
Uniform Delay, d1		46.1		36.4	38.7			17.1		43.6	8.6	
Progression Factor		1.87		1.00	1.00			0.60		1.00	1.00	
Incremental Delay, d2		1.2		0.6	5.1			1.1		6.7	0.7	
Delay (s)		87.3		37.1	43.9			11.4		50.3	9.4	
Level of Service		F		D	D			B		D	A	
Approach Delay (s)		87.3			42.0			11.4			13.3	
Approach LOS		F			D			B			B	

Intersection Summary				
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	88.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
16: Telegraph Ave & 51St Street

Children's Hospital
Existing PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	324	611	92	56	478	229	81	574	97	262	476	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.97		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3396		1787	3314		1719	3311		1752	3401	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3396		1787	3314		1719	3311		1752	3401	
Peak-hour factor, PHF	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. Flow (vph)	324	611	92	56	478	229	81	574	97	262	476	44
RTOR Reduction (vph)	0	11	0	0	57	0	0	13	0	0	7	0
Lane Group Flow (vph)	324	692	0	56	650	0	81	658	0	262	513	0
Confl. Peds. (#/hr)	38		52	52		38	92		57	57		92
Confl. Bikes (#/hr)			8			15			34			54
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.4	29.8		7.4	23.3		7.5	33.3		13.0	39.8	
Effective Green, g (s)	14.4	29.8		7.4	23.3		7.5	33.3		13.0	39.8	
Actuated g/C Ratio	0.14	0.30		0.07	0.23		0.08	0.33		0.13	0.40	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	489	1012		132	772		128	1102		227	1353	
v/s Ratio Prot	c0.10	0.20		0.03	c0.20		0.05	c0.20		c0.15	0.15	
v/s Ratio Perm												
v/c Ratio	0.66	0.68		0.42	0.84		0.63	0.60		1.15	0.38	
Uniform Delay, d1	40.5	30.9		44.3	36.6		44.9	27.8		43.5	21.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.18	0.74	
Incremental Delay, d2	3.4	3.7		2.2	10.8		9.8	2.4		105.5	0.8	
Delay (s)	43.9	34.7		46.5	47.4		54.7	30.1		156.6	16.6	
Level of Service	D	C		D	D		D	C		F	B	
Approach Delay (s)		37.6			47.3			32.8			63.5	
Approach LOS		D			D			C			E	

Intersection Summary				
HCM 2000 Control Delay	44.8	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	78.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	269	0	0	0	0	1626	0	0	0	0	1589	238
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	269	0	0	0	0	1626	0	0	0	0	1589	238
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	269	0	0	0	0	1626	0	0	0	0	1589	238
Confl. Peds. (#/hr)			2	2			18					18
Confl. Bikes (#/hr)									9			12
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	13.0					50.0					29.0	50.0
Effective Green, g (s)	13.0					50.0					29.0	50.0
Actuated g/C Ratio	0.26					1.00					0.58	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	850					1627					2072	2814
v/s Ratio Prot	0.08										0.44	0.08
v/s Ratio Perm						c1.00						
v/c Ratio	0.32					1.00					0.77	0.08
Uniform Delay, d1	14.9					0.0					7.9	0.0
Progression Factor	1.00					1.00					2.70	1.00
Incremental Delay, d2	1.0					22.2					2.3	0.0
Delay (s)	15.9					22.2					23.7	0.0
Level of Service	B					C					C	A
Approach Delay (s)		15.9			22.2			0.0			20.6	
Approach LOS		B			C			A			C	

Intersection Summary				
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	1.19			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	58.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	113	8	83	97	0	43	0	134	6	52	4
Peak Hour 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
Hourly flow rate (vph)	0	113	8	83	97	0	43	0	134	6	52	4

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	121	180	43	134	62
Volume Left (vph)	0	83	43	0	6
Volume Right (vph)	8	0	0	134	4
Hadj (s)	-0.02	0.13	0.50	-0.70	0.01
Departure Headway (s)	4.7	4.8	5.8	4.6	5.0
Degree Utilization, x	0.16	0.24	0.07	0.17	0.09
Capacity (veh/h)	716	715	587	733	665
Control Delay (s)	8.6	9.2	8.0	7.4	8.5
Approach Delay (s)	8.6	9.2	7.5		8.5
Approach LOS	A	A	A		A

Intersection Summary				
Delay	8.4			
Level of Service	A			
Intersection Capacity Utilization	40.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	1	111	2	2	100	36	2	0	3	11	0	3
Peak Hour 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
Hourly flow rate (vph)	1	111	2	2	100	36	2	0	3	11	0	3

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	114	138	5	14
Volume Left (vph)	1	2	2	11
Volume Right (vph)	2	36	3	3
Hadj (s)	0.01	-0.15	-0.28	0.03
Departure Headway (s)	4.1	3.9	4.2	4.5
Degree Utilization, x	0.13	0.15	0.01	0.02
Capacity (veh/h)	869	911	806	751
Control Delay (s)	7.7	7.6	7.2	7.5
Approach Delay (s)	7.7	7.6	7.2	7.5
Approach LOS	A	A	A	A

Intersection Summary				
Delay			7.6	
Level of Service			A	
Intersection Capacity Utilization			20.4%	ICU Level of Service
Analysis Period (min)			15	
				A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (veh/h)	12	370	1	10	339	29	8	18	29	27	3	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	12	370	1	10	339	29	8	18	29	27	3	10
Pedestrians		5						7			3	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	371			378			792	792	378	809	778	362
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	371			378			792	792	378	809	778	362
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			97	94	96	90	99	99
cM capacity (veh/h)	1190			1185			294	315	670	267	319	679

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	383	378	55	40
Volume Left	12	10	8	27
Volume Right	1	29	29	10
cSH	1190	1185	431	320
Volume to Capacity	0.01	0.01	0.13	0.13
Queue Length 95th (ft)	1	1	11	11
Control Delay (s)	0.4	0.3	14.6	17.9
Lane LOS	A	A	B	C
Approach Delay (s)	0.4	0.3	14.6	17.9
Approach LOS			B	C

Intersection Summary				
Average Delay			2.1	
Intersection Capacity Utilization			40.3%	ICU Level of Service
Analysis Period (min)			15	
				A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	123	1929	34	0	1644
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	123	1929	34	0	1644
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			154			137
pX, platoon unblocked	0.76	0.69			0.69	
vC, conflicting volume	2494	660			1963	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	614	0			812	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	84			100	
cM capacity (veh/h)	321	746			557	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	123	772	772	420	548	548	548
Volume Left	0	0	0	0	0	0	0
Volume Right	123	0	0	34	0	0	0
cSH	746	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.16	0.45	0.45	0.25	0.32	0.32	0.32
Queue Length 95th (ft)	15	0	0	0	0	0	0
Control Delay (s)	10.8	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	10.8	0.0			0.0		
Approach LOS	B						

Intersection Summary				
Average Delay		0.4		
Intersection Capacity Utilization		52.3%	ICU Level of Service	A
Analysis Period (min)		15		

Appendix H

LOS Calculation Worksheets – 2020 Plus Phase 1 Conditions

FEHR PEERS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	20	180	230	60	240	80	21	150	1381	70	90	1332
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			0.99			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.93			0.97			1.00	0.99		1.00	0.99
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1703			1747			1770	5028		1770	5046
Flt Permitted		0.98			0.77			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1664			1360			1770	5028		1770	5046
Peak-hour factor, PHF	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. Flow (vph)	20	180	230	60	240	80	21	150	1381	70	90	1332
RTOR Reduction (vph)	0	52	0	0	12	0	0	0	5	0	0	4
Lane Group Flow (vph)	0	378	0	0	368	0	0	171	1446	0	90	1378
Confl. Peds. (#/hr)	10		19	19		10				28		
Confl. Bikes (#/hr)			21			20				8		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		27.7			27.7			14.4	41.8		6.0	33.4
Effective Green, g (s)		27.7			27.7			14.4	41.8		6.0	33.4
Actuated g/C Ratio		0.31			0.31			0.16	0.46		0.07	0.37
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		512			418			283	2335		118	1872
v/s Ratio Prot								0.10	c0.29		0.05	c0.27
v/s Ratio Perm		0.23			c0.27							
v/c Ratio		0.74			0.88			0.60	0.62		0.76	0.74
Uniform Delay, d1		27.9			29.6			35.2	18.1		41.3	24.5
Progression Factor		1.00			1.00			0.54	0.22		1.00	1.00
Incremental Delay, d2		5.5			19.0			3.3	1.1		24.8	2.6
Delay (s)		33.4			48.6			22.2	5.0		66.1	27.1
Level of Service		C			D			C	A		E	C
Approach Delay (s)		33.4			48.6				6.8			29.5
Approach LOS		C			D				A			C

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	90.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: MLK Way & 55th Street

Children's Hospital
2020 AM Plus Phase 1

Movement	SBR
Lane Configurations	
Volume (vph)	50
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	50
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	16
Confl. Bikes (#/hr)	10
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis
2: Dover Street & 55th Street

Children's Hospital
2020 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	300	10	30	320	10	10	10	20	10	10	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	300	10	30	320	10	10	10	20	10	10	30
Pedestrians		12			26			20			8	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			2			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked	0.89						0.89	0.89		0.89	0.89	0.89
vC, conflicting volume	338			330			817	783	351	809	783	345
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	196			330			733	695	351	724	695	204
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			97			96	97	97	96	97	96
cM capacity (veh/h)	1203			1198			260	305	671	263	302	731

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	340	360	40	50
Volume Left	30	30	10	10
Volume Right	10	10	20	30
cSH	1203	1198	395	445
Volume to Capacity	0.02	0.03	0.10	0.11
Queue Length 95th (ft)	2	2	8	9
Control Delay (s)	0.9	0.9	15.1	14.1
Lane LOS	A	A	C	B
Approach Delay (s)	0.9	0.9	15.1	14.1
Approach LOS			C	B

Intersection Summary				
Average Delay			2.5	
Intersection Capacity Utilization			41.1%	ICU Level of Service
Analysis Period (min)			15	

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
2020 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	230	60	30	270	50	40	460	30	30	570	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.99			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.99			0.99	
Flt Protected		0.99			1.00			1.00			1.00	
Satd. Flow (prot)		1727			1787			1836			1855	
Flt Permitted		0.86			0.96			0.93			0.96	
Satd. Flow (perm)		1491			1719			1710			1792	
Peak-hour factor, PHF	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. Flow (vph)	60	230	60	30	270	50	40	460	30	30	570	40
RTOR Reduction (vph)	0	10	0	0	8	0	0	3	0	0	3	0
Lane Group Flow (vph)	0	340	0	0	342	0	0	527	0	0	637	0
Confl. Peds. (#/hr)	8		17	17		8	10		23	23		10
Confl. Bikes (#/hr)			29			13			17			32
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		25.0			25.0			47.0			47.0	
Effective Green, g (s)		25.0			25.0			47.0			47.0	
Actuated g/C Ratio		0.31			0.31			0.59			0.59	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		465			537			1004			1052	
v/s Ratio Prot												
v/s Ratio Perm		c0.23			0.20			0.31			c0.36	
v/c Ratio		0.73			0.64			0.53			0.61	
Uniform Delay, d1		24.5			23.6			9.8			10.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		9.8			5.7			2.0			2.6	
Delay (s)		34.3			29.3			11.8			13.2	
Level of Service		C			C			B			B	
Approach Delay (s)		34.3			29.3			11.8			13.2	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM 2000 Control Delay		19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio		0.65		
Actuated Cycle Length (s)		80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization		80.7%	ICU Level of Service	D
Analysis Period (min)		15		
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
2020 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	20	90	40	10	10	70	842	50	40	984	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	0.99		1.00	0.98	
Flpb, ped/bikes		1.00			0.99		1.00	1.00		0.99	1.00	
Frt		0.95			0.98		1.00	0.99		1.00	0.97	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1648			1709		1762	3491		1767	3409	
Flt Permitted		0.78			0.76		0.17	1.00		0.28	1.00	
Satd. Flow (perm)		1330			1338		311	3491		524	3409	
Peak-hour factor, PHF	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. Flow (vph)	160	20	90	40	10	10	70	842	50	40	984	260
RTOR Reduction (vph)	0	30	0	0	7	0	0	5	0	0	27	0
Lane Group Flow (vph)	0	240	0	0	53	0	70	887	0	40	1217	0
Confl. Peds. (#/hr)	8		15	15		8	17		23	23		17
Confl. Bikes (#/hr)			20			20			56			36
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		18.0			18.0		43.0	43.0		43.0	43.0	
Effective Green, g (s)		18.0			18.0		43.0	43.0		43.0	43.0	
Actuated g/C Ratio		0.26			0.26		0.61	0.61		0.61	0.61	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		342			344		191	2144		321	2094	
v/s Ratio Prot								0.25			c0.36	
v/s Ratio Perm		c0.18			0.04		0.23			0.08		
v/c Ratio		0.70			0.15		0.37	0.41		0.12	0.58	
Uniform Delay, d1		23.6			20.1		6.7	7.0		5.6	8.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		6.4			0.2		5.4	0.6		0.8	1.2	
Delay (s)		30.0			20.3		12.1	7.6		6.4	9.3	
Level of Service		C			C		B	A		A	A	
Approach Delay (s)		30.0			20.3			7.9			9.2	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	69.3%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
5: MLK Way & 54th Street

Children's Hospital
2020 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	10	10	50	10	10	10	10	20	1572	20	20	1593
Sign Control		Stop			Stop				Free			Free
Grade		0%			0%				0%			0%
Peak Hour 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
Hourly flow rate (vph)	10	10	50	10	10	10	0	20	1572	20	20	1593
Pedestrians		10			8				11			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		1			1				1			
Right turn flare (veh)												
Median type									None			None
Median storage veh)												
Upstream signal (ft)									299			294
pX, platoon unblocked	0.85	0.85	0.77	0.85	0.85	0.83	0.00	0.77			0.83	
vC, conflicting volume	2227	3288	557	2267	3283	542	0	1613			1600	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	508	1752	0	555	1746	0	0	746			1016	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	*5.0	*5.0	*5.0	0.0	2.2			2.2	
p0 queue free %	97	85	94	95	84	98	0	97			96	
cM capacity (veh/h)	312	68	824	214	64	595	0	654			566	

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	70	30	413	786	413	418	796	408
Volume Left	10	10	20	0	0	20	0	0
Volume Right	50	10	0	0	20	0	0	10
cSH	292	137	654	1700	1700	566	1700	1700
Volume to Capacity	0.24	0.22	0.03	0.46	0.24	0.04	0.47	0.24
Queue Length 95th (ft)	23	20	2	0	0	3	0	0
Control Delay (s)	21.2	38.5	0.9	0.0	0.0	1.1	0.0	0.0
Lane LOS	C	E	A			A		
Approach Delay (s)	21.2	38.5	0.2			0.3		
Approach LOS	C	E						

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	66.6%	ICU Level of Service	C	
Analysis Period (min)	15			

* User Entered Value

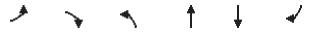
Movement	SBR
Lane Configurations	
Volume (veh/h)	10
Sign Control	
Grade	
Peak Hour Factor	1.00
Hourly flow rate (vph)	10
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	
tC, single (s)	
tC, 2 stage (s)	
tF (s)	
p0 queue free %	
cM capacity (veh/h)	

Direction, Lane #

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	10	10	10	10	10	10	20	20	10	40	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	10	10	10	10	10	10	20	20	10	40	10
Pedestrians		13			19			3			8	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	151	157	61	152	152	57	63			59		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	151	157	61	152	152	57	63			59		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	99	99	99	99	99			99		
cM capacity (veh/h)	767	710	996	765	714	992	1536			1533		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	30	30	50	60
Volume Left	10	10	10	10
Volume Right	10	10	20	10
cSH	807	807	1536	1533
Volume to Capacity	0.04	0.04	0.01	0.01
Queue Length 95th (ft)	3	3	0	0
Control Delay (s)	9.6	9.6	1.5	1.3
Lane LOS	A	A	A	A
Approach Delay (s)	9.6	9.6	1.5	1.3
Approach LOS	A	A		

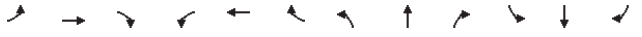
Intersection Summary				
Average Delay	4.3			
Intersection Capacity Utilization	21.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	20	20	520	630	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	20	20	520	630	10
Pedestrians	12			3	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.79	0.79	0.79			
vC, conflicting volume	1209	650	652			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1118	419	422			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	96	98			
cM capacity (veh/h)	176	496	886			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	30	540	640
Volume Left	10	20	0
Volume Right	20	0	10
cSH	309	886	1700
Volume to Capacity	0.10	0.02	0.38
Queue Length 95th (ft)	8	2	0
Control Delay (s)	17.9	0.6	0.0
Lane LOS	C	A	
Approach Delay (s)	17.9	0.6	0.0
Approach LOS	C		

Intersection Summary				
Average Delay		0.7		
Intersection Capacity Utilization		54.5%	ICU Level of Service	A
Analysis Period (min)		15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	40	20	10	20	30	1602	37	20	1653	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.98			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.91			0.95		1.00	1.00		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1653			1742		1770	5060		1787	5128	
Flt Permitted		0.96			0.88		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1595			1569		1770	5060		1787	5128	
Peak-hour factor, PHF	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. Flow (vph)	10	10	40	20	10	20	30	1602	37	20	1653	10
RTOR Reduction (vph)	0	33	0	0	16	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	27	0	0	34	0	30	1638	0	20	1663	0
Confl. Peds. (#/hr)	10		17	17		10			17			26
Confl. Bikes (#/hr)									7			17
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		15.8			15.8		4.5	58.1		3.6	57.2	
Effective Green, g (s)		15.8			15.8		4.5	58.1		3.6	57.2	
Actuated g/C Ratio		0.18			0.18		0.05	0.65		0.04	0.64	
Clearance Time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		280			275		88	3266		71	3259	
v/s Ratio Prot							0.02	c0.32		0.01	c0.32	
v/s Ratio Perm		0.02			c0.02							
v/c Ratio		0.10			0.12		0.34	0.50		0.28	0.51	
Uniform Delay, d1		31.1			31.3		41.3	8.4		41.9	8.8	
Progression Factor		1.00			1.03		1.17	0.46		0.53	0.26	
Incremental Delay, d2		0.2			0.2		1.8	0.4		1.6	0.4	
Delay (s)		31.3			32.3		50.0	4.3		24.0	2.7	
Level of Service		C			C		D	A		C	A	
Approach Delay (s)		31.3			32.3			5.1			2.9	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	4.9	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.44			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5	
Intersection Capacity Utilization	56.9%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
9: Dover Street & 53rd Street

Children's Hospital
2020 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	10	37	10	10	10	20	30	20	10	30	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	20	10	37	10	10	10	20	30	20	10	30	20
Pedestrians		29			28			3			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			2			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	187	207	72	213	207	71	79			78		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	187	207	72	213	207	71	79			78		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	98	96	98	98	99	99			99		
cM capacity (veh/h)	703	648	969	658	648	971	1495			1497		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	67	30	70	60
Volume Left	20	10	20	10
Volume Right	37	10	20	20
cSH	817	733	1495	1497
Volume to Capacity	0.08	0.04	0.01	0.01
Queue Length 95th (ft)	7	3	1	1
Control Delay (s)	9.8	10.1	2.2	1.3
Lane LOS	A	B	A	A
Approach Delay (s)	9.8	10.1	2.2	1.3
Approach LOS	A	B		

Intersection Summary				
Average Delay			5.2	
Intersection Capacity Utilization			23.5%	ICU Level of Service
Analysis Period (min)			15	

HCM Signalized Intersection Capacity Analysis
10: MLK Way & 52nd Street

Children's Hospital
2020 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	48	92	110	82	90	257	60	80	1515	71	33	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.96			1.00	0.97		1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00			0.98	1.00		1.00	1.00			1.00
Frt	1.00	0.92			1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00			0.98	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1772	1659			1785	1537		1787	5095			1787
Flt Permitted	0.59	1.00			0.67	1.00		0.95	1.00			0.95
Satd. Flow (perm)	1098	1659			1232	1537		1787	5095			1787
Peak-hour factor, PHF	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. Flow (vph)	48	92	110	82	90	257	60	80	1515	71	33	99
RTOR Reduction (vph)	0	55	0	0	0	180	0	0	5	0	0	0
Lane Group Flow (vph)	48	147	0	0	172	77	0	140	1581	0	0	132
Confl. Peds. (#/hr)	13		64	64		13				10		
Confl. Bikes (#/hr)			8			7				2		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	22.8	22.8			22.8	22.8		7.5	41.2			12.5
Effective Green, g (s)	22.8	22.8			22.8	22.8		7.5	41.2			12.5
Actuated g/C Ratio	0.25	0.25			0.25	0.25		0.08	0.46			0.14
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	278	420			312	389		148	2332			248
v/s Ratio Prot		0.09						c0.08	c0.31			0.07
v/s Ratio Perm	0.04				c0.14	0.05						
v/c Ratio	0.17	0.35			0.55	0.20		0.95	0.68			0.53
Uniform Delay, d1	26.2	27.5			29.2	26.4		41.0	19.2			36.0
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.07			0.78
Incremental Delay, d2	0.1	0.2			1.2	0.1		34.6	0.7			1.0
Delay (s)	26.3	27.7			30.4	26.5		75.5	21.3			29.1
Level of Service	C	C			C	C		E	C			C
Approach Delay (s)		27.5			28.0				25.7			
Approach LOS		C			C				C			

Intersection Summary				
HCM 2000 Control Delay		21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio		0.66		
Actuated Cycle Length (s)		90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization		98.3%	ICU Level of Service	F
Analysis Period (min)		15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1571	0
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5136	
Flt Permitted	1.00	
Satd. Flow (perm)	5136	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1571	0
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1571	0
Confl. Peds. (#/hr)		13
Confl. Bikes (#/hr)		13
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	45.7	
Effective Green, g (s)	45.7	
Actuated g/C Ratio	0.51	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2607	
v/s Ratio Prot	c0.31	
v/s Ratio Perm		
v/c Ratio	0.60	
Uniform Delay, d1	15.7	
Progression Factor	0.77	
Incremental Delay, d2	0.9	
Delay (s)	13.0	
Level of Service	B	
Approach Delay (s)	14.3	
Approach LOS	B	

Intersection Summary			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	230	8	6	387	2	15	7	10	0	2	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		0.99			1.00			0.94			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.96			0.88	
Flt Protected		1.00			1.00			0.98			1.00	
Satd. Flow (prot)		3500			3598			1447			1655	
Flt Permitted		0.95			0.95			0.94			1.00	
Satd. Flow (perm)		3341			3425			1386			1655	
Peak-hour factor, PHF	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. Flow (vph)	4	230	8	6	387	2	15	7	10	0	2	15
RTOR Reduction (vph)	0	5	0	0	1	0	0	5	0	0	8	0
Lane Group Flow (vph)	0	237	0	0	394	0	0	27	0	0	9	0
Confl. Peds. (#/hr)	23		72	72		23			263	263		
Confl. Bikes (#/hr)			8			7						2
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Prot	NA		Perm	NA		Perm	NA			NA	
Protected Phases	5	2			6			4			8	
Permitted Phases				6			4			8		
Actuated Green, G (s)		21.0			14.0			23.0			23.0	
Effective Green, g (s)		21.0			14.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.28			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1415			959			637			761	
v/s Ratio Prot		c0.01									0.01	
v/s Ratio Perm		0.06			c0.12			c0.02				
v/c Ratio		0.17			0.41			0.04			0.01	
Uniform Delay, d1		9.0			14.6			7.4			7.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.3			1.3			0.1			0.0	
Delay (s)		9.3			16.0			7.6			7.4	
Level of Service		A			B			A			A	
Approach Delay (s)		9.3			16.0			7.6			7.4	
Approach LOS		A			B			A			A	

Intersection Summary					
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.18				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	9.0		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
12: 52nd Street & Dover Street

Children's Hospital
2020 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	217	1	11	365	40	3	0	7	45	3	32
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	217	1	11	365	40	3	0	7	45	3	32
Pedestrians		26			13			16			30	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			1			1			3	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.87			0.94			0.90	0.90	0.94	0.90	0.90	0.87
vC, conflicting volume	435			234			760	750	246	734	731	441
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	278			147			521	510	160	493	489	285
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	97			99			99	100	99	89	99	95
cM capacity (veh/h)	1087			1330			353	382	789	400	405	631

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	248	416	10	80
Volume Left	30	11	3	45
Volume Right	1	40	7	32
cSH	1087	1330	576	469
Volume to Capacity	0.03	0.01	0.02	0.17
Queue Length 95th (ft)	2	1	1	15
Control Delay (s)	1.3	0.3	11.4	14.3
Lane LOS	A	A	B	B
Approach Delay (s)	1.3	0.3	11.4	14.3
Approach LOS			B	B

Intersection Summary					
Average Delay	2.2				
Intersection Capacity Utilization	44.6%	ICU Level of Service		A	
Analysis Period (min)	15				

HCM Unsignalized Intersection Capacity Analysis
13: SR-24 NB Off-Ramp & 52nd Street

Children's Hospital
2020 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	272	0	0	425	1140	0	970	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	272	0	0	425	1140	0	970	0	0
Pedestrians							32			
Lane Width (ft)							12.0			
Walking Speed (ft/s)							4.0			
Percent Blockage							3			
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.81						0.81		0.81	0.81
vC, conflicting volume	1565			304			1869	168	1531	729
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1221			304			1598	168	1179	185
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	457			1220			83	821	0	556

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	136	136	283	522	760	485	485
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	380	760	485	485
cSH	1700	1700	1700	1700	1700	821	821
Volume to Capacity	0.08	0.08	0.17	0.31	0.45	0.59	0.59
Queue Length 95th (ft)	0	0	0	0	0	99	99
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	15.5	15.5
Lane LOS						C	C
Approach Delay (s)	0.0		0.0			15.5	
Approach LOS						C	

Intersection Summary					
Average Delay	5.4				
Intersection Capacity Utilization	51.9%	ICU Level of Service		A	
Analysis Period (min)	15				

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	50	290	742	160	40	955	110	170	130	40	110	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.99		1.00	1.00		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.97		1.00	0.98		1.00	0.96			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.98
Satd. Flow (prot)		1787	4932		1805	5085		1752	1766			1733
Flt Permitted		0.95	1.00		0.95	1.00		0.39	1.00			0.79
Satd. Flow (perm)		1787	4932		1805	5085		726	1766			1400
Peak-hour factor, PHF	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. Flow (vph)	50	290	742	160	40	955	110	170	130	40	110	160
RTOR Reduction (vph)	0	0	32	0	0	15	0	0	13	0	0	0
Lane Group Flow (vph)	0	340	870	0	40	1050	0	170	157	0	0	270
Confl. Peds. (#/hr)				16			7			13	13	
Confl. Bikes (#/hr)				16			2			13		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		21.5	35.0		5.1	18.6		35.9	35.9			25.4
Effective Green, g (s)		21.5	35.0		5.1	18.6		35.9	35.9			25.4
Actuated g/C Ratio		0.24	0.39		0.06	0.21		0.40	0.40			0.28
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		426	1918		102	1050		363	704			395
v/s Ratio Prot		c0.19	0.18		0.02	c0.21		c0.03	0.09			
v/s Ratio Perm								0.15				c0.19
v/c Ratio		0.80	0.45		0.39	1.00		0.47	0.22			0.68
Uniform Delay, d1		32.2	20.4		41.0	35.7		18.7	17.9			28.7
Progression Factor		1.00	1.00		1.14	0.85		1.00	1.00			1.00
Incremental Delay, d2		14.4	0.8		1.9	24.3		1.0	0.7			9.2
Delay (s)		46.6	21.2		48.6	54.5		19.6	18.6			38.0
Level of Service		D	C		D	D		B	B			D
Approach Delay (s)			28.1			54.3			19.1			31.4
Approach LOS			C			D			B			C

Intersection Summary			
HCM 2000 Control Delay	36.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	104.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	390
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.93
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1398
Flt Permitted	1.00
Satd. Flow (perm)	1398
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	390
RTOR Reduction (vph)	280
Lane Group Flow (vph)	110
Confl. Peds. (#/hr)	21
Confl. Bikes (#/hr)	54
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	25.4
Effective Green, g (s)	25.4
Actuated g/C Ratio	0.28
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	394
v/s Ratio Prot	
v/s Ratio Perm	0.08
v/c Ratio	0.28
Uniform Delay, d1	25.2
Progression Factor	1.00
Incremental Delay, d2	1.8
Delay (s)	26.9
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
15: Telegraph Ave & 52nd Street/Claremont Ave

Children's Hospital
2020 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	10	110	60	180	10	772	130	90	700	344
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.98			0.99		1.00	0.96	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.95		1.00	0.89			0.98		1.00	0.95	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1641		1698	1565			3848		1770	3241	
Flt Permitted		0.98		0.95	1.00			0.94		0.95	1.00	
Satd. Flow (perm)		1641		1698	1565			3625		1770	3241	
Peak-hour factor, PHF	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. Flow (vph)	10	10	10	110	60	180	10	772	130	90	700	344
RTOR Reduction (vph)	0	10	0	0	119	0	0	11	0	0	47	0
Lane Group Flow (vph)	0	21	0	99	132	0	0	901	0	90	997	0
Confl. Peds. (#/hr)	6					6	29		24			29
Confl. Bikes (#/hr)			2			3			43			36
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		4.5		15.7	15.7			43.9		7.9	56.3	
Effective Green, g (s)		4.5		15.7	15.7			43.9		7.9	56.3	
Actuated g/C Ratio		0.05		0.17	0.17			0.49		0.09	0.63	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		82		296	273			1768		155	2027	
v/s Ratio Prot		c0.01		0.06	c0.08					0.05	c0.31	
v/s Ratio Perm								0.25				
v/c Ratio		0.25		0.33	0.48			0.51		0.58	0.49	
Uniform Delay, d1		41.1		32.6	33.5			15.7		39.5	9.1	
Progression Factor		1.57		1.00	1.00			0.95		1.00	1.00	
Incremental Delay, d2		1.0		0.7	1.4			0.9		5.4	0.9	
Delay (s)		65.5		33.2	34.8			15.8		44.9	10.0	
Level of Service		E		C	C			B		D	A	
Approach Delay (s)		65.5			34.4			15.8			12.7	
Approach LOS		E			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	82.7%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
16: Telegraph Ave & 51St Street

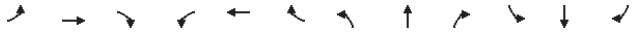
Children's Hospital
2020 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	262	530	80	120	560	270	111	380	70	180	590	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.98		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3404		1787	3322		1719	3313		1752	3433	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3404		1787	3322		1719	3313		1752	3433	
Peak-hour factor, PHF	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. Flow (vph)	262	530	80	120	560	270	111	380	70	180	590	50
RTOR Reduction (vph)	0	13	0	0	64	0	0	16	0	0	6	0
Lane Group Flow (vph)	262	597	0	120	766	0	111	434	0	180	634	0
Confl. Peds. (#/hr)			41			41			39			49
Confl. Bikes (#/hr)			12			10			36			36
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.9	27.0		10.4	26.0		8.9	24.5		11.6	28.2	
Effective Green, g (s)	11.9	27.0		10.4	26.0		8.9	24.5		11.6	28.2	
Actuated g/C Ratio	0.13	0.30		0.12	0.29		0.10	0.27		0.13	0.31	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	449	1021		206	959		169	901		225	1075	
v/s Ratio Prot	c0.08	0.18		0.07	c0.23		0.06	0.13		c0.10	c0.18	
v/s Ratio Perm												
v/c Ratio	0.58	0.58		0.58	0.80		0.66	0.48		0.80	0.59	
Uniform Delay, d1	36.7	26.7		37.7	29.6		39.1	27.4		38.1	26.0	
Progression Factor	1.24	0.93		1.00	1.00		1.00	1.00		1.29	0.74	
Incremental Delay, d2	1.7	2.2		4.2	6.9		8.9	1.8		16.7	2.2	
Delay (s)	47.1	26.9		41.9	36.5		47.9	29.3		65.8	21.3	
Level of Service	D	C		D	D		D	C		E	C	
Approach Delay (s)		33.0			37.2			33.0			31.1	
Approach LOS		C			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	33.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	74.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	191	0	0	0	0	1555	0	0	0	0	1522	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	191	0	0	0	0	1555	0	0	0	0	1522	251
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	191	0	0	0	0	1555	0	0	0	0	1522	251
Confl. Peds. (#/hr)				8								
Confl. Bikes (#/hr)									3			
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	8.0					45.0					29.0	45.0
Effective Green, g (s)	8.0					45.0					29.0	45.0
Actuated g/C Ratio	0.18					1.00					0.64	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	581					1627					2303	2814
v/s Ratio Prot	0.06										0.43	0.09
v/s Ratio Perm						c0.96						
v/c Ratio	0.33					0.96					0.66	0.09
Uniform Delay, d1	16.2					0.0					5.0	0.0
Progression Factor	1.00					1.00					1.76	1.00
Incremental Delay, d2	1.5					14.0					1.2	0.1
Delay (s)	17.7					14.0					10.0	0.1
Level of Service	B					B					A	A
Approach Delay (s)		17.7			14.0			0.0			8.6	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	1.16			
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	54.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	170	20	70	100	0	30	0	80	10	50	10
Peak Hour 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
Hourly flow rate (vph)	0	170	20	70	100	0	30	0	80	10	50	10

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	190	170	30	80	70
Volume Left (vph)	0	70	30	0	10
Volume Right (vph)	20	0	0	80	10
Hadj (s)	-0.05	0.12	0.50	-0.70	-0.02
Departure Headway (s)	4.5	4.7	5.9	4.7	5.0
Degree Utilization, x	0.24	0.22	0.05	0.11	0.10
Capacity (veh/h)	763	727	567	703	661
Control Delay (s)	8.9	9.0	8.1	7.1	8.5
Approach Delay (s)	8.9	9.0	7.4		8.5
Approach LOS	A	A	A		A

Intersection Summary				
Delay	8.6			
Level of Service	A			
Intersection Capacity Utilization	41.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	160	10	10	100	30	10	10	10	20	10	10
Peak Hour 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
Hourly flow rate (vph)	10	160	10	10	100	30	10	10	10	20	10	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	180	140	30	40
Volume Left (vph)	10	10	10	20
Volume Right (vph)	10	30	10	10
Hadj (s)	-0.01	-0.11	-0.13	-0.05
Departure Headway (s)	4.2	4.1	4.5	4.6
Degree Utilization, x	0.21	0.16	0.04	0.05
Capacity (veh/h)	836	848	737	722
Control Delay (s)	8.3	7.9	7.7	7.8
Approach Delay (s)	8.3	7.9	7.7	7.8
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.1	
Level of Service			A	
Intersection Capacity Utilization			24.1%	ICU Level of Service
Analysis Period (min)			15	
				A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (veh/h)	10	370	10	10	360	20	10	20	20	40	20	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	370	10	10	360	20	10	20	20	40	20	10
Pedestrians		11			3			13			15	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	395			393			829	823	391	833	818	396
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	395			393			829	823	391	833	818	396
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			96	93	97	84	93	98
cM capacity (veh/h)	1154			1164			259	298	653	253	298	639

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	390	390	50	70
Volume Left	10	10	10	40
Volume Right	10	20	20	10
cSH	1154	1164	367	291
Volume to Capacity	0.01	0.01	0.14	0.24
Queue Length 95th (ft)	1	1	12	23
Control Delay (s)	0.3	0.3	16.3	21.3
Lane LOS	A	A	C	C
Approach Delay (s)	0.3	0.3	16.3	21.3
Approach LOS			C	C

Intersection Summary				
Average Delay			2.8	
Intersection Capacity Utilization			42.1%	ICU Level of Service
Analysis Period (min)			15	
				A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	34	1642	201	0	1713
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	34	1642	201	0	1713
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			154			137
pX, platoon unblocked	0.85	0.76			0.76	
vC, conflicting volume	2314	648			1843	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	510	0			992	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	417	821			525	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	34	657	657	529	571	571	571
Volume Left	0	0	0	0	0	0	0
Volume Right	34	0	0	201	0	0	0
cSH	821	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.04	0.39	0.39	0.31	0.34	0.34	0.34
Queue Length 95th (ft)	3	0	0	0	0	0	0
Control Delay (s)	9.6	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	9.6	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	46.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	1	1721	25	0	1823
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	1	1721	25	0	1823
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			424			204
pX, platoon unblocked	0.78					
vC, conflicting volume	2341	586			1746	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1741	586			1746	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	61	453			356	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	1	688	688	369	608	608	608
Volume Left	0	0	0	0	0	0	0
Volume Right	1	0	0	25	0	0	0
cSH	453	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.40	0.40	0.22	0.36	0.36	0.36
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	13.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	13.0	0.0			0.0		
Approach LOS	B						

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	43.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	20	260	170	60	170	70	29	211	1652	148	130	1351
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			0.99			1.00	0.99		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.95			0.97			1.00	0.99		1.00	1.00
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1751			1735			1770	4984		1770	5060
Flt Permitted		0.98			0.67			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1718			1181			1770	4984		1770	5060
Peak-hour factor, PHF	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. Flow (vph)	20	260	170	60	170	70	29	211	1652	148	130	1351
RTOR Reduction (vph)	0	24	0	0	12	0	0	0	9	0	0	2
Lane Group Flow (vph)	0	426	0	0	288	0	0	240	1791	0	130	1379
Confl. Peds. (#/hr)	15		20	20		15				26		
Confl. Bikes (#/hr)			21			16				20		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		29.3			29.3			21.5	45.5		10.7	34.7
Effective Green, g (s)		29.3			29.3			21.5	45.5		10.7	34.7
Actuated g/C Ratio		0.29			0.29			0.22	0.46		0.11	0.35
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		503			346			380	2267		189	1755
v/s Ratio Prot								0.14	c0.36		0.07	c0.27
v/s Ratio Perm		c0.25			0.24							
v/c Ratio		0.85			0.83			0.63	0.79		0.69	0.79
Uniform Delay, d1		33.2			33.1			35.7	23.2		43.0	29.3
Progression Factor		1.00			1.00			0.52	0.36		1.00	1.00
Incremental Delay, d2		12.5			15.6			2.9	2.4		10.0	3.6
Delay (s)		45.7			48.6			21.5	10.8		53.0	32.9
Level of Service		D			D			C	B		D	C
Approach Delay (s)		45.7			48.6				12.1			34.7
Approach LOS		D			D				B			C

Intersection Summary			
HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	30
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	30
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	16
Confl. Bikes (#/hr)	20
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	488	20	10	230	20	20	20	30	20	20	40
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	488	20	10	230	20	20	20	30	20	20	40
Pedestrians		6			17			10			23	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked				0.96			0.96	0.96	0.96	0.96	0.96	
vC, conflicting volume	273			518			884	861	525	898	861	269
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	273			473			856	832	481	871	832	269
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			91	93	95	91	93	95
cM capacity (veh/h)	1249			1023			226	276	551	213	273	749

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	538	260	70	80
Volume Left	30	10	20	20
Volume Right	20	20	30	40
cSH	1249	1023	325	363
Volume to Capacity	0.02	0.01	0.22	0.22
Queue Length 95th (ft)	2	1	20	21
Control Delay (s)	0.7	0.4	19.1	17.7
Lane LOS	A	A	C	C
Approach Delay (s)	0.7	0.4	19.1	17.7
Approach LOS			C	C

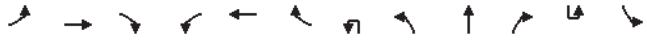
Intersection Summary				
Average Delay	3.4			
Intersection Capacity Utilization	54.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	378	60	30	160	50	50	560	40	30	550	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.99			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.97			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		1751			1760			1833			1853	
Flt Permitted		0.91			0.92			0.92			0.96	
Satd. Flow (perm)		1599			1623			1696			1774	
Peak-hour factor, PHF	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. Flow (vph)	90	378	60	30	160	50	50	560	40	30	550	40
RTOR Reduction (vph)	0	6	0	0	12	0	0	3	0	0	3	0
Lane Group Flow (vph)	0	522	0	0	228	0	0	647	0	0	617	0
Confl. Peds. (#/hr)	15		15	15		15	25		10	10		25
Confl. Bikes (#/hr)			20			13			41			29
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		29.0			29.0			43.0			43.0	
Effective Green, g (s)		29.0			29.0			43.0			43.0	
Actuated g/C Ratio		0.36			0.36			0.54			0.54	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		579			588			911			953	
v/s Ratio Prot												
v/s Ratio Perm		c0.33			0.14			c0.38			0.35	
v/c Ratio		0.90			0.39			0.71			0.65	
Uniform Delay, d1		24.2			18.9			13.8			13.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		19.8			1.9			4.7			3.4	
Delay (s)		43.9			20.8			18.5			16.5	
Level of Service		D			C			B			B	
Approach Delay (s)		43.9			20.8			18.5			16.5	
Approach LOS		D			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	99.7%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	287	30	121	50	20	20	90	987	70	20	991	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.98			0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes		0.99			0.99		0.99	1.00		0.99	1.00	
Frt		0.96			0.97		1.00	0.99		1.00	0.99	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1644			1696		1751	3481		1773	3472	
Flt Permitted		0.77			0.74		0.18	1.00		0.19	1.00	
Satd. Flow (perm)		1302			1286		330	3481		360	3472	
Peak-hour factor, PHF	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. Flow (vph)	287	30	121	50	20	20	90	987	70	20	991	110
RTOR Reduction (vph)	0	16	0	0	12	0	0	6	0	0	9	0
Lane Group Flow (vph)	0	422	0	0	78	0	90	1051	0	20	1092	0
Confl. Peds. (#/hr)	15		34	34		15	33		23	23		33
Confl. Bikes (#/hr)			11			12			38			59
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		32.3			32.3		48.7	48.7		48.7	48.7	
Effective Green, g (s)		32.3			32.3		48.7	48.7		48.7	48.7	
Actuated g/C Ratio		0.36			0.36		0.54	0.54		0.54	0.54	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		467			461		178	1883		194	1878	
v/s Ratio Prot								0.30			c0.31	
v/s Ratio Perm		c0.32			0.06		0.27			0.06		
v/c Ratio		0.90			0.17		0.51	0.56		0.10	0.58	
Uniform Delay, d1		27.4			19.7		13.0	13.6		10.0	13.8	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		20.6			0.2		9.9	1.2		1.1	1.3	
Delay (s)		48.0			19.9		22.9	14.8		11.1	15.2	
Level of Service		D			B		C	B		B	B	
Approach Delay (s)		48.0			19.9			15.4			15.1	
Approach LOS		D			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	79.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (veh/h)	10	10	50	20	10	10	13	40	1989	20	10	20
Sign Control		Stop			Stop				Free			
Grade		0%			0%				0%			
Peak Hour 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
Hourly flow rate (vph)	10	10	50	20	10	10	0	40	1989	20	0	20
Pedestrians		7			25				15			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		1			2				1			
Right turn flare (veh)												
Median type									None			
Median storage veh)												
Upstream signal (ft)									299			
pX, platoon unblocked	0.88	0.88	0.76	0.88	0.88	0.77	0.00	0.76			0.00	0.77
vC, conflicting volume	2365	3721	549	2731	3721	698	0	1577			0	2034
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	263	1812	0	680	1812	0	0	647			0	1284
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			0.0	4.1
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	*4.5	*4.5	*4.5	0.0	2.2			0.0	2.2
p0 queue free %	98	84	94	89	83	98	0	94			0	95
cM capacity (veh/h)	454	61	813	181	59	601	0	705			0	407

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	70	40	537	994	517	408	775	408
Volume Left	10	20	40	0	0	20	0	0
Volume Right	50	10	0	0	20	0	0	20
cSH	282	134	705	1700	1700	407	1700	1700
Volume to Capacity	0.25	0.30	0.06	0.58	0.30	0.05	0.46	0.24
Queue Length 95th (ft)	24	29	5	0	0	4	0	0
Control Delay (s)	21.9	42.8	1.5	0.0	0.0	1.6	0.0	0.0
Lane LOS	C	E	A			A		
Approach Delay (s)	21.9	42.8	0.4			0.4		
Approach LOS	C	E						

Intersection Summary				
Average Delay	1.3			
Intersection Capacity Utilization	89.4%	ICU Level of Service		E
Analysis Period (min)	15			

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
5: MLK Way & 54th Street

Children's Hospital
2020 PM Plus Phase 1

Movement	SBT	SBR
Lane Configurations		
Volume (veh/h)	1550	20
Sign Control	Free	
Grade	0%	
Peak Hour Factor	1.00	1.00
Hourly flow rate (vph)	1550	20
Pedestrians		
Lane Width (ft)		
Walking Speed (ft/s)		
Percent Blockage		
Right turn flare (veh)		
Median type	None	
Median storage veh)		
Upstream signal (ft)	294	
pX, platoon unblocked		
vC, conflicting volume		
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol		
tC, single (s)		
tC, 2 stage (s)		
tF (s)		
p0 queue free %		
cM capacity (veh/h)		

Direction, Lane #

Fehr & Peers

Synchro 8 Report

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	20	10	10	10	20	10	40	10	10	30	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	20	10	10	10	20	10	40	10	10	30	10
Pedestrians		16			11			8			4	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	165	152	59	159	152	60	56			61		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	165	152	59	159	152	60	56			61		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	97	99	99	99	98	99			99		
cM capacity (veh/h)	746	717	992	753	717	999	1541			1541		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	40	40	60	50
Volume Left	10	10	10	10
Volume Right	10	20	10	10
cSH	779	847	1541	1541
Volume to Capacity	0.05	0.05	0.01	0.01
Queue Length 95th (ft)	4	4	0	0
Control Delay (s)	9.9	9.5	1.3	1.5
Lane LOS	A	A	A	A
Approach Delay (s)	9.9	9.5	1.3	1.5
Approach LOS	A	A		

Intersection Summary				
Average Delay		4.9		
Intersection Capacity Utilization	20.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	20	20	660	650	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	20	20	660	650	10
Pedestrians	33				2	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	3				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.82	0.77	0.77			
vC, conflicting volume	1390	688	693			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1087	444	450			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	96	98			
cM capacity (veh/h)	187	462	830			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	30	680	660
Volume Left	10	20	0
Volume Right	20	0	10
cSH	310	830	1700
Volume to Capacity	0.10	0.02	0.39
Queue Length 95th (ft)	8	2	0
Control Delay (s)	17.8	0.6	0.0
Lane LOS	C	A	
Approach Delay (s)	17.8	0.6	0.0
Approach LOS	C		

Intersection Summary				
Average Delay		0.7		
Intersection Capacity Utilization	60.9%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	10	10	60	30	10	10	10	10	2042	59	20	1623
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.90			0.97			1.00	1.00		1.00	1.00
Flt Protected		0.99			0.97			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1631			1782			1770	5043		1787	5128
Flt Permitted		0.97			0.81			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1587			1490			1770	5043		1787	5128
Peak-hour factor, PHF	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. Flow (vph)	10	10	60	30	10	10	10	10	2042	59	20	1623
RTOR Reduction (vph)	0	50	0	0	8	0	0	0	2	0	0	0
Lane Group Flow (vph)	0	30	0	0	42	0	0	20	2099	0	20	1633
Confl. Peds. (#/hr)	11		6	6		11				42		
Confl. Bikes (#/hr)			6			3				17		
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		16.1			16.1			3.1	67.8		3.6	68.3
Effective Green, g (s)		16.1			16.1			3.1	67.8		3.6	68.3
Actuated g/C Ratio		0.16			0.16			0.03	0.68		0.04	0.68
Clearance Time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		255			239			54	3419		64	3502
v/s Ratio Prot								0.01	c0.42		0.01	c0.32
v/s Ratio Perm		0.02			c0.03							
v/c Ratio		0.12			0.17			0.37	0.61		0.31	0.47
Uniform Delay, d1		35.9			36.2			47.5	8.9		47.0	7.4
Progression Factor		1.00			1.06			1.42	0.18		0.78	0.48
Incremental Delay, d2		0.2			0.3			2.9	0.6		1.9	0.3
Delay (s)		36.1			38.9			70.3	2.2		38.5	3.9
Level of Service		D			D			E	A		D	A
Approach Delay (s)		36.1			38.9				2.8			4.3
Approach LOS		D			D				A			A

Intersection Summary			
HCM 2000 Control Delay	4.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: MLK Way & 53rd Street

Children's Hospital
2020 PM Plus Phase 1

Movement	SBR
Lane Configurations	
Volume (vph)	10
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	10
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	19
Confl. Bikes (#/hr)	21
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	10	59	10	10	10	10	40	10	10	30	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	20	10	59	10	10	10	10	40	10	10	30	10
Pedestrians		33			13			6			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	174	171	74	203	171	64	73			63		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	174	171	74	203	171	64	73			63		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	99	94	99	99	99	99			99		
cM capacity (veh/h)	722	689	961	667	689	990	1497			1536		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	89	30	60	50
Volume Left	20	10	10	10
Volume Right	59	10	10	10
cSH	859	757	1497	1536
Volume to Capacity	0.10	0.04	0.01	0.01
Queue Length 95th (ft)	9	3	1	0
Control Delay (s)	9.7	9.9	1.3	1.5
Lane LOS	A	A	A	A
Approach Delay (s)	9.7	9.9	1.3	1.5
Approach LOS	A	A		

Intersection Summary				
Average Delay		5.7		
Intersection Capacity Utilization	24.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	71	129	100	126	99	216	50	90	1743	89	3	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.96			1.00	0.96		1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00			0.97	1.00		1.00	1.00			1.00
Frt	1.00	0.93			1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00			0.97	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1763	1684			1760	1525		1787	5088			1787
Flt Permitted	0.48	1.00			0.55	1.00		0.95	1.00			0.95
Satd. Flow (perm)	899	1684			989	1525		1787	5088			1787
Peak-hour factor, PHF	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. Flow (vph)	71	129	100	126	99	216	50	90	1743	89	3	148
RTOR Reduction (vph)	0	30	0	0	0	160	0	0	5	0	0	0
Lane Group Flow (vph)	71	199	0	0	225	56	0	140	1827	0	0	151
Confl. Peds. (#/hr)	21		80	80		21				13		
Confl. Bikes (#/hr)			12			6				20		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	25.9	25.9			25.9	25.9		12.0	43.1			17.5
Effective Green, g (s)	25.9	25.9			25.9	25.9		12.0	43.1			17.5
Actuated g/C Ratio	0.26	0.26			0.26	0.26		0.12	0.43			0.18
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	232	436			256	394		214	2192			312
v/s Ratio Prot		0.12						0.08	c0.36			0.08
v/s Ratio Perm	0.08				c0.23	0.04						
v/c Ratio	0.31	0.46			0.88	0.14		0.65	0.83			0.48
Uniform Delay, d1	29.8	31.1			35.5	28.5		42.0	25.3			37.2
Progression Factor	1.00	1.00			0.95	2.16		0.97	1.06			0.56
Incremental Delay, d2	0.3	0.3			25.7	0.1		2.1	1.6			0.4
Delay (s)	30.1	31.4			59.5	61.7		42.8	28.3			21.2
Level of Service	C	C			E	E		D	C			C
Approach Delay (s)		31.1			60.6				29.4			
Approach LOS		C			E				C			

Intersection Summary				
HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	105.2%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1562	10
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5128	
Flt Permitted	1.00	
Satd. Flow (perm)	5128	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1562	10
RTOR Reduction (vph)	1	0
Lane Group Flow (vph)	1571	0
Confl. Peds. (#/hr)		17
Confl. Bikes (#/hr)		23
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	48.1	
Effective Green, g (s)	48.1	
Actuated g/C Ratio	0.48	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2466	
v/s Ratio Prot	c0.31	
v/s Ratio Perm		
v/c Ratio	0.64	
Uniform Delay, d1	19.4	
Progression Factor	0.27	
Incremental Delay, d2	1.2	
Delay (s)	6.4	
Level of Service	A	
Approach Delay (s)	7.7	
Approach LOS	A	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	350	5	11	345	2	25	3	13	0	4	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.94			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.96			0.87	
Flt Protected		1.00			1.00			0.97			1.00	
Satd. Flow (prot)		3522			3590			1432			1640	
Flt Permitted		0.95			0.94			0.89			1.00	
Satd. Flow (perm)		3364			3391			1315			1640	
Peak-hour factor, PHF	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. Flow (vph)	3	350	5	11	345	2	25	3	13	0	4	59
RTOR Reduction (vph)	0	2	0	0	1	0	0	7	0	0	32	0
Lane Group Flow (vph)	0	356	0	0	357	0	0	34	0	0	31	0
Confl. Peds. (#/hr)			77	77		33			271	271		
Confl. Bikes (#/hr)			13			8						2
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Prot	NA		Perm	NA		Perm	NA			NA	
Protected Phases	5	2			6			4			8	
Permitted Phases				6			4			8		
Actuated Green, G (s)		21.0			14.0			23.0			23.0	
Effective Green, g (s)		21.0			14.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.28			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1425			949			604			754	
v/s Ratio Prot		c0.02									0.02	
v/s Ratio Perm		0.08			c0.11			c0.03				
v/c Ratio		0.25			0.38			0.06			0.04	
Uniform Delay, d1		9.4			14.5			7.5			7.4	
Progression Factor		1.62			1.00			1.00			1.00	
Incremental Delay, d2		0.4			1.1			0.2			0.1	
Delay (s)		15.6			15.6			7.7			7.5	
Level of Service		B			B			A			A	
Approach Delay (s)		15.6			15.6			7.7			7.5	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	337	7	5	342	40	5	2	8	71	1	28
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	337	7	5	342	40	5	2	8	71	1	28
Pedestrians		49			10			46			20	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		4			1			4			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.89			0.89			0.94	0.94	0.89	0.94	0.94	0.89
vC, conflicting volume	402			390			896	858	396	812	842	431
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	262			254			598	558	262	508	541	294
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	97			100			98	99	99	82	100	96
cM capacity (veh/h)	1131			1128			312	368	644	404	389	627

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	374	387	15	100
Volume Left	30	5	5	71
Volume Right	7	40	8	28
cSH	1131	1128	443	449
Volume to Capacity	0.03	0.00	0.03	0.22
Queue Length 95th (ft)	2	0	3	21
Control Delay (s)	0.9	0.2	13.4	15.3
Lane LOS	A	A	B	C
Approach Delay (s)	0.9	0.2	13.4	15.3
Approach LOS			B	C

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	56.4%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	418	0	0	392	1060	0	1050	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	418	0	0	392	1060	0	1050	0	0
Pedestrians							43			
Lane Width (ft)							12.0			
Walking Speed (ft/s)							4.0			
Percent Blockage							4			
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.82						0.82		0.82	0.82
vC, conflicting volume	1452			461			1913	252	1651	853
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1106			461			1670	252	1349	373
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	513			1057			75	718	0	438

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	209	209	261	484	707	525	525
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	353	707	525	525
cSH	1700	1700	1700	1700	1700	718	718
Volume to Capacity	0.12	0.12	0.15	0.28	0.42	0.73	0.73
Queue Length 95th (ft)	0	0	0	0	0	161	161
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	22.4	22.4
Lane LOS						C	C
Approach Delay (s)	0.0		0.0			22.4	
Approach LOS						C	

Intersection Summary				
Average Delay	8.1			
Intersection Capacity Utilization	56.3%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	50	320	908	190	60	882	150	160	240	60	150	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.98		1.00	0.99		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			0.99
Frt		1.00	0.97		1.00	0.98		1.00	0.97			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.98
Satd. Flow (prot)		1787	4923		1805	5012		1752	1764			1712
Flt Permitted		0.95	1.00		0.95	1.00		0.29	1.00			0.69
Satd. Flow (perm)		1787	4923		1805	5012		527	1764			1218
Peak-hour factor, PHF	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. Flow (vph)	50	320	908	190	60	882	150	160	240	60	150	150
RTOR Reduction (vph)	0	0	28	0	0	21	0	0	8	0	0	0
Lane Group Flow (vph)	0	370	1070	0	60	1011	0	160	292	0	0	300
Confl. Peds. (#/hr)				19	19		15			29	29	
Confl. Bikes (#/hr)				17			11			39		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		33.5	55.1		5.2	26.8		35.7	35.7			26.2
Effective Green, g (s)		33.5	55.1		5.2	26.8		35.7	35.7			26.2
Actuated g/C Ratio		0.30	0.50		0.05	0.24		0.32	0.32			0.24
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		544	2465		85	1221		232	572			290
v/s Ratio Prot		c0.21	0.22		0.03	c0.20		c0.03	0.17			
v/s Ratio Perm								0.19				c0.25
v/c Ratio		0.68	0.43		0.71	0.83		0.69	0.51			1.03
Uniform Delay, d1		33.6	17.5		51.6	39.4		32.2	30.1			41.9
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Incremental Delay, d2		6.7	0.6		23.3	6.5		8.3	3.2			62.1
Delay (s)		40.3	18.1		75.0	46.0		40.5	33.3			104.0
Level of Service		D	B		E	D		D	C			F
Approach Delay (s)			23.7			47.5			35.8			66.8
Approach LOS			C			D			D			E

Intersection Summary			
HCM 2000 Control Delay	40.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	104.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: 52nd Street & Shattuck Ave

Children's Hospital
2020 PM Plus Phase 1

Movement	SBR
Lane Configurations	
Volume (vph)	360
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.93
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1400
Flt Permitted	1.00
Satd. Flow (perm)	1400
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	360
RTOR Reduction (vph)	274
Lane Group Flow (vph)	86
Confl. Peds. (#/hr)	24
Confl. Bikes (#/hr)	36
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	26.2
Effective Green, g (s)	26.2
Actuated g/C Ratio	0.24
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	333
v/s Ratio Prot	
v/s Ratio Perm	0.06
v/c Ratio	0.26
Uniform Delay, d1	34.0
Progression Factor	1.00
Incremental Delay, d2	1.9
Delay (s)	35.9
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

Fehr & Peers

Synchro 8 Report

HCM Signalized Intersection Capacity Analysis
15: Telegraph Ave & 52nd Street/Claremont Ave

Children's Hospital
2020 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	20	20	140	80	180	20	957	270	140	721	301
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.94			0.98		1.00	0.91	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.95		1.00	0.90			0.97		1.00	0.96	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1642		1698	1513			3770		1770	3088	
Flt Permitted		0.98		0.95	1.00			0.93		0.95	1.00	
Satd. Flow (perm)		1642		1698	1513			3496		1770	3088	
Peak-hour factor, PHF	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. Flow (vph)	20	20	20	140	80	180	20	957	270	140	721	301
RTOR Reduction (vph)	0	19	0	0	73	0	0	22	0	0	39	0
Lane Group Flow (vph)	0	41	0	126	201	0	0	1225	0	140	983	0
Confl. Peds. (#/hr)	45					45	91		29			91
Confl. Bikes (#/hr)			2			13			46			63
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		6.2		18.0	18.0			45.9		11.9	62.3	
Effective Green, g (s)		6.2		18.0	18.0			45.9		11.9	62.3	
Actuated g/C Ratio		0.06		0.18	0.18			0.46		0.12	0.62	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		101		305	272			1604		210	1923	
v/s Ratio Prot		c0.03		0.07	c0.13					c0.08	0.32	
v/s Ratio Perm								c0.35				
v/c Ratio		0.41		0.41	0.74			0.76		0.67	0.51	
Uniform Delay, d1		45.1		36.3	38.8			22.5		42.2	10.4	
Progression Factor		1.81		1.00	1.00			0.57		1.00	1.00	
Incremental Delay, d2		1.2		0.9	10.0			2.4		7.8	1.0	
Delay (s)		82.8		37.2	48.8			15.3		49.9	11.4	
Level of Service		F		D	D			B		D	B	
Approach Delay (s)		82.8			45.2			15.3			16.0	
Approach LOS		F			D			B			B	

Intersection Summary				
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	99.6%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
16: Telegraph Ave & 51St Street

Children's Hospital
2020 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	317	660	101	70	520	240	101	690	120	280	541	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.97		1.00	0.98		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3383		1787	3299		1719	3293		1752	3363	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3383		1787	3299		1719	3293		1752	3363	
Peak-hour factor, PHF	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. Flow (vph)	317	660	101	70	520	240	101	690	120	280	541	60
RTOR Reduction (vph)	0	12	0	0	54	0	0	14	0	0	9	0
Lane Group Flow (vph)	317	749	0	70	706	0	101	796	0	280	592	0
Confl. Peds. (#/hr)			68			50			75			120
Confl. Bikes (#/hr)			11			20			45			71
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.2	29.1		8.0	23.4		8.5	33.4		13.0	38.9	
Effective Green, g (s)	14.2	29.1		8.0	23.4		8.5	33.4		13.0	38.9	
Actuated g/C Ratio	0.14	0.29		0.08	0.23		0.08	0.33		0.13	0.39	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	482	984		142	771		146	1099		227	1308	
v/s Ratio Prot	c0.09	0.22		0.04	c0.21		0.06	c0.24		c0.16	0.18	
v/s Ratio Perm												
v/c Ratio	0.66	0.76		0.49	0.92		0.69	0.72		1.23	0.45	
Uniform Delay, d1	40.6	32.3		44.1	37.3		44.5	29.3		43.5	22.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.21	0.70	
Incremental Delay, d2	3.2	5.5		2.7	17.4		13.2	4.2		134.2	1.0	
Delay (s)	43.8	37.8		46.7	54.8		57.7	33.4		186.8	16.8	
Level of Service	D	D		D	D		E	C		F	B	
Approach Delay (s)		39.6			54.1			36.1			70.8	
Approach LOS		D			D			D			E	

Intersection Summary				
HCM 2000 Control Delay	49.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	85.3%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
17: SB SR-24 On-Ramp & MLK Way & NB SR-24 Off-Ramp

Children's Hospital
2020 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	300	0	0	0	0	1672	0	0	0	0	1628	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	300	0	0	0	0	1672	0	0	0	0	1628	240
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	300	0	0	0	0	1672	0	0	0	0	1628	240
Confl. Peds. (#/hr)				3								
Confl. Bikes (#/hr)									12			
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	13.0					50.0					29.0	50.0
Effective Green, g (s)	13.0					50.0					29.0	50.0
Actuated g/C Ratio	0.26					1.00					0.58	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	850					1627					2072	2814
v/s Ratio Prot	0.09										0.46	0.09
v/s Ratio Perm						c1.03						
v/c Ratio	0.35					1.03					0.79	0.09
Uniform Delay, d1	15.1					25.0					8.1	0.0
Progression Factor	1.00					1.00					2.66	1.00
Incremental Delay, d2	1.2					29.7					2.4	0.0
Delay (s)	16.2					54.7					24.0	0.0
Level of Service	B					D					C	A
Approach Delay (s)		16.2			54.7			0.0			20.9	
Approach LOS		B			D			A			C	

Intersection Summary				
HCM 2000 Control Delay	35.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.22			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	60.2%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
18: West Street & 52nd Street

Children's Hospital
2020 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	140	10	90	109	0	50	0	140	10	60	10
Peak Hour 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
Hourly flow rate (vph)	0	140	10	90	109	0	50	0	140	10	60	10

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	150	199	50	140	80
Volume Left (vph)	0	90	50	0	10
Volume Right (vph)	10	0	0	140	10
Hadj (s)	-0.02	0.12	0.50	-0.70	-0.02
Departure Headway (s)	4.8	4.9	6.0	4.8	5.1
Degree Utilization, x	0.20	0.27	0.08	0.19	0.11
Capacity (veh/h)	696	693	568	704	641
Control Delay (s)	9.0	9.7	8.3	7.6	8.8
Approach Delay (s)	9.0	9.7	7.8		8.8
Approach LOS	A	A	A		A

Intersection Summary				
Delay	8.8			
Level of Service	A			
Intersection Capacity Utilization	42.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	130	10	10	109	50	10	10	10	20	10	10
Peak Hour 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
Hourly flow rate (vph)	10	130	10	10	109	50	10	10	10	20	10	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	150	169	30	40
Volume Left (vph)	10	10	10	20
Volume Right (vph)	10	50	10	10
Hadj (s)	-0.01	-0.17	-0.13	-0.05
Departure Headway (s)	4.2	4.1	4.5	4.6
Degree Utilization, x	0.18	0.19	0.04	0.05
Capacity (veh/h)	830	867	738	724
Control Delay (s)	8.1	8.0	7.7	7.8
Approach Delay (s)	8.1	8.0	7.7	7.8
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.0	
Level of Service			A	
Intersection Capacity Utilization			23.7%	ICU Level of Service
Analysis Period (min)			15	
				A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (veh/h)	20	380	10	20	381	40	10	20	40	40	10	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	20	380	10	20	381	40	10	20	40	40	10	20
Pedestrians		7						10			4	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		1						1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	425			400			908	900	395	920	885	412
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	425			400			908	900	395	920	885	412
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			96	93	94	81	96	97
cM capacity (veh/h)	1136			1160			231	268	653	214	271	634

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	410	441	70	70
Volume Left	20	20	10	40
Volume Right	10	40	40	20
cSH	1136	1160	391	274
Volume to Capacity	0.02	0.02	0.18	0.26
Queue Length 95th (ft)	1	1	16	25
Control Delay (s)	0.6	0.5	16.2	22.6
Lane LOS	A	A	C	C
Approach Delay (s)	0.6	0.5	16.2	22.6
Approach LOS			C	C

Intersection Summary				
Average Delay			3.2	
Intersection Capacity Utilization			47.4%	ICU Level of Service
Analysis Period (min)			15	
				A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	123	1999	34	0	1723
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	123	1999	34	0	1723
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			154			137
pX, platoon unblocked	0.76	0.68			0.68	
vC, conflicting volume	2590	683			2033	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	643	0			876	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	83			100	
cM capacity (veh/h)	307	738			522	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	123	800	800	434	574	574	574
Volume Left	0	0	0	0	0	0	0
Volume Right	123	0	0	34	0	0	0
cSH	738	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.17	0.47	0.47	0.26	0.34	0.34	0.34
Queue Length 95th (ft)	15	0	0	0	0	0	0
Control Delay (s)	10.8	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	10.8	0.0			0.0		
Approach LOS	B						

Intersection Summary				
Average Delay		0.3		
Intersection Capacity Utilization		53.7%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	1952	20	0	1838
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	1952	20	0	1838
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			424			204
pX, platoon unblocked	0.77					
vC, conflicting volume	2575	661			1972	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2001	661			1972	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	40	405			290	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	0	781	781	410	613	613	613
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	20	0	0	0
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.46	0.46	0.24	0.36	0.36	0.36
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	0.0	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		41.5%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection Sign configuration not allowed in HCM analysis.

Appendix I

LOS Calculation Worksheets – 2020 Plus Phase 2 Conditions

FEHR PEERS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	20	180	230	60	240	80	21	150	1386	70	90	1341
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			0.99			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.93			0.97			1.00	0.99		1.00	0.99
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1703			1747			1770	5029		1770	5047
Flt Permitted		0.98			0.77			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1664			1360			1770	5029		1770	5047
Peak-hour factor, PHF	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. Flow (vph)	20	180	230	60	240	80	21	150	1386	70	90	1341
RTOR Reduction (vph)	0	52	0	0	12	0	0	0	5	0	0	4
Lane Group Flow (vph)	0	378	0	0	368	0	0	171	1451	0	90	1387
Confl. Peds. (#/hr)	10		19	19		10				28		
Confl. Bikes (#/hr)			21			20				8		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		27.7			27.7			14.4	41.8		6.0	33.4
Effective Green, g (s)		27.7			27.7			14.4	41.8		6.0	33.4
Actuated g/C Ratio		0.31			0.31			0.16	0.46		0.07	0.37
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		512			418			283	2335		118	1872
v/s Ratio Prot								0.10	c0.29		0.05	c0.27
v/s Ratio Perm		0.23			c0.27							
v/c Ratio		0.74			0.88			0.60	0.62		0.76	0.74
Uniform Delay, d1		27.9			29.6			35.2	18.1		41.3	24.5
Progression Factor		1.00			1.00			0.53	0.20		1.00	1.00
Incremental Delay, d2		5.5			19.0			3.3	1.1		24.8	2.7
Delay (s)		33.4			48.6			21.9	4.8		66.1	27.2
Level of Service		C			D			C	A		E	C
Approach Delay (s)		33.4			48.6				6.6			29.6
Approach LOS		C			D				A			C

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	90.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: MLK Way & 55th Street

Children's Hospital
2020 AM Plus Phase 2

Movement	SBR
Lane Configurations	
Volume (vph)	50
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	50
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	16
Confl. Bikes (#/hr)	10
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis
2: Dover Street & 55th Street

Children's Hospital
2020 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	300	10	33	320	10	10	10	22	10	10	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	300	10	33	320	10	10	10	22	10	10	30
Pedestrians		12			26			20			8	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			2			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked	0.89						0.89	0.89		0.89	0.89	0.89
vC, conflicting volume	338			330			823	789	351	817	789	345
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	192			330			738	700	351	731	700	200
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			97			96	97	97	96	97	96
cM capacity (veh/h)	1203			1198			257	301	671	258	298	733

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	340	363	42	50
Volume Left	30	33	10	10
Volume Right	10	10	22	30
cSH	1203	1198	400	442
Volume to Capacity	0.02	0.03	0.10	0.11
Queue Length 95th (ft)	2	2	9	10
Control Delay (s)	0.9	1.0	15.1	14.2
Lane LOS	A	A	C	B
Approach Delay (s)	0.9	1.0	15.1	14.2
Approach LOS			C	B

Intersection Summary				
Average Delay			2.5	
Intersection Capacity Utilization			41.9%	ICU Level of Service
Analysis Period (min)			15	

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
2020 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	232	60	32	273	50	40	460	31	30	570	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.99			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.99			0.99	
Flt Protected		0.99			1.00			1.00			1.00	
Satd. Flow (prot)		1727			1787			1835			1855	
Flt Permitted		0.85			0.95			0.93			0.96	
Satd. Flow (perm)		1488			1712			1709			1792	
Peak-hour factor, PHF	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. Flow (vph)	60	232	60	32	273	50	40	460	31	30	570	40
RTOR Reduction (vph)	0	9	0	0	8	0	0	3	0	0	3	0
Lane Group Flow (vph)	0	343	0	0	347	0	0	528	0	0	637	0
Confl. Peds. (#/hr)	8		17	17		8	10		23	23		10
Confl. Bikes (#/hr)			29			13			17			32
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		25.0			25.0			47.0			47.0	
Effective Green, g (s)		25.0			25.0			47.0			47.0	
Actuated g/C Ratio		0.31			0.31			0.59			0.59	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		465			535			1004			1052	
v/s Ratio Prot												
v/s Ratio Perm		c0.23			0.20			0.31			c0.36	
v/c Ratio		0.74			0.65			0.53			0.61	
Uniform Delay, d1		24.6			23.7			9.9			10.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		10.0			6.0			2.0			2.6	
Delay (s)		34.6			29.7			11.8			13.2	
Level of Service		C			C			B			B	
Approach Delay (s)		34.6			29.7			11.8			13.2	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM 2000 Control Delay		19.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio		0.65		
Actuated Cycle Length (s)		80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization		80.3%	ICU Level of Service	D
Analysis Period (min)		15		
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
2020 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	163	20	90	40	10	10	70	850	50	40	1000	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	0.99		1.00	0.98	
Flpb, ped/bikes		1.00			0.99		1.00	1.00		0.99	1.00	
Frt		0.96			0.98		1.00	0.99		1.00	0.97	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1649			1709		1763	3491		1768	3409	
Flt Permitted		0.78			0.76		0.16	1.00		0.28	1.00	
Satd. Flow (perm)		1328			1339		299	3491		517	3409	
Peak-hour factor, PHF	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. Flow (vph)	163	20	90	40	10	10	70	850	50	40	1000	265
RTOR Reduction (vph)	0	30	0	0	7	0	0	5	0	0	27	0
Lane Group Flow (vph)	0	243	0	0	53	0	70	895	0	40	1238	0
Confl. Peds. (#/hr)	8		15	15		8	17		23	23		17
Confl. Bikes (#/hr)			20			20			56			36
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		18.2			18.2		42.8	42.8		42.8	42.8	
Effective Green, g (s)		18.2			18.2		42.8	42.8		42.8	42.8	
Actuated g/C Ratio		0.26			0.26		0.61	0.61		0.61	0.61	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		345			348		182	2134		316	2084	
v/s Ratio Prot								0.26			c0.36	
v/s Ratio Perm		c0.18			0.04		0.23			0.08		
v/c Ratio		0.71			0.15		0.38	0.42		0.13	0.59	
Uniform Delay, d1		23.5			20.0		6.9	7.1		5.7	8.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		6.4			0.2		6.0	0.6		0.8	1.3	
Delay (s)		29.9			20.2		13.0	7.7		6.6	9.6	
Level of Service		C			C		B	A		A	A	
Approach Delay (s)		29.9			20.2			8.1			9.5	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	11.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	70.1%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
5: MLK Way & 54th Street

Children's Hospital
2020 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	10	10	50	10	10	10	10	20	1577	20	20	1602
Sign Control		Stop			Stop				Free			Free
Grade		0%			0%				0%			0%
Peak Hour 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
Hourly flow rate (vph)	10	10	50	10	10	10	0	20	1577	20	20	1602
Pedestrians		10			8				11			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		1			1				1			
Right turn flare (veh)												
Median type									None			None
Median storage veh)												
Upstream signal (ft)									299			294
pX, platoon unblocked	0.85	0.85	0.77	0.85	0.85	0.83	0.00	0.77			0.83	
vC, conflicting volume	2238	3302	560	2275	3297	544	0	1622			1605	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	506	1756	0	549	1750	0	0	747			1018	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	*5.0	*5.0	*5.0	0.0	2.2			2.2	
p0 queue free %	97	85	94	95	84	98	0	97			96	
cM capacity (veh/h)	312	67	822	215	64	595	0	652			564	

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	70	30	414	788	414	420	801	410
Volume Left	10	10	20	0	0	20	0	0
Volume Right	50	10	0	0	20	0	0	10
cSH	290	136	652	1700	1700	564	1700	1700
Volume to Capacity	0.24	0.22	0.03	0.46	0.24	0.04	0.47	0.24
Queue Length 95th (ft)	23	20	2	0	0	3	0	0
Control Delay (s)	21.3	38.7	0.9	0.0	0.0	1.1	0.0	0.0
Lane LOS	C	E	A			A		
Approach Delay (s)	21.3	38.7	0.2			0.3		
Approach LOS	C	E						

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	66.7%	ICU Level of Service	C	
Analysis Period (min)	15			

* User Entered Value

Movement	SBR
Lane Configurations	
Volume (veh/h)	10
Sign Control	
Grade	
Peak Hour Factor	1.00
Hourly flow rate (vph)	10
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	
tC, single (s)	
tC, 2 stage (s)	
tF (s)	
p0 queue free %	
cM capacity (veh/h)	

Direction, Lane #

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	10	10	10	10	10	10	22	20	10	43	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	10	10	10	10	10	10	22	20	10	43	10
Pedestrians		13			19			3			8	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	156	162	64	157	157	59	66			61		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	156	162	64	157	157	59	66			61		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	99	99	99	99	99			99		
cM capacity (veh/h)	761	705	993	759	710	990	1532			1531		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	30	30	52	63
Volume Left	10	10	10	10
Volume Right	10	10	20	10
cSH	802	803	1532	1531
Volume to Capacity	0.04	0.04	0.01	0.01
Queue Length 95th (ft)	3	3	0	0
Control Delay (s)	9.7	9.7	1.5	1.2
Lane LOS	A	A	A	A
Approach Delay (s)	9.7	9.7	1.5	1.2
Approach LOS	A	A		

Intersection Summary				
Average Delay	4.2			
Intersection Capacity Utilization	21.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	20	20	521	632	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	20	20	521	632	10
Pedestrians	12			3	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.79	0.79	0.79			
vC, conflicting volume	1212	652	654			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1122	422	424			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	96	98			
cM capacity (veh/h)	175	494	884			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	30	541	642
Volume Left	10	20	0
Volume Right	20	0	10
cSH	308	884	1700
Volume to Capacity	0.10	0.02	0.38
Queue Length 95th (ft)	8	2	0
Control Delay (s)	18.0	0.6	0.0
Lane LOS	C	A	
Approach Delay (s)	18.0	0.6	0.0
Approach LOS	C		

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		54.6%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	40	20	10	20	30	1607	37	20	1662	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.98			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.91			0.95		1.00	1.00		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1653			1742		1770	5060		1787	5128	
Flt Permitted		0.96			0.88		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1595			1569		1770	5060		1787	5128	
Peak-hour factor, PHF	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. Flow (vph)	10	10	40	20	10	20	30	1607	37	20	1662	10
RTOR Reduction (vph)	0	33	0	0	16	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	27	0	0	34	0	30	1643	0	20	1672	0
Confl. Peds. (#/hr)	10		17	17		10			17			26
Confl. Bikes (#/hr)									7			17
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		15.8			15.8		4.5	58.1		3.6	57.2	
Effective Green, g (s)		15.8			15.8		4.5	58.1		3.6	57.2	
Actuated g/C Ratio		0.18			0.18		0.05	0.65		0.04	0.64	
Clearance Time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		280			275		88	3266		71	3259	
v/s Ratio Prot							0.02	c0.32		0.01	c0.33	
v/s Ratio Perm		0.02			c0.02							
v/c Ratio		0.10			0.12		0.34	0.50		0.28	0.51	
Uniform Delay, d1		31.1			31.3		41.3	8.4		41.9	8.9	
Progression Factor		1.00			1.02		1.18	0.47		0.53	0.26	
Incremental Delay, d2		0.2			0.2		1.8	0.4		1.6	0.4	
Delay (s)		31.3			32.0		50.5	4.3		23.9	2.7	
Level of Service		C			C		D	A		C	A	
Approach Delay (s)		31.3			32.0			5.2			2.9	
Approach LOS		C			C			A			A	

Intersection Summary					
HCM 2000 Control Delay		4.9	HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio		0.45			
Actuated Cycle Length (s)		90.0	Sum of lost time (s)		12.5
Intersection Capacity Utilization		57.1%	ICU Level of Service		B
Analysis Period (min)		15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
9: Dover Street & 53rd Street

Children's Hospital
2020 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	10	37	10	10	10	20	32	20	10	33	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	20	10	37	10	10	10	20	32	20	10	33	20
Pedestrians		29			28			3			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			2			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	192	212	75	218	212	73	82			80		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	192	212	75	218	212	73	82			80		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	98	96	98	98	99	99			99		
cM capacity (veh/h)	698	643	966	653	643	969	1491			1495		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	67	30	72	63
Volume Left	20	10	20	10
Volume Right	37	10	20	20
cSH	812	729	1491	1495
Volume to Capacity	0.08	0.04	0.01	0.01
Queue Length 95th (ft)	7	3	1	1
Control Delay (s)	9.8	10.2	2.1	1.2
Lane LOS	A	B	A	A
Approach Delay (s)	9.8	10.2	2.1	1.2
Approach LOS	A	B		

Intersection Summary				
Average Delay			5.1	
Intersection Capacity Utilization			23.6%	ICU Level of Service
Analysis Period (min)			15	

HCM Signalized Intersection Capacity Analysis
10: MLK Way & 52nd Street

Children's Hospital
2020 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	48	95	110	99	92	263	60	80	1514	127	33	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.96			1.00	0.97		1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00			0.98	1.00		1.00	1.00			1.00
Frt	1.00	0.92			1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00			0.97	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1772	1662			1778	1537		1787	5058			1787
Flt Permitted	0.56	1.00			0.63	1.00		0.95	1.00			0.95
Satd. Flow (perm)	1041	1662			1141	1537		1787	5058			1787
Peak-hour factor, PHF	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. Flow (vph)	48	95	110	99	92	263	60	80	1514	127	33	108
RTOR Reduction (vph)	0	53	0	0	0	178	0	0	9	0	0	0
Lane Group Flow (vph)	48	152	0	0	191	85	0	140	1632	0	0	141
Confl. Peds. (#/hr)	13		64	64		13				10		
Confl. Bikes (#/hr)			8			7				2		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	23.4	23.4			23.4	23.4		7.5	40.6			12.5
Effective Green, g (s)	23.4	23.4			23.4	23.4		7.5	40.6			12.5
Actuated g/C Ratio	0.26	0.26			0.26	0.26		0.08	0.45			0.14
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	270	432			296	399		148	2281			248
v/s Ratio Prot		0.09						c0.08	c0.32			0.08
v/s Ratio Perm	0.05				c0.17	0.06						
v/c Ratio	0.18	0.35			0.65	0.21		0.95	0.72			0.57
Uniform Delay, d1	25.8	27.1			29.6	26.1		41.0	20.0			36.2
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.07			0.78
Incremental Delay, d2	0.1	0.2			3.6	0.1		33.1	0.8			1.6
Delay (s)	26.0	27.3			33.2	26.2		74.0	22.2			29.9
Level of Service	C	C			C	C		E	C			C
Approach Delay (s)		27.1			29.1				26.3			
Approach LOS		C			C				C			

Intersection Summary				
HCM 2000 Control Delay		21.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio		0.70		
Actuated Cycle Length (s)		90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization		100.3%	ICU Level of Service	G
Analysis Period (min)		15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1571	0
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5136	
Flt Permitted	1.00	
Satd. Flow (perm)	5136	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1571	0
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1571	0
Confl. Peds. (#/hr)		13
Confl. Bikes (#/hr)		13
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	45.1	
Effective Green, g (s)	45.1	
Actuated g/C Ratio	0.50	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2573	
v/s Ratio Prot	c0.31	
v/s Ratio Perm		
v/c Ratio	0.61	
Uniform Delay, d1	16.1	
Progression Factor	0.77	
Incremental Delay, d2	1.0	
Delay (s)	13.4	
Level of Service	B	
Approach Delay (s)	14.7	
Approach LOS	B	

Intersection Summary			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	302	4	3	420	2	7	3	5	0	2	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.94			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.95			0.88	
Flt Protected		1.00			1.00			0.98			1.00	
Satd. Flow (prot)		1854			1897			1437			1655	
Flt Permitted		1.00			1.00			0.95			1.00	
Satd. Flow (perm)		1848			1894			1398			1655	
Peak-hour factor, PHF	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. Flow (vph)	4	302	4	3	420	2	7	3	5	0	2	15
RTOR Reduction (vph)	0	1	0	0	1	0	0	3	0	0	8	0
Lane Group Flow (vph)	0	309	0	0	424	0	0	12	0	0	9	0
Confl. Peds. (#/hr)	23		72	72		23			263	263		
Confl. Bikes (#/hr)			8			7						2
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		21.0			21.0			23.0			23.0	
Effective Green, g (s)		21.0			21.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.42			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		776			795			643			761	
v/s Ratio Prot											0.01	
v/s Ratio Perm		0.17			c0.22			c0.01				
v/c Ratio		0.40			0.53			0.02			0.01	
Uniform Delay, d1		10.1			10.8			7.4			7.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.5			2.6			0.1			0.0	
Delay (s)		11.6			13.4			7.4			7.4	
Level of Service		B			B			A			A	
Approach Delay (s)		11.6			13.4			7.4			7.4	
Approach LOS		B			B			A			A	

Intersection Summary					
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.26				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	6.0		
Intersection Capacity Utilization	49.8%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
12: 52nd Street & Dover Street

Children's Hospital
2020 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	212	73	42	362	40	36	2	26	45	6	32
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	212	73	42	362	40	36	2	26	45	6	32
Pedestrians		26			13			16			30	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			1			1			3	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.85			0.89			0.91	0.91	0.89	0.91	0.91	0.85
vC, conflicting volume	432			301			852	840	278	844	857	438
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	249			156			518	505	129	510	524	256
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	97			97			90	99	97	88	98	95
cM capacity (veh/h)	1091			1259			348	376	783	373	379	641

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	315	444	64	83
Volume Left	30	42	36	45
Volume Right	73	40	26	32
cSH	1091	1259	450	445
Volume to Capacity	0.03	0.03	0.14	0.19
Queue Length 95th (ft)	2	3	12	17
Control Delay (s)	1.1	1.1	14.3	14.9
Lane LOS	A	A	B	B
Approach Delay (s)	1.1	1.1	14.3	14.9
Approach LOS			B	B

Intersection Summary					
Average Delay	3.3				
Intersection Capacity Utilization	48.8%	ICU Level of Service		A	
Analysis Period (min)	15				

HCM Unsignalized Intersection Capacity Analysis
13: SR-24 NB Off-Ramp & 52nd Street

Children's Hospital
2020 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	286	0	0	453	1140	0	970	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	286	0	0	453	1140	0	970	0	0
Pedestrians							32			
Lane Width (ft)							12.0			
Walking Speed (ft/s)							4.0			
Percent Blockage							3			
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.80						0.80		0.80	0.80
vC, conflicting volume	1593			318			1911	175	1566	771
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1252			318			1647	175	1218	230
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	444			1206			77	813	0	524

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	143	143	302	531	760	485	485
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	380	760	485	485
cSH	1700	1700	1700	1700	1700	813	813
Volume to Capacity	0.08	0.08	0.18	0.31	0.45	0.60	0.60
Queue Length 95th (ft)	0	0	0	0	0	101	101
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	15.8	15.8
Lane LOS						C	C
Approach Delay (s)	0.0		0.0			15.8	
Approach LOS						C	

Intersection Summary					
Average Delay	5.4				
Intersection Capacity Utilization	52.1%	ICU Level of Service		A	
Analysis Period (min)	15				

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	50	291	755	160	40	981	110	170	130	40	110	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.99		1.00	1.00		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.97		1.00	0.98		1.00	0.96			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.98
Satd. Flow (prot)		1787	4934		1805	5087		1752	1766			1733
Flt Permitted		0.95	1.00		0.95	1.00		0.39	1.00			0.79
Satd. Flow (perm)		1787	4934		1805	5087		726	1766			1400
Peak-hour factor, PHF	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. Flow (vph)	50	291	755	160	40	981	110	170	130	40	110	160
RTOR Reduction (vph)	0	0	31	0	0	15	0	0	13	0	0	0
Lane Group Flow (vph)	0	341	884	0	40	1076	0	170	157	0	0	270
Confl. Peds. (#/hr)				16			7			13	13	
Confl. Bikes (#/hr)				16			2			13		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		21.5	35.0		5.1	18.6		35.9	35.9			25.4
Effective Green, g (s)		21.5	35.0		5.1	18.6		35.9	35.9			25.4
Actuated g/C Ratio		0.24	0.39		0.06	0.21		0.40	0.40			0.28
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		426	1918		102	1051		363	704			395
v/s Ratio Prot		c0.19	0.18		0.02	c0.21		c0.03	0.09			
v/s Ratio Perm								0.15				c0.19
v/c Ratio		0.80	0.46		0.39	1.02		0.47	0.22			0.68
Uniform Delay, d1		32.2	20.5		41.0	35.7		18.7	17.9			28.7
Progression Factor		1.00	1.00		1.14	0.86		1.00	1.00			1.00
Incremental Delay, d2		14.6	0.8		1.9	30.6		1.0	0.7			9.2
Delay (s)		46.8	21.3		48.5	61.1		19.6	18.6			38.0
Level of Service		D	C		D	E		B	B			D
Approach Delay (s)			28.2			60.7			19.1			31.4
Approach LOS			C			E			B			C

Intersection Summary			
HCM 2000 Control Delay	38.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	105.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: 52nd Street & Shattuck Ave

Children's Hospital
2020 AM Plus Phase 2

Movement	SBR
Lane Configurations	
Volume (vph)	392
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.93
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1398
Flt Permitted	1.00
Satd. Flow (perm)	1398
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	392
RTOR Reduction (vph)	281
Lane Group Flow (vph)	111
Confl. Peds. (#/hr)	21
Confl. Bikes (#/hr)	54
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	25.4
Effective Green, g (s)	25.4
Actuated g/C Ratio	0.28
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	394
v/s Ratio Prot	
v/s Ratio Perm	0.08
v/c Ratio	0.28
Uniform Delay, d1	25.2
Progression Factor	1.00
Incremental Delay, d2	1.8
Delay (s)	27.0
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Fehr & Peers

Synchro 8 Report

HCM Signalized Intersection Capacity Analysis
15: Telegraph Ave & 52nd Street/Claremont Ave

Children's Hospital
2020 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	10	110	60	180	10	780	130	90	700	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.98			0.99		1.00	0.96	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.95		1.00	0.89			0.98		1.00	0.95	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1641		1698	1565			3849		1770	3232	
Flt Permitted		0.98		0.95	1.00			0.94		0.95	1.00	
Satd. Flow (perm)		1641		1698	1565			3625		1770	3232	
Peak-hour factor, PHF	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. Flow (vph)	10	10	10	110	60	180	10	780	130	90	700	360
RTOR Reduction (vph)	0	10	0	0	119	0	0	11	0	0	51	0
Lane Group Flow (vph)	0	21	0	99	132	0	0	909	0	90	1009	0
Confl. Peds. (#/hr)	6					6	29		24			29
Confl. Bikes (#/hr)			2			3			43			36
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		4.5		15.7	15.7			43.9		7.9	56.3	
Effective Green, g (s)		4.5		15.7	15.7			43.9		7.9	56.3	
Actuated g/C Ratio		0.05		0.17	0.17			0.49		0.09	0.63	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		82		296	273			1768		155	2021	
v/s Ratio Prot		c0.01		0.06	c0.08					0.05	c0.31	
v/s Ratio Perm								0.25				
v/c Ratio		0.25		0.33	0.48			0.51		0.58	0.50	
Uniform Delay, d1		41.1		32.6	33.5			15.8		39.5	9.2	
Progression Factor		1.56		1.00	1.00			0.97		1.00	1.00	
Incremental Delay, d2		1.0		0.7	1.4			0.9		5.4	0.9	
Delay (s)		65.3		33.2	34.8			16.1		44.9	10.1	
Level of Service		E		C	C			B		D	B	
Approach Delay (s)		65.3			34.4			16.1			12.8	
Approach LOS		E			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	83.5%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
16: Telegraph Ave & 51St Street

Children's Hospital
2020 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	270	532	83	120	564	270	117	380	70	180	590	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.98		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3401		1787	3323		1719	3313		1752	3433	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3401		1787	3323		1719	3313		1752	3433	
Peak-hour factor, PHF	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. Flow (vph)	270	532	83	120	564	270	117	380	70	180	590	50
RTOR Reduction (vph)	0	14	0	0	63	0	0	16	0	0	6	0
Lane Group Flow (vph)	270	601	0	120	771	0	117	434	0	180	634	0
Confl. Peds. (#/hr)			41			41			39			49
Confl. Bikes (#/hr)			12			10			36			36
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	12.0	27.0		10.4	25.9		9.0	24.5		11.6	28.1	
Effective Green, g (s)	12.0	27.0		10.4	25.9		9.0	24.5		11.6	28.1	
Actuated g/C Ratio	0.13	0.30		0.12	0.29		0.10	0.27		0.13	0.31	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	453	1020		206	956		171	901		225	1071	
v/s Ratio Prot	c0.08	0.18		0.07	c0.23		0.07	0.13		c0.10	c0.18	
v/s Ratio Perm												
v/c Ratio	0.60	0.59		0.58	0.81		0.68	0.48		0.80	0.59	
Uniform Delay, d1	36.7	26.8		37.7	29.7		39.1	27.4		38.1	26.1	
Progression Factor	1.24	0.93		1.00	1.00		1.00	1.00		1.29	0.74	
Incremental Delay, d2	1.9	2.2		4.2	7.2		10.8	1.8		16.6	2.2	
Delay (s)	47.5	27.2		41.9	36.9		49.9	29.3		65.5	21.4	
Level of Service	D	C		D	D		D	C		E	C	
Approach Delay (s)		33.4			37.6			33.5			31.1	
Approach LOS		C			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	75.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	193	0	0	0	0	1584	0	0	0	0	1538	252
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	193	0	0	0	0	1584	0	0	0	0	1538	252
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	193	0	0	0	0	1584	0	0	0	0	1538	252
Confl. Peds. (#/hr)				8								
Confl. Bikes (#/hr)									3			
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	8.0					45.0					29.0	45.0
Effective Green, g (s)	8.0					45.0					29.0	45.0
Actuated g/C Ratio	0.18					1.00					0.64	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	581					1627					2303	2814
v/s Ratio Prot	0.06										0.43	0.09
v/s Ratio Perm						c0.97						
v/c Ratio	0.33					0.97					0.67	0.09
Uniform Delay, d1	16.2					0.0					5.0	0.0
Progression Factor	1.00					1.00					1.75	1.00
Incremental Delay, d2	1.5					16.9					1.3	0.1
Delay (s)	17.7					16.9					10.0	0.1
Level of Service	B					B					A	A
Approach Delay (s)		17.7			16.9			0.0			8.6	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	1.18			
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	54.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	173	20	70	102	0	30	0	80	10	50	10
Peak Hour 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
Hourly flow rate (vph)	0	173	20	70	102	0	30	0	80	10	50	10

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	193	172	30	80	70
Volume Left (vph)	0	70	30	0	10
Volume Right (vph)	20	0	0	80	10
Hadj (s)	-0.05	0.12	0.50	-0.70	-0.02
Departure Headway (s)	4.5	4.7	6.0	4.7	5.0
Degree Utilization, x	0.24	0.22	0.05	0.11	0.10
Capacity (veh/h)	763	727	565	700	658
Control Delay (s)	9.0	9.1	8.1	7.1	8.5
Approach Delay (s)	9.0	9.1	7.4		8.5
Approach LOS	A	A	A		A

Intersection Summary				
Delay	8.6			
Level of Service	A			
Intersection Capacity Utilization	41.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	163	10	10	102	30	10	10	10	20	10	10
Peak Hour 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
Hourly flow rate (vph)	10	163	10	10	102	30	10	10	10	20	10	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	183	142	30	40
Volume Left (vph)	10	10	10	20
Volume Right (vph)	10	30	10	10
Hadj (s)	0.00	-0.11	-0.13	-0.05
Departure Headway (s)	4.2	4.1	4.5	4.6
Degree Utilization, x	0.21	0.16	0.04	0.05
Capacity (veh/h)	835	847	734	720
Control Delay (s)	8.3	7.9	7.7	7.8
Approach Delay (s)	8.3	7.9	7.7	7.8
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.1	
Level of Service			A	
Intersection Capacity Utilization			24.2%	ICU Level of Service
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (veh/h)	10	370	10	10	360	20	10	20	20	40	20	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	370	10	10	360	20	10	20	20	40	20	10
Pedestrians		11			3			13			15	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	395			393			829	823	391	833	818	396
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	395			393			829	823	391	833	818	396
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			96	93	97	84	93	98
cM capacity (veh/h)	1154			1164			259	298	653	253	298	639

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	390	390	50	70
Volume Left	10	10	10	40
Volume Right	10	20	20	10
cSH	1154	1164	367	291
Volume to Capacity	0.01	0.01	0.14	0.24
Queue Length 95th (ft)	1	1	12	23
Control Delay (s)	0.3	0.3	16.3	21.3
Lane LOS	A	A	C	C
Approach Delay (s)	0.3	0.3	16.3	21.3
Approach LOS			C	C

Intersection Summary				
Average Delay			2.8	
Intersection Capacity Utilization			42.1%	ICU Level of Service
Analysis Period (min)			15	
				A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	34	1647	201	0	1722
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	34	1647	201	0	1722
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			154			137
pX, platoon unblocked	0.83	0.74			0.74	
vC, conflicting volume	2322	650			1848	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	431	0			920	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	458	803			547	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	34	659	659	530	574	574	574
Volume Left	0	0	0	0	0	0	0
Volume Right	34	0	0	201	0	0	0
cSH	803	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.04	0.39	0.39	0.31	0.34	0.34	0.34
Queue Length 95th (ft)	3	0	0	0	0	0	0
Control Delay (s)	9.7	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	9.7	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		46.3%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	1777	0	0	1840
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	1777	0	0	1840
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			424			204
pX, platoon unblocked	0.78					
vC, conflicting volume	2390	592			1777	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1793	592			1777	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	56	449			346	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	0	711	711	355	613	613	613
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.42	0.42	0.21	0.36	0.36	0.36
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	0.0	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		38.9%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	20	260	170	60	170	70	29	211	1663	148	130	1354
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			0.99			1.00	0.99		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.95			0.97			1.00	0.99		1.00	1.00
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1751			1735			1770	4985		1770	5060
Flt Permitted		0.98			0.67			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1718			1181			1770	4985		1770	5060
Peak-hour factor, PHF	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. Flow (vph)	20	260	170	60	170	70	29	211	1663	148	130	1354
RTOR Reduction (vph)	0	24	0	0	12	0	0	0	9	0	0	2
Lane Group Flow (vph)	0	426	0	0	288	0	0	240	1802	0	130	1382
Confl. Peds. (#/hr)	15		20	20		15				26		
Confl. Bikes (#/hr)			21			16				20		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		29.3			29.3			21.5	45.5		10.7	34.7
Effective Green, g (s)		29.3			29.3			21.5	45.5		10.7	34.7
Actuated g/C Ratio		0.29			0.29			0.22	0.46		0.11	0.35
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		503			346			380	2268		189	1755
v/s Ratio Prot								0.14	c0.36		0.07	c0.27
v/s Ratio Perm		c0.25			0.24							
v/c Ratio		0.85			0.83			0.63	0.79		0.69	0.79
Uniform Delay, d1		33.2			33.1			35.7	23.3		43.0	29.3
Progression Factor		1.00			1.00			0.50	0.37		1.00	1.00
Incremental Delay, d2		12.5			15.6			2.8	2.5		10.0	3.7
Delay (s)		45.7			48.6			20.7	11.1		53.0	33.0
Level of Service		D			D			C	B		D	C
Approach Delay (s)		45.7			48.6				12.2			34.7
Approach LOS		D			D				B			C

Intersection Summary			
HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	93.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	30
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	30
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	16
Confl. Bikes (#/hr)	20
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	488	20	11	230	20	20	20	33	20	20	40
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	488	20	11	230	20	20	20	33	20	20	40
Pedestrians		6			17			10			23	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked				0.96			0.96	0.96	0.96	0.96	0.96	
vC, conflicting volume	273			518			886	863	525	903	863	269
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	273			473			858	834	481	876	834	269
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			91	93	94	90	93	95
cM capacity (veh/h)	1249			1023			225	275	551	210	272	749

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	538	261	73	80
Volume Left	30	11	20	20
Volume Right	20	20	33	40
cSH	1249	1023	329	360
Volume to Capacity	0.02	0.01	0.22	0.22
Queue Length 95th (ft)	2	1	21	21
Control Delay (s)	0.7	0.5	19.0	17.8
Lane LOS	A	A	C	C
Approach Delay (s)	0.7	0.5	19.0	17.8
Approach LOS			C	C

Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	54.3%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
2020 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	381	60	31	161	50	50	560	43	30	550	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.99			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.97			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		1751			1761			1831			1853	
Flt Permitted		0.91			0.91			0.92			0.95	
Satd. Flow (perm)		1599			1615			1695			1773	
Peak-hour factor, PHF	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. Flow (vph)	90	381	60	31	161	50	50	560	43	30	550	40
RTOR Reduction (vph)	0	6	0	0	11	0	0	3	0	0	3	0
Lane Group Flow (vph)	0	525	0	0	231	0	0	650	0	0	617	0
Confl. Peds. (#/hr)	15		15	15		15	25		10	10		25
Confl. Bikes (#/hr)			20			13			41			29
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		29.0			29.0			43.0			43.0	
Effective Green, g (s)		29.0			29.0			43.0			43.0	
Actuated g/C Ratio		0.36			0.36			0.54			0.54	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		579			585			911			952	
v/s Ratio Prot												
v/s Ratio Perm		c0.33			0.14			c0.38			0.35	
v/c Ratio		0.91			0.39			0.71			0.65	
Uniform Delay, d1		24.2			19.0			13.9			13.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		20.4			2.0			4.7			3.4	
Delay (s)		44.6			21.0			18.6			16.5	
Level of Service		D			C			B			B	
Approach Delay (s)		44.6			21.0			18.6			16.5	
Approach LOS		D			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	99.7%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
2020 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	293	30	121	50	20	20	90	1006	70	20	996	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.98			0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes		0.99			0.99		0.99	1.00		0.99	1.00	
Frt		0.96			0.97		1.00	0.99		1.00	0.98	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1644			1696		1752	3482		1773	3471	
Flt Permitted		0.77			0.74		0.18	1.00		0.19	1.00	
Satd. Flow (perm)		1300			1285		323	3482		346	3471	
Peak-hour factor, PHF	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. Flow (vph)	293	30	121	50	20	20	90	1006	70	20	996	112
RTOR Reduction (vph)	0	16	0	0	12	0	0	5	0	0	9	0
Lane Group Flow (vph)	0	428	0	0	78	0	90	1071	0	20	1099	0
Confl. Peds. (#/hr)	15		34	34		15	33		23	23		33
Confl. Bikes (#/hr)			11			12			38			59
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		32.6			32.6		48.4	48.4		48.4	48.4	
Effective Green, g (s)		32.6			32.6		48.4	48.4		48.4	48.4	
Actuated g/C Ratio		0.36			0.36		0.54	0.54		0.54	0.54	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		470			465		173	1872		186	1866	
v/s Ratio Prot								0.31			c0.32	
v/s Ratio Perm		c0.33			0.06		0.28			0.06		
v/c Ratio		0.91			0.17		0.52	0.57		0.11	0.59	
Uniform Delay, d1		27.3			19.5		13.3	13.9		10.2	14.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		21.7			0.2		10.7	1.3		1.2	1.4	
Delay (s)		49.0			19.7		24.1	15.2		11.4	15.4	
Level of Service		D			B		C	B		B	B	
Approach Delay (s)		49.0			19.7			15.9			15.4	
Approach LOS		D			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	80.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (veh/h)	10	10	50	20	10	10	13	40	2000	20	10	20
Sign Control		Stop			Stop				Free			
Grade		0%			0%				0%			
Peak Hour 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
Hourly flow rate (vph)	10	10	50	20	10	10	0	40	2000	20	0	20
Pedestrians		7			25				15			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		1			2				1			
Right turn flare (veh)												
Median type									None			
Median storage veh)												
Upstream signal (ft)									299			
pX, platoon unblocked	0.88	0.88	0.76	0.88	0.88	0.76	0.00	0.76			0.00	0.76
vC, conflicting volume	2372	3735	550	2743	3735	702	0	1580			0	2045
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	255	1811	0	678	1811	0	0	648			0	1289
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			0.0	4.1
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	*4.6	*4.6	*4.6	0.0	2.2			0.0	2.2
p0 queue free %	98	84	94	89	83	98	0	94			0	95
cM capacity (veh/h)	460	61	812	179	58	586	0	704			0	404

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	70	40	540	1000	520	408	776	408
Volume Left	10	20	40	0	0	20	0	0
Volume Right	50	10	0	0	20	0	0	20
cSH	282	133	704	1700	1700	404	1700	1700
Volume to Capacity	0.25	0.30	0.06	0.59	0.31	0.05	0.46	0.24
Queue Length 95th (ft)	24	29	5	0	0	4	0	0
Control Delay (s)	21.9	43.2	1.5	0.0	0.0	1.6	0.0	0.0
Lane LOS	C	E	A			A		
Approach Delay (s)	21.9	43.2	0.4			0.4		
Approach LOS	C	E						

Intersection Summary				
Average Delay	1.3			
Intersection Capacity Utilization	89.7%	ICU Level of Service		E
Analysis Period (min)	15			

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
5: MLK Way & 54th Street

Children's Hospital
2020 PM Plus Phase 2

Movement	SBT	SBR
Lane Configurations		
Volume (veh/h)	1553	20
Sign Control	Free	
Grade	0%	
Peak Hour Factor	1.00	1.00
Hourly flow rate (vph)	1553	20
Pedestrians		
Lane Width (ft)		
Walking Speed (ft/s)		
Percent Blockage		
Right turn flare (veh)		
Median type	None	
Median storage veh)		
Upstream signal (ft)	294	
pX, platoon unblocked		
vC, conflicting volume		
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol		
tC, single (s)		
tC, 2 stage (s)		
tF (s)		
p0 queue free %		
cM capacity (veh/h)		

Direction, Lane #

HCM Unsignalized Intersection Capacity Analysis
6: Dover Street & 54th Street

Children's Hospital
2020 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	20	10	10	10	20	10	43	10	10	31	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	20	10	10	10	20	10	43	10	10	31	10
Pedestrians		16			11			8			4	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	169	156	60	163	156	63	57			64		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	169	156	60	163	156	63	57			64		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	97	99	99	99	98	99			99		
cM capacity (veh/h)	742	714	991	748	714	995	1540			1537		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	40	40	63	51
Volume Left	10	10	10	10
Volume Right	10	20	10	10
cSH	775	842	1540	1537
Volume to Capacity	0.05	0.05	0.01	0.01
Queue Length 95th (ft)	4	4	0	0
Control Delay (s)	9.9	9.5	1.2	1.5
Lane LOS	A	A	A	A
Approach Delay (s)	9.9	9.5	1.2	1.5
Approach LOS	A	A		

Intersection Summary				
Average Delay	4.8			
Intersection Capacity Utilization	20.4%	ICU Level of Service	A	
Analysis Period (min)	15			

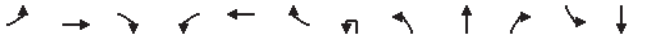
HCM Unsignalized Intersection Capacity Analysis
7: Shattuck Ave & 54th Street

Children's Hospital
2020 PM Plus Phase 2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	20	20	663	651	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	20	20	663	651	10
Pedestrians	33				2	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	3				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.82	0.77	0.77			
vC, conflicting volume	1394	689	694			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1092	445	452			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	96	98			
cM capacity (veh/h)	186	461	829			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	30	683	661
Volume Left	10	20	0
Volume Right	20	0	10
cSH	309	829	1700
Volume to Capacity	0.10	0.02	0.39
Queue Length 95th (ft)	8	2	0
Control Delay (s)	17.9	0.6	0.0
Lane LOS	C	A	
Approach Delay (s)	17.9	0.6	0.0
Approach LOS	C		

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	61.0%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	10	10	60	30	10	10	10	10	2053	59	20	1626
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.90			0.97			1.00	1.00		1.00	1.00
Flt Protected		0.99			0.97			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1631			1782			1770	5043		1787	5128
Flt Permitted		0.97			0.81			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1587			1490			1770	5043		1787	5128
Peak-hour factor, PHF	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. Flow (vph)	10	10	60	30	10	10	10	10	2053	59	20	1626
RTOR Reduction (vph)	0	50	0	0	8	0	0	0	2	0	0	0
Lane Group Flow (vph)	0	30	0	0	42	0	0	20	2110	0	20	1636
Confl. Peds. (#/hr)	11		6	6		11				42		
Confl. Bikes (#/hr)			6			3				17		
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		16.1			16.1			3.1	67.8		3.6	68.3
Effective Green, g (s)		16.1			16.1			3.1	67.8		3.6	68.3
Actuated g/C Ratio		0.16			0.16			0.03	0.68		0.04	0.68
Clearance Time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		255			239			54	3419		64	3502
v/s Ratio Prot								0.01	c0.42		0.01	c0.32
v/s Ratio Perm		0.02			c0.03							
v/c Ratio		0.12			0.17			0.37	0.62		0.31	0.47
Uniform Delay, d1		35.9			36.2			47.5	8.9		47.0	7.4
Progression Factor		1.00			1.02			1.43	0.18		0.78	0.48
Incremental Delay, d2		0.2			0.3			2.6	0.5		1.9	0.3
Delay (s)		36.1			37.1			70.7	2.1		38.5	3.9
Level of Service		D			D			E	A		D	A
Approach Delay (s)		36.1			37.1				2.8			4.3
Approach LOS		D			D				A			A

Intersection Summary			
HCM 2000 Control Delay	4.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: MLK Way & 53rd Street

Children's Hospital
2020 PM Plus Phase 2

Movement	SBR
Lane Configurations	
Volume (vph)	10
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	10
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	19
Confl. Bikes (#/hr)	21
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis
9: Dover Street & 53rd Street

Children's Hospital
2020 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	10	59	10	10	10	10	43	10	10	31	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	20	10	59	10	10	10	10	43	10	10	31	10
Pedestrians		33			13			6			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	178	175	75	207	175	67	74			66		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	178	175	75	207	175	67	74			66		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	99	94	98	99	99	99			99		
cM capacity (veh/h)	718	685	960	663	685	986	1496			1532		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	89	30	63	51
Volume Left	20	10	10	10
Volume Right	59	10	10	10
cSH	857	754	1496	1532
Volume to Capacity	0.10	0.04	0.01	0.01
Queue Length 95th (ft)	9	3	1	0
Control Delay (s)	9.7	10.0	1.2	1.5
Lane LOS	A	A	A	A
Approach Delay (s)	9.7	10.0	1.2	1.5
Approach LOS	A	A		

Intersection Summary				
Average Delay		5.6		
Intersection Capacity Utilization		24.9%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
10: MLK Way & 52nd Street

Children's Hospital
2020 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	71	130	100	163	103	227	50	90	1743	120	3	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.96			1.00	0.96		1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00			0.97	1.00		1.00	1.00			1.00
Frt	1.00	0.93			1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00			0.97	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1765	1685			1751	1526		1787	5063			1787
Flt Permitted	0.44	1.00			0.55	1.00		0.95	1.00			0.95
Satd. Flow (perm)	814	1685			994	1526		1787	5063			1787
Peak-hour factor, PHF	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. Flow (vph)	71	130	100	163	103	227	50	90	1743	120	3	151
RTOR Reduction (vph)	0	29	0	0	0	163	0	0	7	0	0	0
Lane Group Flow (vph)	71	201	0	0	266	64	0	140	1856	0	0	154
Confl. Peds. (#/hr)	21		80	80		21				13		
Confl. Bikes (#/hr)			12			6				20		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	28.2	28.2			28.2	28.2		12.0	40.8			17.5
Effective Green, g (s)	28.2	28.2			28.2	28.2		12.0	40.8			17.5
Actuated g/C Ratio	0.28	0.28			0.28	0.28		0.12	0.41			0.18
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	229	475			280	430		214	2065			312
v/s Ratio Prot		0.12						0.08	c0.37			0.09
v/s Ratio Perm	0.09				c0.27	0.04						
v/c Ratio	0.31	0.42			0.95	0.15		0.65	0.90			0.49
Uniform Delay, d1	28.2	29.3			35.2	26.9		42.0	27.7			37.2
Progression Factor	1.00	1.00			1.21	3.22		0.97	1.06			0.56
Incremental Delay, d2	0.3	0.2			37.3	0.1		2.1	2.7			0.4
Delay (s)	28.5	29.5			79.9	86.7		42.7	32.1			21.3
Level of Service	C	C			E	F		D	C			C
Approach Delay (s)		29.3			83.0				32.8			
Approach LOS		C			F				C			

Intersection Summary				
HCM 2000 Control Delay	29.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	106.5%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1562	10
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5128	
Flt Permitted	1.00	
Satd. Flow (perm)	5128	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1562	10
RTOR Reduction (vph)	1	0
Lane Group Flow (vph)	1571	0
Confl. Peds. (#/hr)		17
Confl. Bikes (#/hr)		23
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	45.8	
Effective Green, g (s)	45.8	
Actuated g/C Ratio	0.46	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2348	
v/s Ratio Prot	c0.31	
v/s Ratio Perm		
v/c Ratio	0.67	
Uniform Delay, d1	21.2	
Progression Factor	0.31	
Incremental Delay, d2	1.4	
Delay (s)	7.9	
Level of Service	A	
Approach Delay (s)	9.1	
Approach LOS	A	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	388	2	5	410	2	12	1	7	0	4	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.94			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.95			0.87	
Flt Protected		1.00			1.00			0.97			1.00	
Satd. Flow (prot)		1859			1896			1417			1640	
Flt Permitted		1.00			1.00			0.92			1.00	
Satd. Flow (perm)		1856			1890			1339			1640	
Peak-hour factor, PHF	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. Flow (vph)	3	388	2	5	410	2	12	1	7	0	4	59
RTOR Reduction (vph)	0	1	0	0	1	0	0	4	0	0	32	0
Lane Group Flow (vph)	0	392	0	0	416	0	0	16	0	0	31	0
Confl. Peds. (#/hr)			77	77		33			271	271		
Confl. Bikes (#/hr)			13			8						2
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		21.0			21.0			23.0			23.0	
Effective Green, g (s)		21.0			21.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.42			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		779			793			615			754	
v/s Ratio Prot											c0.02	
v/s Ratio Perm		0.21			c0.22			0.01				
v/c Ratio		0.50			0.53			0.03			0.04	
Uniform Delay, d1		10.7			10.8			7.4			7.4	
Progression Factor		1.06			1.00			1.00			1.00	
Incremental Delay, d2		1.9			2.5			0.1			0.1	
Delay (s)		13.2			13.3			7.5			7.5	
Level of Service		B			B			A			A	
Approach Delay (s)		13.2			13.3			7.5			7.5	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	331	45	20	336	40	70	5	47	71	2	28
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	331	45	20	336	40	70	5	47	71	2	28
Pedestrians		49			10			46			20	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		4			1			4			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.88			0.84			0.90	0.90	0.84	0.90	0.90	0.88
vC, conflicting volume	396			422			934	896	410	889	898	425
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	243			222			571	529	208	522	532	276
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	97			98			77	99	93	80	99	96
cM capacity (veh/h)	1138			1097			309	363	654	352	373	636

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	406	396	122	101
Volume Left	30	20	70	71
Volume Right	45	40	47	28
cSH	1138	1097	391	402
Volume to Capacity	0.03	0.02	0.31	0.25
Queue Length 95th (ft)	2	1	33	25
Control Delay (s)	0.9	0.6	18.3	16.9
Lane LOS	A	A	C	C
Approach Delay (s)	0.9	0.6	18.3	16.9
Approach LOS			C	C

Intersection Summary				
Average Delay	4.4			
Intersection Capacity Utilization	50.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	451	0	0	401	1060	0	1050	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	451	0	0	401	1060	0	1050	0	0
Pedestrians							43			
Lane Width (ft)							12.0			
Walking Speed (ft/s)							4.0			
Percent Blockage							4			
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.81						0.81		0.81	0.81
vC, conflicting volume	1461			494			1955	268	1676	895
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1112			494			1718	268	1376	417
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	509			1028			70	700	0	413

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	226	226	267	487	707	525	525
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	353	707	525	525
cSH	1700	1700	1700	1700	1700	700	700
Volume to Capacity	0.13	0.13	0.16	0.29	0.42	0.75	0.75
Queue Length 95th (ft)	0	0	0	0	0	171	171
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	23.8	23.8
Lane LOS						C	C
Approach Delay (s)	0.0		0.0			23.8	
Approach LOS						C	

Intersection Summary				
Average Delay	8.5			
Intersection Capacity Utilization	56.5%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	50	323	938	190	60	890	150	160	240	60	150	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.98		1.00	0.99		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			0.99
Frt		1.00	0.97		1.00	0.98		1.00	0.97			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.98
Satd. Flow (prot)		1787	4928		1805	5014		1752	1764			1712
Flt Permitted		0.95	1.00		0.95	1.00		0.29	1.00			0.69
Satd. Flow (perm)		1787	4928		1805	5014		527	1764			1218
Peak-hour factor, PHF	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. Flow (vph)	50	323	938	190	60	890	150	160	240	60	150	150
RTOR Reduction (vph)	0	0	27	0	0	21	0	0	8	0	0	0
Lane Group Flow (vph)	0	373	1101	0	60	1019	0	160	292	0	0	300
Confl. Peds. (#/hr)				19	19		15			29	29	
Confl. Bikes (#/hr)				17			11			39		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		33.5	55.1		5.2	26.8		35.7	35.7			26.2
Effective Green, g (s)		33.5	55.1		5.2	26.8		35.7	35.7			26.2
Actuated g/C Ratio		0.30	0.50		0.05	0.24		0.32	0.32			0.24
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		544	2468		85	1221		232	572			290
v/s Ratio Prot		c0.21	0.22		0.03	c0.20		c0.03	0.17			
v/s Ratio Perm								0.19				c0.25
v/c Ratio		0.69	0.45		0.71	0.83		0.69	0.51			1.03
Uniform Delay, d1		33.6	17.6		51.6	39.5		32.2	30.1			41.9
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Incremental Delay, d2		6.9	0.6		23.3	6.8		8.3	3.2			62.1
Delay (s)		40.5	18.2		75.0	46.3		40.5	33.3			104.0
Level of Service		D	B		E	D		D	C			F
Approach Delay (s)			23.8			47.9			35.8			66.8
Approach LOS			C			D			D			E

Intersection Summary			
HCM 2000 Control Delay	40.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	104.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: 52nd Street & Shattuck Ave

Children's Hospital
2020 PM Plus Phase 2

Movement	SBR
Lane Configurations	
Volume (vph)	361
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.93
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1400
Flt Permitted	1.00
Satd. Flow (perm)	1400
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	361
RTOR Reduction (vph)	275
Lane Group Flow (vph)	86
Confl. Peds. (#/hr)	24
Confl. Bikes (#/hr)	36
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	26.2
Effective Green, g (s)	26.2
Actuated g/C Ratio	0.24
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	333
v/s Ratio Prot	
v/s Ratio Perm	0.06
v/c Ratio	0.26
Uniform Delay, d1	34.0
Progression Factor	1.00
Incremental Delay, d2	1.9
Delay (s)	35.9
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

Fehr & Peers

Synchro 8 Report

HCM Signalized Intersection Capacity Analysis
15: Telegraph Ave & 52nd Street/Claremont Ave

Children's Hospital
2020 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	20	20	140	80	180	20	976	270	140	721	306
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.94			0.98		1.00	0.91	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.95		1.00	0.90			0.97		1.00	0.96	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1642		1698	1513			3773		1770	3083	
Flt Permitted		0.98		0.95	1.00			0.93		0.95	1.00	
Satd. Flow (perm)		1642		1698	1513			3499		1770	3083	
Peak-hour factor, PHF	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. Flow (vph)	20	20	20	140	80	180	20	976	270	140	721	306
RTOR Reduction (vph)	0	19	0	0	73	0	0	21	0	0	40	0
Lane Group Flow (vph)	0	41	0	126	201	0	0	1245	0	140	987	0
Confl. Peds. (#/hr)	45					45	91		29			91
Confl. Bikes (#/hr)			2			13			46			63
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		6.2		18.0	18.0			45.9		11.9	62.3	
Effective Green, g (s)		6.2		18.0	18.0			45.9		11.9	62.3	
Actuated g/C Ratio		0.06		0.18	0.18			0.46		0.12	0.62	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		101		305	272			1606		210	1920	
v/s Ratio Prot		c0.03		0.07	c0.13					c0.08	0.32	
v/s Ratio Perm								c0.36				
v/c Ratio		0.41		0.41	0.74			0.78		0.67	0.51	
Uniform Delay, d1		45.1		36.3	38.8			22.7		42.2	10.5	
Progression Factor		1.80		1.00	1.00			0.57		1.00	1.00	
Incremental Delay, d2		1.2		0.9	10.0			2.5		7.8	1.0	
Delay (s)		82.7		37.2	48.8			15.4		49.9	11.4	
Level of Service		F		D	D			B		D	B	
Approach Delay (s)		82.7			45.2			15.4			16.1	
Approach LOS		F			D			B			B	

Intersection Summary				
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	100.3%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
16: Telegraph Ave & 51St Street

Children's Hospital
2020 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	336	664	108	70	521	240	103	690	120	280	541	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.97		1.00	0.98		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3377		1787	3299		1719	3293		1752	3363	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3377		1787	3299		1719	3293		1752	3363	
Peak-hour factor, PHF	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. Flow (vph)	336	664	108	70	521	240	103	690	120	280	541	60
RTOR Reduction (vph)	0	13	0	0	53	0	0	14	0	0	9	0
Lane Group Flow (vph)	336	759	0	70	708	0	103	796	0	280	592	0
Confl. Peds. (#/hr)			68			50			75			120
Confl. Bikes (#/hr)			11			20			45			71
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.6	29.5		8.0	23.4		8.2	33.0		13.0	38.8	
Effective Green, g (s)	14.6	29.5		8.0	23.4		8.2	33.0		13.0	38.8	
Actuated g/C Ratio	0.15	0.29		0.08	0.23		0.08	0.33		0.13	0.39	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	496	996		142	771		140	1086		227	1304	
v/s Ratio Prot	c0.10	0.22		0.04	c0.21		0.06	c0.24		c0.16	0.18	
v/s Ratio Perm												
v/c Ratio	0.68	0.76		0.49	0.92		0.74	0.73		1.23	0.45	
Uniform Delay, d1	40.5	32.1		44.1	37.4		44.8	29.6		43.5	22.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.22	0.70	
Incremental Delay, d2	3.7	5.5		2.7	17.7		18.1	4.4		134.1	1.0	
Delay (s)	44.1	37.6		46.7	55.1		62.9	34.0		187.0	16.9	
Level of Service	D	D		D	E		E	C		F	B	
Approach Delay (s)		39.6			54.4			37.3			71.0	
Approach LOS		D			D			D			E	

Intersection Summary				
HCM 2000 Control Delay	49.7	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	85.8%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
17: SB SR-24 On-Ramp & MLK Way & NB SR-24 Off-Ramp

Children's Hospital
2020 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	301	0	0	0	0	1682	0	0	0	0	1662	243
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	301	0	0	0	0	1682	0	0	0	0	1662	243
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	301	0	0	0	0	1682	0	0	0	0	1662	243
Confl. Peds. (#/hr)				3								
Confl. Bikes (#/hr)									12			
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	13.0					50.0					29.0	50.0
Effective Green, g (s)	13.0					50.0					29.0	50.0
Actuated g/C Ratio	0.26					1.00					0.58	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	850					1627					2072	2814
v/s Ratio Prot	0.09										0.46	0.09
v/s Ratio Perm						c1.03						
v/c Ratio	0.35					1.03					0.80	0.09
Uniform Delay, d1	15.1					25.0					8.2	0.0
Progression Factor	1.00					1.00					2.80	1.00
Incremental Delay, d2	1.2					31.5					2.6	0.0
Delay (s)	16.2					56.5					25.6	0.0
Level of Service	B					E					C	A
Approach Delay (s)		16.2			56.5			0.0			22.4	
Approach LOS		B			E			A			C	

Intersection Summary				
HCM 2000 Control Delay	36.7	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.23			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	61.2%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

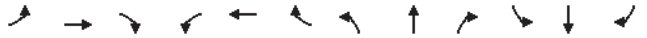
HCM Unsignalized Intersection Capacity Analysis
18: West Street & 52nd Street

Children's Hospital
2020 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	141	10	90	113	0	50	0	140	10	60	10
Peak Hour 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
Hourly flow rate (vph)	0	141	10	90	113	0	50	0	140	10	60	10

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	151	203	50	140	80
Volume Left (vph)	0	90	50	0	10
Volume Right (vph)	10	0	0	140	10
Hadj (s)	-0.02	0.12	0.50	-0.70	-0.02
Departure Headway (s)	4.8	4.9	6.0	4.8	5.1
Degree Utilization, x	0.20	0.28	0.08	0.19	0.11
Capacity (veh/h)	694	693	566	702	638
Control Delay (s)	9.0	9.7	8.3	7.7	8.8
Approach Delay (s)	9.0	9.7	7.8		8.8
Approach LOS	A	A	A		A

Intersection Summary				
Delay	8.9			
Level of Service	A			
Intersection Capacity Utilization	42.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	131	10	10	113	50	10	10	10	20	10	10
Peak Hour 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
Hourly flow rate (vph)	10	131	10	10	113	50	10	10	10	20	10	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	151	173	30	40
Volume Left (vph)	10	10	10	20
Volume Right (vph)	10	50	10	10
Hadj (s)	-0.01	-0.16	-0.13	-0.05
Departure Headway (s)	4.2	4.1	4.5	4.6
Degree Utilization, x	0.18	0.20	0.04	0.05
Capacity (veh/h)	829	865	736	722
Control Delay (s)	8.1	8.0	7.7	7.8
Approach Delay (s)	8.1	8.0	7.7	7.8
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.0	
Level of Service			A	
Intersection Capacity Utilization			23.9%	ICU Level of Service
Analysis Period (min)			15	
				A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (veh/h)	20	380	10	20	381	40	10	20	40	40	10	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	20	380	10	20	381	40	10	20	40	40	10	20
Pedestrians		7						10			4	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		1						1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	425			400			908	900	395	920	885	412
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	425			400			908	900	395	920	885	412
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			96	93	94	81	96	97
cM capacity (veh/h)	1136			1160			231	268	653	214	271	634

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	410	441	70	70
Volume Left	20	20	10	40
Volume Right	10	40	40	20
cSH	1136	1160	391	274
Volume to Capacity	0.02	0.02	0.18	0.26
Queue Length 95th (ft)	1	1	16	25
Control Delay (s)	0.6	0.5	16.2	22.6
Lane LOS	A	A	C	C
Approach Delay (s)	0.6	0.5	16.2	22.6
Approach LOS			C	C

Intersection Summary				
Average Delay			3.2	
Intersection Capacity Utilization			47.4%	ICU Level of Service
Analysis Period (min)			15	
				A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	123	2010	34	0	1726
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	123	2010	34	0	1726
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			154			137
pX, platoon unblocked	0.73	0.66			0.66	
vC, conflicting volume	2602	687			2044	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	531	0			762	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	83			100	
cM capacity (veh/h)	350	712			556	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	123	804	804	436	575	575	575
Volume Left	0	0	0	0	0	0	0
Volume Right	123	0	0	34	0	0	0
cSH	712	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.17	0.47	0.47	0.26	0.34	0.34	0.34
Queue Length 95th (ft)	16	0	0	0	0	0	0
Control Delay (s)	11.1	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	11.1	0.0			0.0		
Approach LOS	B						

Intersection Summary				
Average Delay		0.4		
Intersection Capacity Utilization		53.9%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	1983	0	0	1875
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	1983	0	0	1875
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			424			204
pX, platoon unblocked	0.76					
vC, conflicting volume	2608	661			1983	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2011	661			1983	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	39	405			287	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	0	793	793	397	625	625	625
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.47	0.47	0.23	0.37	0.37	0.37
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	0.0	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		41.6%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection Sign configuration not allowed in HCM analysis.

Appendix J

LOS Calculation Worksheets – 2035 Plus Phase 1 Conditions

FEHR PEERS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	20	200	250	60	270	100	21	180	1441	70	160	1522
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			0.99			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.93			0.97			1.00	0.99		1.00	0.99
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1702			1741			1770	5029		1770	5037
Flt Permitted		0.98			0.79			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1663			1383			1770	5029		1770	5037
Peak-hour factor, PHF	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. Flow (vph)	20	200	250	60	270	100	21	180	1441	70	160	1522
RTOR Reduction (vph)	0	50	0	0	13	0	0	0	5	0	0	5
Lane Group Flow (vph)	0	420	0	0	417	0	0	201	1506	0	160	1587
Confl. Peds. (#/hr)	11		21	21		11				32		
Confl. Bikes (#/hr)			24			23				9		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		29.4			29.4			13.5	38.6		7.5	32.6
Effective Green, g (s)		29.4			29.4			13.5	38.6		7.5	32.6
Actuated g/C Ratio		0.33			0.33			0.15	0.43		0.08	0.36
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		543			451			265	2156		147	1824
v/s Ratio Prot								0.11	c0.30		0.09	c0.32
v/s Ratio Perm		0.25			c0.30							
v/c Ratio		0.77			0.92			0.76	0.70		1.09	0.87
Uniform Delay, d1		27.3			29.2			36.7	21.0		41.2	26.7
Progression Factor		1.00			1.00			0.54	0.29		1.00	1.00
Incremental Delay, d2		6.8			24.5			10.5	1.7		99.9	6.0
Delay (s)		34.1			53.8			30.3	7.8		141.1	32.7
Level of Service		C			D			C	A		F	C
Approach Delay (s)		34.1			53.8				10.4			42.6
Approach LOS		C			D				B			D

Intersection Summary			
HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	99.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: MLK Way & 55th Street

Children's Hospital
2035 AM Plus Phase 1

Movement	SBR
Lane Configurations	
Volume (vph)	70
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	70
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	18
Confl. Bikes (#/hr)	11
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Fehr & Peers

Synchro 8 Report

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	380	10	30	370	10	10	10	20	10	10	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	380	10	30	370	10	10	10	20	10	10	30
Pedestrians		14			30			23			9	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			3			2			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked	0.87						0.87	0.87		0.87	0.87	0.87
vC, conflicting volume	389			413			952	917	438	944	917	398
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	229			413			873	833	438	864	833	239
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			97			95	96	97	95	96	96
cM capacity (veh/h)	1147			1113			201	247	596	204	245	684

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	420	410	40	50
Volume Left	30	30	10	10
Volume Right	10	10	20	30
cSH	1147	1113	323	374
Volume to Capacity	0.03	0.03	0.12	0.13
Queue Length 95th (ft)	2	2	10	11
Control Delay (s)	0.8	0.9	17.7	16.1
Lane LOS	A	A	C	C
Approach Delay (s)	0.8	0.9	17.7	16.1
Approach LOS			C	C

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	45.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	270	80	40	290	70	50	520	30	30	620	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.98			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.97			0.98			0.99			0.99	
Flt Protected		0.99			1.00			1.00			1.00	
Satd. Flow (prot)		1717			1774			1837			1852	
Flt Permitted		0.78			0.92			0.91			0.96	
Satd. Flow (perm)		1347			1633			1675			1787	
Peak-hour factor, PHF	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. Flow (vph)	80	270	80	40	290	70	50	520	30	30	620	50
RTOR Reduction (vph)	0	10	0	0	10	0	0	2	0	0	3	0
Lane Group Flow (vph)	0	420	0	0	390	0	0	598	0	0	697	0
Confl. Peds. (#/hr)	9		20	20		9	11		26	26		11
Confl. Bikes (#/hr)			33			15			20			36
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		25.0			25.0			47.0			47.0	
Effective Green, g (s)		25.0			25.0			47.0			47.0	
Actuated g/C Ratio		0.31			0.31			0.59			0.59	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		420			510			984			1049	
v/s Ratio Prot												
v/s Ratio Perm		c0.31			0.24			0.36			c0.39	
v/c Ratio		1.00			0.77			0.61			0.66	
Uniform Delay, d1		27.5			24.9			10.6			11.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		43.7			10.5			2.8			3.3	
Delay (s)		71.2			35.3			13.4			14.5	
Level of Service		E			D			B			B	
Approach Delay (s)		71.2			35.3			13.4			14.5	
Approach LOS		E			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	29.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	95.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
2035 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	20	100	50	10	10	80	1122	60	40	1344	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	0.99		1.00	0.98	
Flpb, ped/bikes		1.00			0.99		1.00	1.00		0.99	1.00	
Frt		0.96			0.98		1.00	0.99		1.00	0.97	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1647			1711		1770	3493		1775	3424	
Flt Permitted		0.77			0.72		0.10	1.00		0.18	1.00	
Satd. Flow (perm)		1311			1279		181	3493		330	3424	
Peak-hour factor, PHF	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. Flow (vph)	190	20	100	50	10	10	80	1122	60	40	1344	300
RTOR Reduction (vph)	0	19	0	0	7	0	0	5	0	0	23	0
Lane Group Flow (vph)	0	291	0	0	63	0	80	1177	0	40	1621	0
Confl. Peds. (#/hr)	9		17	17		9	20		26	26		20
Confl. Bikes (#/hr)			23			23			65			41
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		19.8			19.8		41.2	41.2		41.2	41.2	
Effective Green, g (s)		19.8			19.8		41.2	41.2		41.2	41.2	
Actuated g/C Ratio		0.28			0.28		0.59	0.59		0.59	0.59	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		370			361		106	2055		194	2015	
v/s Ratio Prot								0.34			c0.47	
v/s Ratio Perm		c0.22			0.05		0.44			0.12		
v/c Ratio		0.79			0.17		0.75	0.57		0.21	0.80	
Uniform Delay, d1		23.1			18.9		10.7	8.9		6.7	11.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		10.5			0.2		38.7	1.2		2.4	3.5	
Delay (s)		33.6			19.2		49.3	10.1		9.1	14.8	
Level of Service		C			B		D	B		A	B	
Approach Delay (s)		33.6			19.2			12.6			14.7	
Approach LOS		C			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	82.5%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
5: MLK Way & 54th Street

Children's Hospital
2035 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	10	10	60	10	10	10	10	30	1682	20	10	1793
Sign Control		Stop			Stop				Free			Free
Grade		0%			0%				0%			0%
Peak Hour 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
Hourly flow rate (vph)	10	10	60	10	10	10	0	30	1682	20	10	1793
Pedestrians		11			9				12			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		1			1				1			
Right turn flare (veh)												
Median type									None			None
Median storage veh)												
Upstream signal (ft)									299			294
pX, platoon unblocked	0.81	0.81	0.71	0.81	0.81	0.81	0.00	0.71			0.81	
vC, conflicting volume	2465	3600	626	2456	3595	580	0	1814			1711	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	394	1803	0	383	1797	0	0	724			1063	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	*5.0	*5.0	*5.0	0.0	2.2			2.2	
p0 queue free %	97	83	92	96	82	98	0	95			98	
cM capacity (veh/h)	347	59	761	249	56	580	0	616			529	

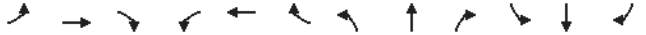
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	80	30	450	841	440	458	896	458
Volume Left	10	10	30	0	0	10	0	0
Volume Right	60	10	0	0	20	0	0	10
cSH	290	128	616	1700	1700	529	1700	1700
Volume to Capacity	0.28	0.23	0.05	0.49	0.26	0.02	0.53	0.27
Queue Length 95th (ft)	27	21	4	0	0	1	0	0
Control Delay (s)	22.1	41.6	1.4	0.0	0.0	0.6	0.0	0.0
Lane LOS	C	E	A			A		
Approach Delay (s)	22.1	41.6	0.4			0.1		
Approach LOS	C	E						

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	76.7%	ICU Level of Service	D	
Analysis Period (min)	15			

* User Entered Value

Movement	SBR
Lane Configurations	
Volume (veh/h)	10
Sign Control	
Grade	
Peak Hour Factor	1.00
Hourly flow rate (vph)	10
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	
tC, single (s)	
tC, 2 stage (s)	
tF (s)	
p0 queue free %	
cM capacity (veh/h)	

Direction, Lane #	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	10	10	10	10	10	10	20	20	10	40	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	10	10	10	10	10	10	20	20	10	40	10
Pedestrians		15			21			3			9	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	154	161	63	154	156	60	65			61		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	154	161	63	154	156	60	65			61		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	99	99	99	99	99			99		
cM capacity (veh/h)	759	704	992	759	708	986	1531			1528		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	30	30	50	60
Volume Left	10	10	10	10
Volume Right	10	10	20	10
cSH	801	801	1531	1528
Volume to Capacity	0.04	0.04	0.01	0.01
Queue Length 95th (ft)	3	3	0	0
Control Delay (s)	9.7	9.7	1.5	1.3
Lane LOS	A	A	A	A
Approach Delay (s)	9.7	9.7	1.5	1.3
Approach LOS	A	A		

Intersection Summary					
Average Delay		4.3			
Intersection Capacity Utilization		21.7%	ICU Level of Service		A
Analysis Period (min)		15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	20	20	590	710	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	20	20	590	710	10
Pedestrians	14			3	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.76	0.75	0.75			
vC, conflicting volume	1361	732	734			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1281	478	480			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	95	98			
cM capacity (veh/h)	134	438	803			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	30	610	720
Volume Left	10	20	0
Volume Right	20	0	10
cSH	250	803	1700
Volume to Capacity	0.12	0.02	0.42
Queue Length 95th (ft)	10	2	0
Control Delay (s)	21.4	0.7	0.0
Lane LOS	C	A	
Approach Delay (s)	21.4	0.7	0.0
Approach LOS	C		

Intersection Summary			
Average Delay		0.8	
Intersection Capacity Utilization		58.2%	ICU Level of Service B
Analysis Period (min)		15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	50	20	10	20	30	1712	47	20	1853	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.98			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.90			0.95		1.00	1.00		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1639			1740		1770	5055		1787	5129	
Flt Permitted		0.96			0.88		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1589			1562		1770	5055		1787	5129	
Peak-hour factor, PHF	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. Flow (vph)	10	10	50	20	10	20	30	1712	47	20	1853	10
RTOR Reduction (vph)	0	41	0	0	16	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	29	0	0	34	0	30	1757	0	20	1863	0
Confl. Peds. (#/hr)	11		20	20		11			20			30
Confl. Bikes (#/hr)									8			20
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		15.8			15.8		4.5	58.1		3.6	57.2	
Effective Green, g (s)		15.8			15.8		4.5	58.1		3.6	57.2	
Actuated g/C Ratio		0.18			0.18		0.05	0.65		0.04	0.64	
Clearance Time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		278			274		88	3263		71	3259	
v/s Ratio Prot							0.02	c0.35		0.01	c0.36	
v/s Ratio Perm		0.02			c0.02							
v/c Ratio		0.10			0.12		0.34	0.54		0.28	0.57	
Uniform Delay, d1		31.2			31.3		41.3	8.7		41.9	9.4	
Progression Factor		1.00			1.01		1.17	0.50		0.50	0.26	
Incremental Delay, d2		0.2			0.2		1.7	0.5		1.2	0.4	
Delay (s)		31.3			31.7		50.2	4.8		22.4	2.9	
Level of Service		C			C		D	A		C	A	
Approach Delay (s)		31.3			31.7			5.5			3.1	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	10	37	10	10	10	20	30	20	10	30	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	20	10	37	10	10	10	20	30	20	10	30	20
Pedestrians		33			32			3			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			3			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	191	215	76	217	215	75	83			82		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	191	215	76	217	215	75	83			82		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	98	96	98	98	99	99			99		
cM capacity (veh/h)	693	637	961	648	637	963	1485			1487		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	67	30	70	60
Volume Left	20	10	20	10
Volume Right	37	10	20	20
cSH	807	722	1485	1487
Volume to Capacity	0.08	0.04	0.01	0.01
Queue Length 95th (ft)	7	3	1	1
Control Delay (s)	9.9	10.2	2.2	1.3
Lane LOS	A	B	A	A
Approach Delay (s)	9.9	10.2	2.2	1.3
Approach LOS	A	B		

Intersection Summary				
Average Delay		5.3		
Intersection Capacity Utilization		23.8%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	58	92	120	92	110	297	60	110	1585	101	33	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.95			1.00	0.97		1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00			0.98	1.00		1.00	1.00			1.00
Frt	1.00	0.92			1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00			0.98	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1770	1642			1784	1534		1787	5081			1787
Flt Permitted	0.54	1.00			0.65	1.00		0.95	1.00			0.95
Satd. Flow (perm)	1006	1642			1186	1534		1787	5081			1787
Peak-hour factor, PHF	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. Flow (vph)	58	92	120	92	110	297	60	110	1585	101	33	119
RTOR Reduction (vph)	0	59	0	0	0	177	0	0	7	0	0	0
Lane Group Flow (vph)	58	153	0	0	202	120	0	170	1679	0	0	152
Confl. Peds. (#/hr)	15		74	74		15				11		
Confl. Bikes (#/hr)			9			8				2		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	23.5	23.5			23.5	23.5		7.5	40.5			12.5
Effective Green, g (s)	23.5	23.5			23.5	23.5		7.5	40.5			12.5
Actuated g/C Ratio	0.26	0.26			0.26	0.26		0.08	0.45			0.14
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	262	428			309	400		148	2286			248
v/s Ratio Prot		0.09						c0.10	c0.33			0.09
v/s Ratio Perm	0.06				c0.17	0.08						
v/c Ratio	0.22	0.36			0.65	0.30		1.15	0.73			0.61
Uniform Delay, d1	26.1	27.1			29.6	26.6		41.2	20.3			36.5
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.09			0.85
Incremental Delay, d2	0.2	0.2			3.8	0.2		93.1	0.8			2.7
Delay (s)	26.2	27.3			33.4	26.8		134.4	23.0			33.9
Level of Service	C	C			C	C		F	C			C
Approach Delay (s)		27.1			29.5				33.2			
Approach LOS		C			C				C			

Intersection Summary				
HCM 2000 Control Delay		25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio		0.74		
Actuated Cycle Length (s)		90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization		103.9%	ICU Level of Service	G
Analysis Period (min)		15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1761	0
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5136	
Flt Permitted	1.00	
Satd. Flow (perm)	5136	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1761	0
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1761	0
Confl. Peds. (#/hr)		15
Confl. Bikes (#/hr)		15
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	45.0	
Effective Green, g (s)	45.0	
Actuated g/C Ratio	0.50	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2568	
v/s Ratio Prot	c0.34	
v/s Ratio Perm		
v/c Ratio	0.69	
Uniform Delay, d1	17.1	
Progression Factor	0.87	
Incremental Delay, d2	1.3	
Delay (s)	16.2	
Level of Service	B	
Approach Delay (s)	17.6	
Approach LOS	B	

Intersection Summary			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	280	8	6	457	2	15	7	10	0	2	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.94			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.96			0.88	
Flt Protected		1.00			1.00			0.98			1.00	
Satd. Flow (prot)		3505			3600			1434			1655	
Flt Permitted		0.95			0.95			0.94			1.00	
Satd. Flow (perm)		3345			3426			1374			1655	
Peak-hour factor, PHF	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. Flow (vph)	4	280	8	6	457	2	15	7	10	0	2	15
RTOR Reduction (vph)	0	4	0	0	1	0	0	5	0	0	8	0
Lane Group Flow (vph)	0	288	0	0	464	0	0	27	0	0	9	0
Confl. Peds. (#/hr)	26		83	83		26			303	303		
Confl. Bikes (#/hr)			9			8						2
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Prot	NA		Perm	NA		Perm	NA			NA	
Protected Phases	5	2			6			4			8	
Permitted Phases				6			4			8		
Actuated Green, G (s)		21.0			14.0			23.0			23.0	
Effective Green, g (s)		21.0			14.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.28			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1417			959			632			761	
v/s Ratio Prot		c0.02									0.01	
v/s Ratio Perm		0.07			c0.14			c0.02				
v/c Ratio		0.20			0.48			0.04			0.01	
Uniform Delay, d1		9.2			15.0			7.4			7.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.3			1.7			0.1			0.0	
Delay (s)		9.5			16.7			7.6			7.4	
Level of Service		A			B			A			A	
Approach Delay (s)		9.5			16.7			7.6			7.4	
Approach LOS		A			B			A			A	

Intersection Summary					
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.21				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	9.0		
Intersection Capacity Utilization	42.8%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	267	1	11	435	50	3	0	7	45	3	32
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	267	1	11	435	50	3	0	7	45	3	32
Pedestrians		30			15			18			35	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			1			1			3	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.83			0.92			0.87	0.87	0.92	0.87	0.87	0.83
vC, conflicting volume	520			286			891	888	300	866	863	525
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	315			175			582	578	191	554	550	321
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	97			99			99	100	99	87	99	94
cM capacity (veh/h)	995			1270			303	332	740	345	356	567

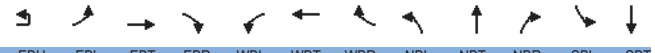
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	298	496	10	80
Volume Left	30	11	3	45
Volume Right	1	50	7	32
cSH	995	1270	517	410
Volume to Capacity	0.03	0.01	0.02	0.20
Queue Length 95th (ft)	2	1	1	18
Control Delay (s)	1.2	0.3	12.1	15.9
Lane LOS	A	A	B	C
Approach Delay (s)	1.2	0.3	12.1	15.9
Approach LOS			B	C

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	48.3%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	322	0	0	505	1270	0	1100	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	322	0	0	505	1270	0	1100	0	0
Pedestrians							36			
Lane Width (ft)							12.0			
Walking Speed (ft/s)							4.0			
Percent Blockage							3			
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.80						0.80		0.80	0.80
vC, conflicting volume	1775			358			2133	197	1766	863
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1465			358			1914	197	1454	322
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	365			1161			52	784	0	460

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	161	161	337	592	847	550	550
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	423	847	550	550
cSH	1700	1700	1700	1700	1700	784	784
Volume to Capacity	0.09	0.09	0.20	0.35	0.50	0.70	0.70
Queue Length 95th (ft)	0	0	0	0	0	147	147
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	19.6	19.6
Lane LOS						C	C
Approach Delay (s)	0.0		0.0			19.6	
Approach LOS						C	

Intersection Summary				
Average Delay	6.8			
Intersection Capacity Utilization	57.1%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	50	300	912	160	50	1135	150	180	150	60	140	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.99		1.00	0.99		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.98		1.00	0.98		1.00	0.96			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.98
Satd. Flow (prot)		1787	4958		1805	5070		1752	1748			1731
Flt Permitted		0.95	1.00		0.95	1.00		0.31	1.00			0.77
Satd. Flow (perm)		1787	4958		1805	5070		578	1748			1356
Peak-hour factor, PHF	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. Flow (vph)	50	300	912	160	50	1135	150	180	150	60	140	190
RTOR Reduction (vph)	0	0	24	0	0	18	0	0	16	0	0	0
Lane Group Flow (vph)	0	350	1048	0	50	1267	0	180	194	0	0	330
Confl. Peds. (#/hr)				18			8			15	15	
Confl. Bikes (#/hr)				18			2			15		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		21.5	34.6		5.5	18.6		35.9	35.9			25.4
Effective Green, g (s)		21.5	34.6		5.5	18.6		35.9	35.9			25.4
Actuated g/C Ratio		0.24	0.38		0.06	0.21		0.40	0.40			0.28
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		426	1906		110	1047		315	697			382
v/s Ratio Prot		c0.20	0.21		0.03	c0.25		c0.04	0.11			
v/s Ratio Perm								0.19				c0.24
v/c Ratio		0.82	0.55		0.45	1.21		0.57	0.28			0.86
Uniform Delay, d1		32.4	21.6		40.8	35.7		19.3	18.3			30.7
Progression Factor		1.00	1.00		1.05	0.88		1.00	1.00			1.00
Incremental Delay, d2		16.2	1.1		1.9	100.5		2.5	1.0			22.0
Delay (s)		48.6	22.8		44.6	132.0		21.8	19.3			52.7
Level of Service		D	C		D	F		C	B			D
Approach Delay (s)			29.1			128.7			20.4			38.6
Approach LOS			C			F			C			D

Intersection Summary			
HCM 2000 Control Delay	64.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	111.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: 52nd Street & Shattuck Ave

Children's Hospital
2035 AM Plus Phase 1

Movement	SBR
Lane Configurations	
Volume (vph)	410
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.92
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1385
Flt Permitted	1.00
Satd. Flow (perm)	1385
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	410
RTOR Reduction (vph)	292
Lane Group Flow (vph)	118
Confl. Peds. (#/hr)	24
Confl. Bikes (#/hr)	62
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	25.4
Effective Green, g (s)	25.4
Actuated g/C Ratio	0.28
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	390
v/s Ratio Prot	
v/s Ratio Perm	0.09
v/c Ratio	0.30
Uniform Delay, d1	25.3
Progression Factor	1.00
Incremental Delay, d2	2.0
Delay (s)	27.3
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Fehr & Peers

Synchro 8 Report

HCM Signalized Intersection Capacity Analysis
15: Telegraph Ave & 52nd Street/Claremont Ave

Children's Hospital
2035 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	10	120	70	230	10	1002	140	130	900	484
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.98			0.99		1.00	0.96	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.95		1.00	0.89			0.98		1.00	0.95	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1641		1698	1560			3862		1770	3208	
Flt Permitted		0.98		0.95	1.00			0.94		0.95	1.00	
Satd. Flow (perm)		1641		1698	1560			3626		1770	3208	
Peak-hour factor, PHF	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. Flow (vph)	10	10	10	120	70	230	10	1002	140	130	900	484
RTOR Reduction (vph)	0	10	0	0	129	0	0	9	0	0	57	0
Lane Group Flow (vph)	0	21	0	108	183	0	0	1143	0	130	1327	0
Confl. Peds. (#/hr)	6					6	33		27			33
Confl. Bikes (#/hr)			2			3			50			41
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		4.5		17.1	17.1			40.6		9.8	54.9	
Effective Green, g (s)		4.5		17.1	17.1			40.6		9.8	54.9	
Actuated g/C Ratio		0.05		0.19	0.19			0.45		0.11	0.61	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		82		322	296			1635		192	1956	
v/s Ratio Prot		c0.01		0.06	c0.12					0.07	c0.41	
v/s Ratio Perm								0.32				
v/c Ratio		0.25		0.34	0.62			0.70		0.68	0.68	
Uniform Delay, d1		41.1		31.5	33.5			19.8		38.6	11.7	
Progression Factor		1.50		1.00	1.00			0.93		1.00	1.00	
Incremental Delay, d2		0.8		0.6	3.8			1.7		9.1	1.9	
Delay (s)		62.5		32.2	37.3			20.2		47.7	13.6	
Level of Service		E		C	D			C		D	B	
Approach Delay (s)		62.5			36.0			20.2			16.5	
Approach LOS		E			D			C			B	

Intersection Summary				
HCM 2000 Control Delay	20.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	101.3%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
16: Telegraph Ave & 51St Street

Children's Hospital
2035 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	322	660	100	130	590	320	131	510	80	220	740	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.97		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3399		1787	3292		1719	3324		1752	3420	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3399		1787	3292		1719	3324		1752	3420	
Peak-hour factor, PHF	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. Flow (vph)	322	660	100	130	590	320	131	510	80	220	740	70
RTOR Reduction (vph)	0	13	0	0	80	0	0	13	0	0	8	0
Lane Group Flow (vph)	322	747	0	130	830	0	131	577	0	220	802	0
Confl. Peds. (#/hr)			47			47			45			56
Confl. Bikes (#/hr)			14			11			41			41
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	12.8	27.2		10.6	25.5		10.7	23.7		12.0	26.0	
Effective Green, g (s)	12.8	27.2		10.6	25.5		10.7	23.7		12.0	26.0	
Actuated g/C Ratio	0.14	0.30		0.12	0.28		0.12	0.26		0.13	0.29	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	483	1027		210	932		204	875		233	988	
v/s Ratio Prot	c0.09	0.22		0.07	c0.25		0.08	0.17		c0.13	c0.23	
v/s Ratio Perm												
v/c Ratio	0.67	0.73		0.62	0.89		0.64	0.66		0.94	0.81	
Uniform Delay, d1	36.6	28.1		37.8	30.9		37.8	29.5		38.7	29.7	
Progression Factor	1.22	1.02		1.00	1.00		1.00	1.00		1.24	0.83	
Incremental Delay, d2	2.9	3.8		5.3	12.5		6.7	3.9		37.5	5.8	
Delay (s)	47.4	32.4		43.1	43.4		44.6	33.4		85.5	30.6	
Level of Service	D	C		D	D		D	C		F	C	
Approach Delay (s)		36.9			43.4			35.5			42.3	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	39.8	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	81.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	261	0	0	0	0	1615	0	0	0	0	1722	261
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	261	0	0	0	0	1615	0	0	0	0	1722	261
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	261	0	0	0	0	1615	0	0	0	0	1722	261
Confl. Peds. (#/hr)				9								
Confl. Bikes (#/hr)									3			
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	8.0					45.0					29.0	45.0
Effective Green, g (s)	8.0					45.0					29.0	45.0
Actuated g/C Ratio	0.18					1.00					0.64	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	581					1627					2303	2814
v/s Ratio Prot	0.08										0.48	0.09
v/s Ratio Perm						c0.99						
v/c Ratio	0.45					0.99					0.75	0.09
Uniform Delay, d1	16.5					0.0					5.5	0.0
Progression Factor	1.00					1.00					2.06	1.00
Incremental Delay, d2	2.5					20.6					1.7	0.0
Delay (s)	19.0					20.6					13.0	0.0
Level of Service	B					C					B	A
Approach Delay (s)		19.0			20.6			0.0			11.3	
Approach LOS		B			C			A			B	

Intersection Summary				
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	1.21			
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	61.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	190	20	80	130	0	40	0	80	10	60	10
Peak Hour 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
Hourly flow rate (vph)	0	190	20	80	130	0	40	0	80	10	60	10

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	210	210	40	80	80
Volume Left (vph)	0	80	40	0	10
Volume Right (vph)	20	0	0	80	10
Hadj (s)	-0.04	0.11	0.50	-0.70	-0.02
Departure Headway (s)	4.6	4.8	6.1	4.9	5.2
Degree Utilization, x	0.27	0.28	0.07	0.11	0.12
Capacity (veh/h)	730	712	545	669	628
Control Delay (s)	9.4	9.6	8.4	7.3	8.9
Approach Delay (s)	9.4	9.6	7.7		8.9
Approach LOS	A	A	A		A

Intersection Summary				
Delay	9.1			
Level of Service	A			
Intersection Capacity Utilization	44.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	20	170	10	10	140	30	10	10	10	30	10	10
Peak Hour 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
Hourly flow rate (vph)	20	170	10	10	140	30	10	10	10	30	10	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	200	180	30	50
Volume Left (vph)	20	10	10	30
Volume Right (vph)	10	30	10	10
Hadj (s)	0.01	-0.09	-0.13	0.00
Departure Headway (s)	4.3	4.2	4.7	4.8
Degree Utilization, x	0.24	0.21	0.04	0.07
Capacity (veh/h)	816	820	704	688
Control Delay (s)	8.6	8.3	7.9	8.1
Approach Delay (s)	8.6	8.3	7.9	8.1
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.4	
Level of Service			A	
Intersection Capacity Utilization		28.6%	ICU Level of Service	A
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (veh/h)	10	400	10	10	440	20	10	20	20	40	20	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	400	10	10	440	20	10	20	20	40	20	10
Pedestrians		12			3			15			17	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	477			425			942	937	423	945	932	479
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	477			425			942	937	423	945	932	479
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			95	92	97	81	92	98
cM capacity (veh/h)	1075			1131			214	255	626	209	255	573

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	420	470	50	70
Volume Left	10	10	10	40
Volume Right	10	20	20	10
cSH	1075	1131	318	244
Volume to Capacity	0.01	0.01	0.16	0.29
Queue Length 95th (ft)	1	1	14	29
Control Delay (s)	0.3	0.3	18.4	25.6
Lane LOS	A	A	C	D
Approach Delay (s)	0.3	0.3	18.4	25.6
Approach LOS			C	D

Intersection Summary				
Average Delay			2.9	
Intersection Capacity Utilization		46.5%	ICU Level of Service	A
Analysis Period (min)			15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	34	1762	201	0	1923
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	34	1762	201	0	1923
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			154			137
pX, platoon unblocked	0.83	0.73			0.73	
vC, conflicting volume	2504	688			1963	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	410	0			1024	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	476	791			492	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	34	705	705	553	641	641	641
Volume Left	0	0	0	0	0	0	0
Volume Right	34	0	0	201	0	0	0
cSH	791	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.04	0.41	0.41	0.33	0.38	0.38	0.38
Queue Length 95th (ft)	3	0	0	0	0	0	0
Control Delay (s)	9.8	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	9.8	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		48.5%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	1	1851	25	0	2033
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	1	1851	25	0	2033
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			424			204
pX, platoon unblocked	0.74					
vC, conflicting volume	2541	630			1876	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1842	630			1876	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	49	425			316	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	1	740	740	395	678	678	678
Volume Left	0	0	0	0	0	0	0
Volume Right	1	0	0	25	0	0	0
cSH	425	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.44	0.44	0.23	0.40	0.40	0.40
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	13.5	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	13.5	0.0			0.0		
Approach LOS	B						

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		46.3%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	20	270	180	60	240	110	29	211	1772	158	200	1471
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			0.99			1.00	0.99		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.95			0.96			1.00	0.99		1.00	1.00
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1747			1728			1770	4979		1770	5054
Flt Permitted		0.97			0.75			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1707			1310			1770	4979		1770	5054
Peak-hour factor, PHF	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. Flow (vph)	20	270	180	60	240	110	29	211	1772	158	200	1471
RTOR Reduction (vph)	0	23	0	0	14	0	0	0	10	0	0	3
Lane Group Flow (vph)	0	447	0	0	396	0	0	240	1920	0	200	1508
Confl. Peds. (#/hr)	17		23	23		17				30		
Confl. Bikes (#/hr)			24			18				23		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		31.7			31.7			21.5	42.3		11.5	32.3
Effective Green, g (s)		31.7			31.7			21.5	42.3		11.5	32.3
Actuated g/C Ratio		0.32			0.32			0.22	0.42		0.12	0.32
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		541			415			380	2106		203	1632
v/s Ratio Prot								0.14	c0.39		0.11	c0.30
v/s Ratio Perm		0.26			c0.30							
v/c Ratio		0.83			0.96			0.63	0.91		0.99	0.92
Uniform Delay, d1		31.6			33.5			35.7	27.1		44.2	32.7
Progression Factor		1.00			1.00			0.53	0.38		1.00	1.00
Incremental Delay, d2		10.0			32.5			2.7	6.0		58.5	10.3
Delay (s)		41.6			66.0			21.4	16.3		102.6	43.0
Level of Service		D			E			C	B		F	D
Approach Delay (s)		41.6			66.0				16.9			50.0
Approach LOS		D			E				B			D

Intersection Summary			
HCM 2000 Control Delay	35.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	106.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	40
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	40
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	18
Confl. Bikes (#/hr)	23
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	578	20	10	330	20	20	20	30	20	20	40
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	578	20	10	330	20	20	20	30	20	20	40
Pedestrians		6			20			11			26	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked	0.96						0.96	0.96		0.96	0.96	0.96
vC, conflicting volume	376			609			1075	1055	619	1094	1055	372
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	328			609			1057	1036	619	1077	1036	324
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			99			88	90	94	87	90	94
cM capacity (veh/h)	1140			951			160	209	480	149	207	667

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	628	360	70	80
Volume Left	30	10	20	20
Volume Right	20	20	30	40
cSH	1140	951	247	275
Volume to Capacity	0.03	0.01	0.28	0.29
Queue Length 95th (ft)	2	1	28	29
Control Delay (s)	0.7	0.4	25.2	23.4
Lane LOS	A	A	D	C
Approach Delay (s)	0.7	0.4	25.2	23.4
Approach LOS			D	C

Intersection Summary				
Average Delay	3.7			
Intersection Capacity Utilization	61.8%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
2035 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	438	70	30	210	50	80	630	50	30	580	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.99			0.99			1.00			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.99			0.99	
Flt Protected		0.99			0.99			0.99			1.00	
Satd. Flow (prot)		1749			1773			1827			1843	
Flt Permitted		0.86			0.91			0.88			0.95	
Satd. Flow (perm)		1515			1621			1613			1757	
Peak-hour factor, PHF	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. Flow (vph)	110	438	70	30	210	50	80	630	50	30	580	60
RTOR Reduction (vph)	0	6	0	0	10	0	0	3	0	0	5	0
Lane Group Flow (vph)	0	612	0	0	280	0	0	757	0	0	665	0
Confl. Peds. (#/hr)	17		17	17		17	29		11	11		29
Confl. Bikes (#/hr)			23			15			47			33
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		29.0			29.0			43.0			43.0	
Effective Green, g (s)		29.0			29.0			43.0			43.0	
Actuated g/C Ratio		0.36			0.36			0.54			0.54	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		549			587			866			944	
v/s Ratio Prot												
v/s Ratio Perm		c0.40			0.17			c0.47			0.38	
v/c Ratio		1.12			0.48			0.87			0.70	
Uniform Delay, d1		25.5			19.7			16.1			13.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		74.1			2.8			11.9			4.4	
Delay (s)		99.6			22.4			28.0			18.2	
Level of Service		F			C			C			B	
Approach Delay (s)		99.6			22.4			28.0			18.2	
Approach LOS		F			C			C			B	

Intersection Summary				
HCM 2000 Control Delay	43.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.97			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	128.3%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
2035 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	307	30	171	50	20	20	130	1197	70	20	1131	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.98			0.99		1.00	0.99		1.00	0.98	
Flpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Frt		0.95			0.97		1.00	0.99		1.00	0.99	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1624			1695		1770	3488		1787	3470	
Flt Permitted		0.78			0.72		0.12	1.00		0.12	1.00	
Satd. Flow (perm)		1303			1249		229	3488		223	3470	
Peak-hour factor, PHF	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. Flow (vph)	307	30	171	50	20	20	130	1197	70	20	1131	120
RTOR Reduction (vph)	0	21	0	0	12	0	0	4	0	0	9	0
Lane Group Flow (vph)	0	487	0	0	78	0	130	1263	0	20	1242	0
Confl. Peds. (#/hr)	17		39	39		17	38		26	26		38
Confl. Bikes (#/hr)			12			14			44			68
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		34.8			34.8		46.2	46.2		46.2	46.2	
Effective Green, g (s)		34.8			34.8		46.2	46.2		46.2	46.2	
Actuated g/C Ratio		0.39			0.39		0.51	0.51		0.51	0.51	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		503			482		117	1790		114	1781	
v/s Ratio Prot								0.36			0.36	
v/s Ratio Perm		c0.37			0.06		c0.57			0.09		
v/c Ratio		0.97			0.16		1.11	0.71		0.18	0.70	
Uniform Delay, d1		27.1			18.1		21.9	16.7		11.7	16.6	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		31.8			0.2		116.2	2.4		3.3	2.3	
Delay (s)		58.8			18.2		138.1	19.1		15.0	18.9	
Level of Service		E			B		F	B		B	B	
Approach Delay (s)		58.8			18.2			30.1			18.8	
Approach LOS		E			B			C			B	

Intersection Summary				
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	1.05			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	90.7%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (veh/h)	10	10	50	20	10	10	13	40	2119	20	10	20
Sign Control		Stop			Stop				Free			
Grade		0%			0%				0%			
Peak Hour 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
Hourly flow rate (vph)	10	10	50	20	10	10	0	40	2119	20	0	20
Pedestrians		8			29				17			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		1			2				1			
Right turn flare (veh)												
Median type									None			
Median storage veh)												
Upstream signal (ft)									299			
pX, platoon unblocked	0.86	0.86	0.71	0.86	0.86	0.71	0.00	0.71			0.00	0.71
vC, conflicting volume	2529	3976	592	2907	3976	745	0	1698			0	2168
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0	1642	0	394	1642	0	0	581			0	1235
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			0.0	4.1
tC, 2 stage (s)												
tF (s)	*8.0	*8.0	*8.0	*8.0	*8.0	*8.0	0.0	2.2			0.0	2.2
p0 queue free %	97	85	84	88	85	97	0	94			0	95
cM capacity (veh/h)	294	65	315	164	65	314	0	703			0	394

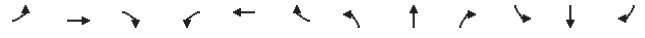
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	70	40	570	1060	550	438	835	438
Volume Left	10	20	40	0	0	20	0	0
Volume Right	50	10	0	0	20	0	0	20
cSH	201	129	703	1700	1700	394	1700	1700
Volume to Capacity	0.35	0.31	0.06	0.62	0.32	0.05	0.49	0.26
Queue Length 95th (ft)	37	30	5	0	0	4	0	0
Control Delay (s)	32.1	44.8	1.5	0.0	0.0	1.6	0.0	0.0
Lane LOS	D	E	A			A		
Approach Delay (s)	32.1	44.8	0.4			0.4		
Approach LOS	D	E						

Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	94.7%	ICU Level of Service		F
Analysis Period (min)	15			

* User Entered Value

Movement	SBT	SBR
Lane Configurations		
Volume (veh/h)	1670	20
Sign Control	Free	
Grade	0%	
Peak Hour Factor	1.00	1.00
Hourly flow rate (vph)	1670	20
Pedestrians		
Lane Width (ft)		
Walking Speed (ft/s)		
Percent Blockage		
Right turn flare (veh)		
Median type	None	
Median storage veh)		
Upstream signal (ft)	294	
pX, platoon unblocked		
vC, conflicting volume		
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol		
tC, single (s)		
tC, 2 stage (s)		
tF (s)		
p0 queue free %		
cM capacity (veh/h)		

Direction, Lane #



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	20	10	10	10	20	10	50	10	10	30	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	20	10	10	10	20	10	50	10	10	30	10
Pedestrians		18			12			9			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	178	165	62	171	165	72	58			72		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	178	165	62	171	165	72	58			72		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	97	99	99	99	98	99			99		
cM capacity (veh/h)	728	704	986	737	704	982	1536			1526		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	40	40	70	50
Volume Left	10	10	10	10
Volume Right	10	20	10	10
cSH	765	831	1536	1526
Volume to Capacity	0.05	0.05	0.01	0.01
Queue Length 95th (ft)	4	4	0	0
Control Delay (s)	10.0	9.6	1.1	1.5
Lane LOS	A	A	A	A
Approach Delay (s)	10.0	9.6	1.1	1.5
Approach LOS	A	A		

Intersection Summary				
Average Delay	4.7			
Intersection Capacity Utilization	21.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	20	20	770	700	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	20	20	770	700	10
Pedestrians	38				2	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	3				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.81	0.74	0.74			
vC, conflicting volume	1555	743	748			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1168	476	482			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	95	97			
cM capacity (veh/h)	165	425	773			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	30	790	710
Volume Left	10	20	0
Volume Right	20	0	10
cSH	278	773	1700
Volume to Capacity	0.11	0.03	0.42
Queue Length 95th (ft)	9	2	0
Control Delay (s)	19.5	0.7	0.0
Lane LOS	C	A	
Approach Delay (s)	19.5	0.7	0.0
Approach LOS	C		

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	66.6%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	10	10	60	40	10	10	10	10	2172	59	30	1733
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.90			0.98			1.00	1.00		1.00	1.00
Flt Protected		0.99			0.97			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1632			1785			1770	5043		1787	5128
Flt Permitted		0.97			0.82			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1585			1510			1770	5043		1787	5128
Peak-hour factor, PHF	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. Flow (vph)	10	10	60	40	10	10	10	10	2172	59	30	1733
RTOR Reduction (vph)	0	50	0	0	8	0	0	0	2	0	0	0
Lane Group Flow (vph)	0	30	0	0	52	0	0	20	2229	0	30	1743
Confl. Peds. (#/hr)	12		6	6		12				48		
Confl. Bikes (#/hr)			6			3				20		
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		16.4			16.4			3.1	64.7		6.4	68.0
Effective Green, g (s)		16.4			16.4			3.1	64.7		6.4	68.0
Actuated g/C Ratio		0.16			0.16			0.03	0.65		0.06	0.68
Clearance Time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		259			247			54	3262		114	3487
v/s Ratio Prot								0.01	c0.44		0.02	c0.34
v/s Ratio Perm		0.02			c0.03							
v/c Ratio		0.12			0.21			0.37	0.68		0.26	0.50
Uniform Delay, d1		35.6			36.2			47.5	11.2		44.6	7.8
Progression Factor		1.00			1.05			1.41	0.18		0.76	0.50
Incremental Delay, d2		0.2			0.4			2.6	0.7		0.6	0.3
Delay (s)		35.8			38.5			69.6	2.7		34.4	4.2
Level of Service		D			D			E	A		C	A
Approach Delay (s)		35.8			38.5				3.3			4.7
Approach LOS		D			D				A			A

Intersection Summary			
HCM 2000 Control Delay	5.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: MLK Way & 53rd Street

Children's Hospital
2035 PM Plus Phase 1

Movement	SBR
Lane Configurations	
Volume (vph)	10
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	10
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	21
Confl. Bikes (#/hr)	24
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis — Children's Hospital
9: Dover Street & 53rd Street — 2035 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	10	59	10	10	10	10	50	10	10	30	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	20	10	59	10	10	10	10	50	10	10	30	10
Pedestrians		38			15			6			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	189	188	79	215	188	76	78			75		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	189	188	79	215	188	76	78			75		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	99	94	98	99	99	99			99		
cM capacity (veh/h)	700	670	951	650	670	974	1485			1518		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	89	30	70	50
Volume Left	20	10	10	10
Volume Right	59	10	10	10
cSH	843	739	1485	1518
Volume to Capacity	0.11	0.04	0.01	0.01
Queue Length 95th (ft)	9	3	1	0
Control Delay (s)	9.8	10.1	1.1	1.5
Lane LOS	A	B	A	A
Approach Delay (s)	9.8	10.1	1.1	1.5
Approach LOS	A	B		

Intersection Summary				
Average Delay	5.5			
Intersection Capacity Utilization	25.4%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis — Children's Hospital
10: MLK Way & 52nd Street — 2035 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	81	139	110	136	99	226	60	120	1853	89	3	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.95			1.00	0.96		1.00	1.00			1.00
Flpb, ped/bikes	0.98	1.00			0.97	1.00		1.00	1.00			1.00
Frt	1.00	0.93			1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00			0.97	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1760	1672			1752	1521		1787	5089			1787
Flt Permitted	0.48	1.00			0.52	1.00		0.95	1.00			0.95
Satd. Flow (perm)	884	1672			930	1521		1787	5089			1787
Peak-hour factor, PHF	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. Flow (vph)	81	139	110	136	99	226	60	120	1853	89	3	158
RTOR Reduction (vph)	0	30	0	0	0	165	0	0	5	0	0	0
Lane Group Flow (vph)	81	219	0	0	235	61	0	180	1937	0	0	161
Confl. Peds. (#/hr)	24		92	92		24				15		
Confl. Bikes (#/hr)			14			6				23		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	27.0	27.0			27.0	27.0		13.6	42.0			17.5
Effective Green, g (s)	27.0	27.0			27.0	27.0		13.6	42.0			17.5
Actuated g/C Ratio	0.27	0.27			0.27	0.27		0.14	0.42			0.18
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	238	451			251	410		243	2137			312
v/s Ratio Prot		0.13						0.10	c0.38			0.09
v/s Ratio Perm	0.09				c0.25	0.04						
v/c Ratio	0.34	0.49			0.94	0.15		0.74	0.91			0.52
Uniform Delay, d1	29.3	30.7			35.7	27.8		41.5	27.2			37.4
Progression Factor	1.00	1.00			0.93	2.03		0.97	1.06			0.51
Incremental Delay, d2	0.3	0.3			38.0	0.1		3.0	2.1			0.5
Delay (s)	29.7	31.0			71.0	56.4		43.1	31.0			19.6
Level of Service	C	C			E	E		D	C			B
Approach Delay (s)		30.6			63.9				32.0			
Approach LOS		C			E				C			

Intersection Summary					
HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C		
HCM 2000 Volume to Capacity ratio	0.90				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0		
Intersection Capacity Utilization	109.1%	ICU Level of Service	H		
Analysis Period (min)	15				

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1672	0
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5136	
Flt Permitted	1.00	
Satd. Flow (perm)	5136	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1672	0
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1672	0
Confl. Peds. (#/hr)		20
Confl. Bikes (#/hr)		26
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	45.4	
Effective Green, g (s)	45.4	
Actuated g/C Ratio	0.45	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2331	
v/s Ratio Prot	c0.33	
v/s Ratio Perm		
v/c Ratio	0.72	
Uniform Delay, d1	22.1	
Progression Factor	0.26	
Incremental Delay, d2	1.8	
Delay (s)	7.6	
Level of Service	A	
Approach Delay (s)	8.6	
Approach LOS	A	

Intersection Summary				
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.20			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	44.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	370	5	11	365	2	25	3	13	0	4	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.93			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.96			0.87	
Flt Protected		1.00			1.00			0.97			1.00	
Satd. Flow (prot)		3522			3590			1419			1640	
Flt Permitted		0.95			0.94			0.89			1.00	
Satd. Flow (perm)		3364			3391			1304			1640	
Peak-hour factor, PHF	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. Flow (vph)	3	370	5	11	365	2	25	3	13	0	4	59
RTOR Reduction (vph)	0	2	0	0	1	0	0	7	0	0	32	0
Lane Group Flow (vph)	0	376	0	0	377	0	0	34	0	0	31	0
Confl. Peds. (#/hr)			89	89		38			312	312		
Confl. Bikes (#/hr)			15			9						2
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Prot	NA		Perm	NA		Perm	NA			NA	
Protected Phases	5	2			6			4			8	
Permitted Phases				6			4			8		
Actuated Green, G (s)		21.0			14.0			23.0			23.0	
Effective Green, g (s)		21.0			14.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.28			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1425			949			599			754	
v/s Ratio Prot		c0.02									0.02	
v/s Ratio Perm		0.09			c0.11			c0.03				
v/c Ratio		0.26			0.40			0.06			0.04	
Uniform Delay, d1		9.5			14.6			7.5			7.4	
Progression Factor		1.61			1.00			1.00			1.00	
Incremental Delay, d2		0.4			1.2			0.2			0.1	
Delay (s)		15.6			15.8			7.7			7.5	
Level of Service		B			B			A			A	
Approach Delay (s)		15.6			15.8			7.7			7.5	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.20			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	44.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
12: 52nd Street & Dover Street

Children's Hospital
2035 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	357	7	5	362	40	5	2	8	71	1	28
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	357	7	5	362	40	5	2	8	71	1	28
Pedestrians		56			11			53			23	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		5			1			4			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.87			0.88			0.93	0.93	0.88	0.93	0.93	0.87
vC, conflicting volume	425			417			950	908	424	856	892	461
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	269			275			629	585	284	528	567	310
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	97			100			98	99	99	81	100	95
cM capacity (veh/h)	1104			1093			288	349	617	384	368	600

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	394	407	15	100
Volume Left	30	5	5	71
Volume Right	7	40	8	28
cSH	1104	1093	416	427
Volume to Capacity	0.03	0.00	0.04	0.23
Queue Length 95th (ft)	2	0	3	22
Control Delay (s)	0.9	0.2	14.0	16.0
Lane LOS	A	A	B	C
Approach Delay (s)	0.9	0.2	14.0	16.0
Approach LOS			B	C

Intersection Summary					
Average Delay	2.4				
Intersection Capacity Utilization	57.7%	ICU Level of Service		B	
Analysis Period (min)	15				

HCM Unsignalized Intersection Capacity Analysis
13: SR-24 NB Off-Ramp & 52nd Street

Children's Hospital
2035 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	438	0	0	412	1150	0	1140	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	438	0	0	412	1150	0	1140	0	0
Pedestrians							50			
Lane Width (ft)							12.0			
Walking Speed (ft/s)							4.0			
Percent Blockage							4			
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.79						0.79		0.79	0.79
vC, conflicting volume	1562			488			2050	269	1771	900
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1175			488			1794	269	1440	335
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	465			1027			60	696	0	441

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	219	219	275	521	767	570	570
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	383	767	570	570
cSH	1700	1700	1700	1700	1700	696	696
Volume to Capacity	0.13	0.13	0.16	0.31	0.45	0.82	0.82
Queue Length 95th (ft)	0	0	0	0	0	219	219
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	29.2	29.2
Lane LOS						D	D
Approach Delay (s)	0.0		0.0			29.2	
Approach LOS						D	

Intersection Summary					
Average Delay	10.6				
Intersection Capacity Utilization	59.6%	ICU Level of Service		B	
Analysis Period (min)	15				

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	50	350	978	200	90	962	180	170	290	100	170	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.98		1.00	0.99		1.00	0.98			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			0.99
Frt		1.00	0.97		1.00	0.98		1.00	0.96			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.98
Satd. Flow (prot)		1787	4919		1805	4991		1752	1737			1714
Flt Permitted		0.95	1.00		0.95	1.00		0.24	1.00			0.52
Satd. Flow (perm)		1787	4919		1805	4991		436	1737			921
Peak-hour factor, PHF	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. Flow (vph)	50	350	978	200	90	962	180	170	290	100	170	170
RTOR Reduction (vph)	0	0	28	0	0	24	0	0	11	0	0	0
Lane Group Flow (vph)	0	400	1150	0	90	1118	0	170	379	0	0	340
Confl. Peds. (#/hr)				21	21		17			33	33	
Confl. Bikes (#/hr)				20			12			45		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		33.5	53.0		6.5	26.0		36.5	36.5			27.0
Effective Green, g (s)		33.5	53.0		6.5	26.0		36.5	36.5			27.0
Actuated g/C Ratio		0.30	0.48		0.06	0.24		0.33	0.33			0.25
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		544	2370		106	1179		210	576			226
v/s Ratio Prot		c0.22	0.23		0.05	c0.22		c0.04	0.22			
v/s Ratio Perm								0.23				c0.37
v/c Ratio		0.74	0.49		0.85	0.95		0.81	0.66			1.50
Uniform Delay, d1		34.3	19.3		51.3	41.3		33.5	31.4			41.5
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Incremental Delay, d2		8.6	0.7		43.4	16.4		20.1	5.8			248.7
Delay (s)		42.9	20.0		94.6	57.7		53.5	37.2			290.2
Level of Service		D	B		F	E		D	D			F
Approach Delay (s)			25.8			60.4			42.1			155.8
Approach LOS			C			E			D			F

Intersection Summary			
HCM 2000 Control Delay	61.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	109.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	380
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.92
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1389
Flt Permitted	1.00
Satd. Flow (perm)	1389
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	380
RTOR Reduction (vph)	287
Lane Group Flow (vph)	93
Confl. Peds. (#/hr)	27
Confl. Bikes (#/hr)	41
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	27.0
Effective Green, g (s)	27.0
Actuated g/C Ratio	0.25
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	340
v/s Ratio Prot	
v/s Ratio Perm	0.07
v/c Ratio	0.27
Uniform Delay, d1	33.6
Progression Factor	1.00
Incremental Delay, d2	2.0
Delay (s)	35.6
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
15: Telegraph Ave & 52nd Street/Claremont Ave

Children's Hospital
2035 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	20	20	210	90	200	30	1177	340	200	831	321
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.94			0.98		1.00	0.91	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.95		1.00	0.90			0.97		1.00	0.96	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1642		1698	1508			3757		1770	3073	
Flt Permitted		0.98		0.95	1.00			0.90		0.95	1.00	
Satd. Flow (perm)		1642		1698	1508			3402		1770	3073	
Peak-hour factor, PHF	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. Flow (vph)	20	20	20	210	90	200	30	1177	340	200	831	321
RTOR Reduction (vph)	0	19	0	0	68	0	0	23	0	0	36	0
Lane Group Flow (vph)	0	41	0	189	243	0	0	1524	0	200	1116	0
Confl. Peds. (#/hr)	51					51	105		33			105
Confl. Bikes (#/hr)			2			15			53			72
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		6.2		19.6	19.6			43.0		13.2	60.7	
Effective Green, g (s)		6.2		19.6	19.6			43.0		13.2	60.7	
Actuated g/C Ratio		0.06		0.20	0.20			0.43		0.13	0.61	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		101		332	295			1462		233	1865	
v/s Ratio Prot		c0.03		0.11	c0.16					c0.11	0.36	
v/s Ratio Perm								c0.45				
v/c Ratio		0.41		0.57	0.83			1.04		0.86	0.60	
Uniform Delay, d1		45.1		36.4	38.6			28.5		42.5	12.1	
Progression Factor		1.81		1.00	1.00			0.50		1.00	1.00	
Incremental Delay, d2		0.8		2.2	16.9			26.5		25.4	1.4	
Delay (s)		82.5		38.6	55.5			40.7		67.9	13.6	
Level of Service		F		D	E			D		E	B	
Approach Delay (s)		82.5			49.1			40.7			21.6	
Approach LOS		F			D			D			C	

Intersection Summary				
HCM 2000 Control Delay	35.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	113.3%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
16: Telegraph Ave & 51St Street

Children's Hospital
2035 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	327	750	111	80	580	240	121	980	190	310	681	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.97		1.00	0.97		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.96		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3380		1787	3307		1719	3270		1752	3362	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3380		1787	3307		1719	3270		1752	3362	
Peak-hour factor, PHF	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. Flow (vph)	327	750	111	80	580	240	121	980	190	310	681	70
RTOR Reduction (vph)	0	11	0	0	44	0	0	15	0	0	8	0
Lane Group Flow (vph)	327	850	0	80	776	0	121	1155	0	310	743	0
Confl. Peds. (#/hr)			78			57			86			138
Confl. Bikes (#/hr)			12			23			51			81
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.4	29.0		8.3	23.4		8.5	33.2		13.0	38.7	
Effective Green, g (s)	14.4	29.0		8.3	23.4		8.5	33.2		13.0	38.7	
Actuated g/C Ratio	0.14	0.29		0.08	0.23		0.08	0.33		0.13	0.39	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	489	980		148	773		146	1085		227	1301	
v/s Ratio Prot	c0.10	c0.25		0.04	c0.23		0.07	c0.35		c0.18	0.22	
v/s Ratio Perm												
v/c Ratio	0.67	0.87		0.54	1.00		0.83	1.06		1.37	0.57	
Uniform Delay, d1	40.5	33.7		44.0	38.3		45.0	33.4		43.5	24.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.14	0.71	
Incremental Delay, d2	3.5	10.2		4.0	33.2		30.5	46.1		186.0	1.5	
Delay (s)	44.0	43.9		48.0	71.5		75.5	79.5		235.5	18.7	
Level of Service	D	D		D	E		E	E		F	B	
Approach Delay (s)		43.9			69.4			79.1			82.1	
Approach LOS		D			E			E			F	

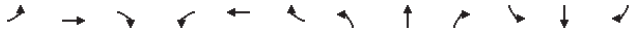
Intersection Summary				
HCM 2000 Control Delay	68.4	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	99.3%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	340	0	0	0	0	1782	0	0	0	0	1758	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	340	0	0	0	0	1782	0	0	0	0	1758	250
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	340	0	0	0	0	1782	0	0	0	0	1758	250
Confl. Peds. (#/hr)				3								
Confl. Bikes (#/hr)									14			
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	13.0					50.0					29.0	50.0
Effective Green, g (s)	13.0					50.0					29.0	50.0
Actuated g/C Ratio	0.26					1.00					0.58	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	850					1627					2072	2814
v/s Ratio Prot	0.10										0.49	0.09
v/s Ratio Perm						c1.10						
v/c Ratio	0.40					1.10					0.85	0.09
Uniform Delay, d1	15.3					25.0					8.7	0.0
Progression Factor	1.00					1.00					2.69	1.00
Incremental Delay, d2	1.4					53.1					3.3	0.0
Delay (s)	16.7					78.1					26.7	0.0
Level of Service	B					E					C	A
Approach Delay (s)		16.7			78.1			0.0			23.4	
Approach LOS		B			E			A			C	

Intersection Summary				
HCM 2000 Control Delay	46.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.30			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	65.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	160	10	100	139	0	60	0	150	10	70	10
Peak Hour 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
Hourly flow rate (vph)	0	160	10	100	139	0	60	0	150	10	70	10

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	170	239	60	150	90
Volume Left (vph)	0	100	60	0	10
Volume Right (vph)	10	0	0	150	10
Hadj (s)	-0.02	0.12	0.50	-0.70	-0.01
Departure Headway (s)	5.0	5.0	6.2	5.0	5.4
Degree Utilization, x	0.24	0.33	0.10	0.21	0.13
Capacity (veh/h)	668	675	547	671	606
Control Delay (s)	9.5	10.5	8.7	8.0	9.2
Approach Delay (s)	9.5	10.5	8.2		9.2
Approach LOS	A	B	A		A

Intersection Summary				
Delay	9.4			
Level of Service	A			
Intersection Capacity Utilization	46.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	150	10	20	129	50	10	10	10	20	10	10
Peak Hour 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
Hourly flow rate (vph)	10	150	10	20	129	50	10	10	10	20	10	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	170	199	30	40
Volume Left (vph)	10	20	10	20
Volume Right (vph)	10	50	10	10
Hadj (s)	-0.01	-0.13	-0.13	-0.05
Departure Headway (s)	4.3	4.1	4.6	4.7
Degree Utilization, x	0.20	0.23	0.04	0.05
Capacity (veh/h)	822	854	714	701
Control Delay (s)	8.3	8.3	7.8	7.9
Approach Delay (s)	8.3	8.3	7.8	7.9
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.3	
Level of Service			A	
Intersection Capacity Utilization			28.5%	ICU Level of Service
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (veh/h)	20	390	10	20	451	40	10	20	40	40	10	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	20	390	10	20	451	40	10	20	40	40	10	20
Pedestrians		8						11			5	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		1						1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	496			411			990	982	406	1001	967	484
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	496			411			990	982	406	1001	967	484
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			95	92	94	79	96	97
cM capacity (veh/h)	1069			1148			201	239	643	187	242	577

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	420	511	70	70
Volume Left	20	20	10	40
Volume Right	10	40	40	20
cSH	1069	1148	358	241
Volume to Capacity	0.02	0.02	0.20	0.29
Queue Length 95th (ft)	1	1	18	29
Control Delay (s)	0.6	0.5	17.5	25.9
Lane LOS	A	A	C	D
Approach Delay (s)	0.6	0.5	17.5	25.9
Approach LOS			C	D

Intersection Summary				
Average Delay			3.3	
Intersection Capacity Utilization			51.2%	ICU Level of Service
Analysis Period (min)			15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	123	2129	34	0	1843
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	123	2129	34	0	1843
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			154			137
pX, platoon unblocked	0.72	0.64			0.64	
vC, conflicting volume	2760	727			2163	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	556	0			860	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	82			100	
cM capacity (veh/h)	334	696			499	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	123	852	852	460	614	614	614
Volume Left	0	0	0	0	0	0	0
Volume Right	123	0	0	34	0	0	0
cSH	696	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.18	0.50	0.50	0.27	0.36	0.36	0.36
Queue Length 95th (ft)	16	0	0	0	0	0	0
Control Delay (s)	11.3	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	11.3	0.0			0.0		
Approach LOS	B						

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	56.2%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	2102	20	0	1978
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	2102	20	0	1978
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			424			204
pX, platoon unblocked	0.74					
vC, conflicting volume	2771	711			2122	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2148	711			2122	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	30	376			253	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	0	841	841	440	659	659	659
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	20	0	0	0
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.49	0.49	0.26	0.39	0.39	0.39
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	0.0	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	44.4%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection Sign configuration not allowed in HCM analysis.

Appendix K

LOS Calculation Worksheets – 2035 Plus Phase 2 Conditions

FEHR PEERS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	20	200	250	60	270	100	21	180	1446	70	160	1531
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			0.99			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.93			0.97			1.00	0.99		1.00	0.99
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1702			1741			1770	5029		1770	5037
Flt Permitted		0.98			0.79			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1663			1383			1770	5029		1770	5037
Peak-hour factor, PHF	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. Flow (vph)	20	200	250	60	270	100	21	180	1446	70	160	1531
RTOR Reduction (vph)	0	50	0	0	13	0	0	0	5	0	0	5
Lane Group Flow (vph)	0	420	0	0	417	0	0	201	1511	0	160	1596
Confl. Peds. (#/hr)	11		21	21		11				32		
Confl. Bikes (#/hr)			24			23				9		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		29.4			29.4			13.5	38.6		7.5	32.6
Effective Green, g (s)		29.4			29.4			13.5	38.6		7.5	32.6
Actuated g/C Ratio		0.33			0.33			0.15	0.43		0.08	0.36
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		543			451			265	2156		147	1824
v/s Ratio Prot								0.11	c0.30		0.09	c0.32
v/s Ratio Perm		0.25			c0.30							
v/c Ratio		0.77			0.92			0.76	0.70		1.09	0.87
Uniform Delay, d1		27.3			29.2			36.7	21.0		41.2	26.8
Progression Factor		1.00			1.00			0.53	0.27		1.00	1.00
Incremental Delay, d2		6.8			24.5			10.5	1.7		99.9	6.2
Delay (s)		34.1			53.8			30.0	7.5		141.1	33.0
Level of Service		C			D			C	A		F	C
Approach Delay (s)		34.1			53.8				10.1			42.8
Approach LOS		C			D				B			D

Intersection Summary			
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	99.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: MLK Way & 55th Street

Children's Hospital
2035 AM Plus Phase 2

Movement	SBR
Lane Configurations	
Volume (vph)	70
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	70
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	18
Confl. Bikes (#/hr)	11
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Fehr & Peers

Synchro 8 Report

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	380	10	33	370	10	10	10	22	10	10	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	380	10	33	370	10	10	10	22	10	10	30
Pedestrians		14			30			23			9	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			3			2			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked	0.87						0.87	0.87		0.87	0.87	0.87
vC, conflicting volume	389			413			958	923	438	952	923	398
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	225			413			878	838	438	871	838	235
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			97			95	96	96	95	96	96
cM capacity (veh/h)	1147			1113			199	244	596	200	242	685

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	420	413	42	50
Volume Left	30	33	10	10
Volume Right	10	10	22	30
cSH	1147	1113	328	370
Volume to Capacity	0.03	0.03	0.13	0.14
Queue Length 95th (ft)	2	2	11	12
Control Delay (s)	0.8	1.0	17.6	16.3
Lane LOS	A	A	C	C
Approach Delay (s)	0.8	1.0	17.6	16.3
Approach LOS			C	C

Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	46.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	272	80	42	293	70	50	520	31	30	620	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.98			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.97			0.98			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		1717			1774			1836			1852	
Flt Permitted		0.78			0.91			0.91			0.96	
Satd. Flow (perm)		1344			1621			1674			1787	
Peak-hour factor, PHF	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. Flow (vph)	80	272	80	42	293	70	50	520	31	30	620	50
RTOR Reduction (vph)	0	10	0	0	10	0	0	2	0	0	3	0
Lane Group Flow (vph)	0	422	0	0	395	0	0	599	0	0	697	0
Confl. Peds. (#/hr)	9		20	20		9	11		26	26		11
Confl. Bikes (#/hr)			33			15			20			36
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		25.0			25.0			47.0			47.0	
Effective Green, g (s)		25.0			25.0			47.0			47.0	
Actuated g/C Ratio		0.31			0.31			0.59			0.59	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		420			506			983			1049	
v/s Ratio Prot												
v/s Ratio Perm		c0.31			0.24			0.36			c0.39	
v/c Ratio		1.00			0.78			0.61			0.66	
Uniform Delay, d1		27.5			25.0			10.6			11.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		44.9			11.4			2.8			3.3	
Delay (s)		72.4			36.4			13.4			14.5	
Level of Service		E			D			B			B	
Approach Delay (s)		72.4			36.4			13.4			14.5	
Approach LOS		E			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	95.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	193	20	100	50	10	10	80	1130	60	40	1360	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	0.99		1.00	0.98	
Flpb, ped/bikes		1.00			0.99		1.00	1.00		0.99	1.00	
Frt		0.96			0.98		1.00	0.99		1.00	0.97	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1648			1711		1770	3493		1775	3423	
Flt Permitted		0.77			0.72		0.10	1.00		0.17	1.00	
Satd. Flow (perm)		1310			1280		182	3493		324	3423	
Peak-hour factor, PHF	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. Flow (vph)	193	20	100	50	10	10	80	1130	60	40	1360	305
RTOR Reduction (vph)	0	19	0	0	7	0	0	5	0	0	23	0
Lane Group Flow (vph)	0	294	0	0	63	0	80	1185	0	40	1642	0
Confl. Peds. (#/hr)	9		17	17		9	20		26	26		20
Confl. Bikes (#/hr)			23			23			65			41
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.0			20.0		41.0	41.0		41.0	41.0	
Effective Green, g (s)		20.0			20.0		41.0	41.0		41.0	41.0	
Actuated g/C Ratio		0.29			0.29		0.59	0.59		0.59	0.59	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		374			365		106	2045		189	2004	
v/s Ratio Prot								0.34			c0.48	
v/s Ratio Perm		c0.22			0.05		0.44			0.12		
v/c Ratio		0.79			0.17		0.75	0.58		0.21	0.82	
Uniform Delay, d1		23.0			18.8		10.8	9.1		6.9	11.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		10.5			0.2		38.7	1.2		2.5	3.9	
Delay (s)		33.5			19.0		49.5	10.3		9.4	15.4	
Level of Service		C			B		D	B		A	B	
Approach Delay (s)		33.5			19.0			12.8			15.3	
Approach LOS		C			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	83.3%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	10	10	60	10	10	10	10	30	1687	20	10	1802
Sign Control		Stop			Stop				Free			Free
Grade		0%			0%				0%			0%
Peak Hour 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
Hourly flow rate (vph)	10	10	60	10	10	10	0	30	1687	20	10	1802
Pedestrians		11			9				12			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		1			1				1			
Right turn flare (veh)												
Median type									None			None
Median storage veh)												
Upstream signal (ft)									299			294
pX, platoon unblocked	0.80	0.80	0.71	0.80	0.80	0.81	0.00	0.71			0.81	
vC, conflicting volume	2475	3614	629	2464	3609	581	0	1823			1716	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	389	1806	0	374	1800	0	0	723			1066	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	*5.0	*5.0	*5.0	0.0	2.2			2.2	
p0 queue free %	97	83	92	96	82	98	0	95			98	
cM capacity (veh/h)	348	59	758	251	56	579	0	615			527	

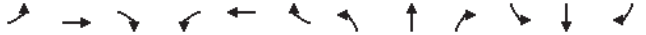
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	80	30	452	844	442	460	901	460
Volume Left	10	10	30	0	0	10	0	0
Volume Right	60	10	0	0	20	0	0	10
cSH	288	127	615	1700	1700	527	1700	1700
Volume to Capacity	0.28	0.24	0.05	0.50	0.26	0.02	0.53	0.27
Queue Length 95th (ft)	28	22	4	0	0	1	0	0
Control Delay (s)	22.2	41.7	1.4	0.0	0.0	0.6	0.0	0.0
Lane LOS	C	E	A			A		
Approach Delay (s)	22.2	41.7	0.4			0.1		
Approach LOS	C	E						

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	76.8%	ICU Level of Service	D	
Analysis Period (min)	15			

* User Entered Value

Movement	SBR
Lane Configurations	
Volume (veh/h)	10
Sign Control	
Grade	
Peak Hour Factor	1.00
Hourly flow rate (vph)	10
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	
tC, single (s)	
tC, 2 stage (s)	
tF (s)	
p0 queue free %	
cM capacity (veh/h)	

Direction, Lane #	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	10	10	10	10	10	10	22	20	10	43	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	10	10	10	10	10	10	22	20	10	43	10
Pedestrians		15			21			3			9	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	159	166	66	159	161	62	68			63		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	159	166	66	159	161	62	68			63		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	99	99	99	99	99			99		
cM capacity (veh/h)	753	699	988	753	704	983	1527			1525		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	30	30	52	63
Volume Left	10	10	10	10
Volume Right	10	10	20	10
cSH	796	797	1527	1525
Volume to Capacity	0.04	0.04	0.01	0.01
Queue Length 95th (ft)	3	3	0	0
Control Delay (s)	9.7	9.7	1.5	1.2
Lane LOS	A	A	A	A
Approach Delay (s)	9.7	9.7	1.5	1.2
Approach LOS	A	A		

Intersection Summary					
Average Delay		4.2			
Intersection Capacity Utilization		21.8%	ICU Level of Service		A
Analysis Period (min)		15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	20	20	591	712	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	20	20	591	712	10
Pedestrians	14			3	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.76	0.75	0.75			
vC, conflicting volume	1364	734	736			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1285	480	483			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	95	98			
cM capacity (veh/h)	134	437	802			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	30	611	722
Volume Left	10	20	0
Volume Right	20	0	10
cSH	249	802	1700
Volume to Capacity	0.12	0.02	0.42
Queue Length 95th (ft)	10	2	0
Control Delay (s)	21.5	0.7	0.0
Lane LOS	C	A	
Approach Delay (s)	21.5	0.7	0.0
Approach LOS	C		

Intersection Summary			
Average Delay		0.8	
Intersection Capacity Utilization		58.2%	ICU Level of Service B
Analysis Period (min)		15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	50	20	10	20	30	1717	47	20	1862	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.98			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.90			0.95		1.00	1.00		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1639			1740		1770	5055		1787	5129	
Flt Permitted		0.96			0.88		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1589			1562		1770	5055		1787	5129	
Peak-hour factor, PHF	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. Flow (vph)	10	10	50	20	10	20	30	1717	47	20	1862	10
RTOR Reduction (vph)	0	41	0	0	16	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	29	0	0	34	0	30	1762	0	20	1872	0
Confl. Peds. (#/hr)	11		20	20		11			20			30
Confl. Bikes (#/hr)									8			20
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		15.8			15.8		4.5	58.1		3.6	57.2	
Effective Green, g (s)		15.8			15.8		4.5	58.1		3.6	57.2	
Actuated g/C Ratio		0.18			0.18		0.05	0.65		0.04	0.64	
Clearance Time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		278			274		88	3263		71	3259	
v/s Ratio Prot							0.02	c0.35		0.01	c0.36	
v/s Ratio Perm		0.02			c0.02							
v/c Ratio		0.10			0.12		0.34	0.54		0.28	0.57	
Uniform Delay, d1		31.2			31.3		41.3	8.7		41.9	9.4	
Progression Factor		1.00			1.02		1.19	0.50		0.50	0.26	
Incremental Delay, d2		0.2			0.2		1.6	0.5		1.2	0.4	
Delay (s)		31.3			31.9		50.7	4.8		22.1	2.9	
Level of Service		C			C		D	A		C	A	
Approach Delay (s)		31.3			31.9			5.6			3.1	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
9: Dover Street & 53rd Street

Children's Hospital
2035 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	10	37	10	10	10	20	32	20	10	33	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	20	10	37	10	10	10	20	32	20	10	33	20
Pedestrians		33			32			3			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			3			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	196	220	79	222	220	77	86			84		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	196	220	79	222	220	77	86			84		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	98	96	98	98	99	99			99		
cM capacity (veh/h)	688	632	957	643	632	961	1481			1485		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	67	30	72	63
Volume Left	20	10	20	10
Volume Right	37	10	20	20
cSH	802	718	1481	1485
Volume to Capacity	0.08	0.04	0.01	0.01
Queue Length 95th (ft)	7	3	1	1
Control Delay (s)	9.9	10.2	2.1	1.2
Lane LOS	A	B	A	A
Approach Delay (s)	9.9	10.2	2.1	1.2
Approach LOS	A	B		

Intersection Summary				
Average Delay		5.2		
Intersection Capacity Utilization		23.9%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
10: MLK Way & 52nd Street

Children's Hospital
2035 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	58	95	120	109	112	303	60	110	1584	157	33	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.95			1.00	0.97		1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00			0.98	1.00		1.00	1.00			1.00
Frt	1.00	0.92			1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00			0.98	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1771	1645			1778	1534		1787	5045			1787
Flt Permitted	0.51	1.00			0.62	1.00		0.95	1.00			0.95
Satd. Flow (perm)	955	1645			1124	1534		1787	5045			1787
Peak-hour factor, PHF	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. Flow (vph)	58	95	120	109	112	303	60	110	1584	157	33	128
RTOR Reduction (vph)	0	56	0	0	0	175	0	0	12	0	0	0
Lane Group Flow (vph)	58	159	0	0	221	128	0	170	1729	0	0	161
Confl. Peds. (#/hr)	15		74	74		15				11		
Confl. Bikes (#/hr)			9			8				2		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	24.2	24.2			24.2	24.2		7.5	39.8			12.5
Effective Green, g (s)	24.2	24.2			24.2	24.2		7.5	39.8			12.5
Actuated g/C Ratio	0.27	0.27			0.27	0.27		0.08	0.44			0.14
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	256	442			302	412		148	2231			248
v/s Ratio Prot		0.10						c0.10	c0.34			0.09
v/s Ratio Perm	0.06				c0.20	0.08						
v/c Ratio	0.23	0.36			0.73	0.31		1.15	0.78			0.65
Uniform Delay, d1	25.6	26.6			29.9	26.2		41.2	21.3			36.7
Progression Factor	1.00	1.00			1.00	1.00		0.99	1.09			0.85
Incremental Delay, d2	0.2	0.2			7.6	0.2		91.5	1.0			3.7
Delay (s)	25.8	26.8			37.6	26.4		132.4	24.2			35.1
Level of Service	C	C			D	C		F	C			D
Approach Delay (s)		26.6			31.1				33.8			
Approach LOS		C			C				C			

Intersection Summary				
HCM 2000 Control Delay		26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio		0.79		
Actuated Cycle Length (s)		90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization		105.9%	ICU Level of Service	G
Analysis Period (min)		15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1761	0
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5136	
Flt Permitted	1.00	
Satd. Flow (perm)	5136	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1761	0
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1761	0
Confl. Peds. (#/hr)		15
Confl. Bikes (#/hr)		15
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	44.3	
Effective Green, g (s)	44.3	
Actuated g/C Ratio	0.49	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2528	
v/s Ratio Prot	c0.34	
v/s Ratio Perm		
v/c Ratio	0.70	
Uniform Delay, d1	17.7	
Progression Factor	0.87	
Incremental Delay, d2	1.4	
Delay (s)	16.7	
Level of Service	B	
Approach Delay (s)	18.2	
Approach LOS	B	

Intersection Summary			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	352	4	3	490	2	7	3	5	0	2	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.93			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.95			0.88	
Flt Protected		1.00			1.00			0.98			1.00	
Satd. Flow (prot)		1855			1897			1424			1655	
Flt Permitted		1.00			1.00			0.95			1.00	
Satd. Flow (perm)		1849			1895			1386			1655	
Peak-hour factor, PHF	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. Flow (vph)	4	352	4	3	490	2	7	3	5	0	2	15
RTOR Reduction (vph)	0	1	0	0	1	0	0	3	0	0	8	0
Lane Group Flow (vph)	0	359	0	0	494	0	0	12	0	0	9	0
Confl. Peds. (#/hr)	26		83	83		26			303	303		
Confl. Bikes (#/hr)			9			8						2
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		21.0			21.0			23.0			23.0	
Effective Green, g (s)		21.0			21.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.42			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		776			795			637			761	
v/s Ratio Prot											0.01	
v/s Ratio Perm		0.19			c0.26			c0.01				
v/c Ratio		0.46			0.62			0.02			0.01	
Uniform Delay, d1		10.4			11.4			7.4			7.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.0			3.6			0.1			0.0	
Delay (s)		12.4			15.0			7.4			7.4	
Level of Service		B			B			A			A	
Approach Delay (s)		12.4			15.0			7.4			7.4	
Approach LOS		B			B			A			A	

Intersection Summary					
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.31				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		6.0	
Intersection Capacity Utilization	53.5%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	262	73	42	432	50	36	2	26	45	6	32
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	262	73	42	432	50	36	2	26	45	6	32
Pedestrians		30			15			18			35	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			1			1			3	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.82			0.86			0.89	0.89	0.86	0.89	0.89	0.82
vC, conflicting volume	517			353			982	978	332	976	989	522
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	297			172			569	564	147	562	577	303
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	97			97			88	99	96	86	98	94
cM capacity (veh/h)	998			1200			307	336	738	330	341	573

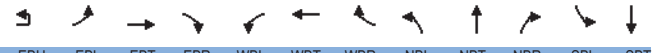
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	365	524	64	83
Volume Left	30	42	36	45
Volume Right	73	50	26	32
cSH	998	1200	404	396
Volume to Capacity	0.03	0.03	0.16	0.21
Queue Length 95th (ft)	2	3	14	20
Control Delay (s)	1.0	1.0	15.6	16.5
Lane LOS	A	A	C	C
Approach Delay (s)	1.0	1.0	15.6	16.5
Approach LOS			C	C

Intersection Summary					
Average Delay	3.2				
Intersection Capacity Utilization	54.4%	ICU Level of Service		A	
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	336	0	0	533	1270	0	1100	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	336	0	0	533	1270	0	1100	0	0
Pedestrians							36			
Lane Width (ft)							12.0			
Walking Speed (ft/s)							4.0			
Percent Blockage							3			
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.79						0.79		0.79	0.79
vC, conflicting volume	1803			372			2175	204	1801	905
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1493			372			1961	204	1490	362
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	354			1148			48	776	0	435

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	168	168	355	601	847	550	550
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	423	847	550	550
cSH	1700	1700	1700	1700	1700	776	776
Volume to Capacity	0.10	0.10	0.21	0.35	0.50	0.71	0.71
Queue Length 95th (ft)	0	0	0	0	0	151	151
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	20.1	20.1
Lane LOS						C	C
Approach Delay (s)	0.0		0.0			20.1	
Approach LOS						C	

Intersection Summary					
Average Delay	6.8				
Intersection Capacity Utilization	57.3%	ICU Level of Service		B	
Analysis Period (min)	15				



Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	50	301	925	160	50	1161	150	180	150	60	140	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.99		1.00	0.99		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.98		1.00	0.98		1.00	0.96			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.98
Satd. Flow (prot)		1787	4960		1805	5072		1752	1748			1731
Flt Permitted		0.95	1.00		0.95	1.00		0.31	1.00			0.77
Satd. Flow (perm)		1787	4960		1805	5072		578	1748			1356
Peak-hour factor, PHF	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. Flow (vph)	50	301	925	160	50	1161	150	180	150	60	140	190
RTOR Reduction (vph)	0	0	23	0	0	18	0	0	16	0	0	0
Lane Group Flow (vph)	0	351	1062	0	50	1293	0	180	194	0	0	330
Confl. Peds. (#/hr)				18			8			15	15	
Confl. Bikes (#/hr)				18			2			15		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		21.2	34.6		5.5	18.9		35.9	35.9			25.4
Effective Green, g (s)		21.2	34.6		5.5	18.9		35.9	35.9			25.4
Actuated g/C Ratio		0.24	0.38		0.06	0.21		0.40	0.40			0.28
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		420	1906		110	1065		315	697			382
v/s Ratio Prot		c0.20	0.21		0.03	c0.25		c0.04	0.11			
v/s Ratio Perm								0.19				c0.24
v/c Ratio		0.84	0.56		0.45	1.21		0.57	0.28			0.86
Uniform Delay, d1		32.7	21.7		40.8	35.5		19.3	18.3			30.7
Progression Factor		1.00	1.00		1.04	0.89		1.00	1.00			1.00
Incremental Delay, d2		17.6	1.2		2.0	102.2		2.5	1.0			22.0
Delay (s)		50.4	22.9		44.4	133.8		21.8	19.3			52.7
Level of Service		D	C		D	F		C	B			D
Approach Delay (s)			29.6			130.5			20.4			38.8
Approach LOS			C			F			C			D

Intersection Summary			
HCM 2000 Control Delay	65.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	111.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	412
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.92
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1385
Flt Permitted	1.00
Satd. Flow (perm)	1385
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	412
RTOR Reduction (vph)	287
Lane Group Flow (vph)	125
Confl. Peds. (#/hr)	24
Confl. Bikes (#/hr)	62
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	25.4
Effective Green, g (s)	25.4
Actuated g/C Ratio	0.28
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	390
v/s Ratio Prot	
v/s Ratio Perm	0.09
v/c Ratio	0.32
Uniform Delay, d1	25.5
Progression Factor	1.00
Incremental Delay, d2	2.2
Delay (s)	27.6
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
15: Telegraph Ave & 52nd Street/Claremont Ave

Children's Hospital
2035 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	10	120	70	230	10	1010	140	130	900	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.98			0.99		1.00	0.96	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.95		1.00	0.89			0.98		1.00	0.95	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1641		1698	1560			3863		1770	3202	
Flt Permitted		0.98		0.95	1.00			0.94		0.95	1.00	
Satd. Flow (perm)		1641		1698	1560			3625		1770	3202	
Peak-hour factor, PHF	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. Flow (vph)	10	10	10	120	70	230	10	1010	140	130	900	500
RTOR Reduction (vph)	0	10	0	0	129	0	0	9	0	0	61	0
Lane Group Flow (vph)	0	21	0	108	183	0	0	1151	0	130	1339	0
Confl. Peds. (#/hr)	6					6	33		27			33
Confl. Bikes (#/hr)			2			3			50			41
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		4.5		17.1	17.1			40.6		9.8	54.9	
Effective Green, g (s)		4.5		17.1	17.1			40.6		9.8	54.9	
Actuated g/C Ratio		0.05		0.19	0.19			0.45		0.11	0.61	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		82		322	296			1635		192	1953	
v/s Ratio Prot		c0.01		0.06	c0.12					0.07	c0.42	
v/s Ratio Perm								0.32				
v/c Ratio		0.25		0.34	0.62			0.70		0.68	0.69	
Uniform Delay, d1		41.1		31.5	33.5			19.9		38.6	11.8	
Progression Factor		1.49		1.00	1.00			0.94		1.00	1.00	
Incremental Delay, d2		0.8		0.6	3.8			1.8		9.1	2.0	
Delay (s)		62.0		32.2	37.3			20.5		47.7	13.7	
Level of Service		E		C	D			C		D	B	
Approach Delay (s)		62.0			36.0			20.5			16.6	
Approach LOS		E			D			C			B	

Intersection Summary				
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	102.1%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
16: Telegraph Ave & 51St Street

Children's Hospital
2035 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	330	662	103	130	594	320	137	510	80	220	740	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.97		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3397		1787	3293		1719	3324		1752	3420	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3397		1787	3293		1719	3324		1752	3420	
Peak-hour factor, PHF	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. Flow (vph)	330	662	103	130	594	320	137	510	80	220	740	70
RTOR Reduction (vph)	0	14	0	0	80	0	0	13	0	0	8	0
Lane Group Flow (vph)	330	751	0	130	834	0	137	577	0	220	802	0
Confl. Peds. (#/hr)			47			47			45			56
Confl. Bikes (#/hr)			14			11			41			41
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	12.9	27.3		10.6	25.5		10.8	23.6		12.0	25.8	
Effective Green, g (s)	12.9	27.3		10.6	25.5		10.8	23.6		12.0	25.8	
Actuated g/C Ratio	0.14	0.30		0.12	0.28		0.12	0.26		0.13	0.29	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	487	1030		210	933		206	871		233	980	
v/s Ratio Prot	c0.10	0.22		0.07	c0.25		0.08	0.17		c0.13	c0.23	
v/s Ratio Perm												
v/c Ratio	0.68	0.73		0.62	0.89		0.67	0.66		0.94	0.82	
Uniform Delay, d1	36.6	28.0		37.8	31.0		37.9	29.6		38.7	29.9	
Progression Factor	1.22	1.02		1.00	1.00		1.00	1.00		1.24	0.84	
Incremental Delay, d2	3.1	3.7		5.3	12.9		7.8	3.9		37.3	6.0	
Delay (s)	47.8	32.5		43.1	43.8		45.7	33.6		85.2	31.1	
Level of Service	D	C		D	D		D	C		F	C	
Approach Delay (s)		37.1			43.7			35.9			42.7	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	40.1	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	81.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
17: SB SR-24 On-Ramp & MLK Way & NB SR-24 Off-Ramp

Children's Hospital
2035 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	263	0	0	0	0	1644	0	0	0	0	1738	262
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	263	0	0	0	0	1644	0	0	0	0	1738	262
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	263	0	0	0	0	1644	0	0	0	0	1738	262
Confl. Peds. (#/hr)				9								
Confl. Bikes (#/hr)									3			
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	8.0					45.0					29.0	45.0
Effective Green, g (s)	8.0					45.0					29.0	45.0
Actuated g/C Ratio	0.18					1.00					0.64	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	581					1627					2303	2814
v/s Ratio Prot	0.08										0.49	0.09
v/s Ratio Perm						c1.01						
v/c Ratio	0.45					1.01					0.75	0.09
Uniform Delay, d1	16.5					22.5					5.5	0.0
Progression Factor	1.00					1.00					2.06	1.00
Incremental Delay, d2	2.5					24.9					1.7	0.0
Delay (s)	19.1					47.4					13.1	0.0
Level of Service	B					D					B	A
Approach Delay (s)		19.1			47.4			0.0			11.4	
Approach LOS		B			D			A			B	

Intersection Summary				
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	1.23			
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	62.2%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
18: West Street & 52nd Street

Children's Hospital
2035 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	193	20	80	132	0	40	0	80	10	60	10
Peak Hour 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
Hourly flow rate (vph)	0	193	20	80	132	0	40	0	80	10	60	10

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	213	212	40	80	80
Volume Left (vph)	0	80	40	0	10
Volume Right (vph)	20	0	0	80	10
Hadj (s)	-0.04	0.11	0.50	-0.70	-0.02
Departure Headway (s)	4.7	4.8	6.1	4.9	5.2
Degree Utilization, x	0.28	0.28	0.07	0.11	0.12
Capacity (veh/h)	729	712	544	667	626
Control Delay (s)	9.4	9.7	8.4	7.3	8.9
Approach Delay (s)	9.4	9.7	7.7		8.9
Approach LOS	A	A	A		A

Intersection Summary					
Delay		9.1			
Level of Service		A			
Intersection Capacity Utilization	44.9%	ICU Level of Service		A	
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	20	173	10	10	142	30	10	10	10	30	10	10
Peak Hour 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
Hourly flow rate (vph)	20	173	10	10	142	30	10	10	10	30	10	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	203	182	30	50
Volume Left (vph)	20	10	10	30
Volume Right (vph)	10	30	10	10
Hadj (s)	0.01	-0.09	-0.13	0.00
Departure Headway (s)	4.3	4.2	4.7	4.8
Degree Utilization, x	0.24	0.21	0.04	0.07
Capacity (veh/h)	816	819	702	686
Control Delay (s)	8.7	8.4	7.9	8.1
Approach Delay (s)	8.7	8.4	7.9	8.1
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.4	
Level of Service			A	
Intersection Capacity Utilization			28.8%	ICU Level of Service
Analysis Period (min)			15	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (veh/h)	10	400	10	10	440	20	10	20	20	40	20	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	400	10	10	440	20	10	20	20	40	20	10
Pedestrians		12			3			15			17	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	477			425			942	937	423	945	932	479
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	477			425			942	937	423	945	932	479
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			95	92	97	81	92	98
cM capacity (veh/h)	1075			1131			214	255	626	209	255	573

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	420	470	50	70
Volume Left	10	10	10	40
Volume Right	10	20	20	10
cSH	1075	1131	318	244
Volume to Capacity	0.01	0.01	0.16	0.29
Queue Length 95th (ft)	1	1	14	29
Control Delay (s)	0.3	0.3	18.4	25.6
Lane LOS	A	A	C	D
Approach Delay (s)	0.3	0.3	18.4	25.6
Approach LOS			C	D

Intersection Summary				
Average Delay			2.9	
Intersection Capacity Utilization			46.5%	ICU Level of Service
Analysis Period (min)			15	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	34	1767	201	0	1932
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	34	1767	201	0	1932
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			154			137
pX, platoon unblocked	0.82	0.71			0.71	
vC, conflicting volume	2512	690			1968	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	315	0			938	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	534	771			516	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	34	707	707	554	644	644	644
Volume Left	0	0	0	0	0	0	0
Volume Right	34	0	0	201	0	0	0
cSH	771	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.04	0.42	0.42	0.33	0.38	0.38	0.38
Queue Length 95th (ft)	3	0	0	0	0	0	0
Control Delay (s)	9.9	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	9.9	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		48.6%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	1907	0	0	2050
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	1907	0	0	2050
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			424			204
pX, platoon unblocked	0.73					
vC, conflicting volume	2590	636			1907	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1894	636			1907	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	45	421			308	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	0	763	763	381	683	683	683
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.45	0.45	0.22	0.40	0.40	0.40
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	0.0	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		42.9%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	20	270	180	60	240	110	29	211	1783	158	200	1474
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			0.99			1.00	0.99		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.95			0.96			1.00	0.99		1.00	1.00
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1747			1728			1770	4980		1770	5054
Flt Permitted		0.97			0.75			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1707			1310			1770	4980		1770	5054
Peak-hour factor, PHF	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. Flow (vph)	20	270	180	60	240	110	29	211	1783	158	200	1474
RTOR Reduction (vph)	0	23	0	0	14	0	0	0	10	0	0	3
Lane Group Flow (vph)	0	447	0	0	396	0	0	240	1931	0	200	1511
Confl. Peds. (#/hr)	17		23	23		17				30		
Confl. Bikes (#/hr)			24			18				23		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		31.7			31.7			21.5	42.3		11.5	32.3
Effective Green, g (s)		31.7			31.7			21.5	42.3		11.5	32.3
Actuated g/C Ratio		0.32			0.32			0.22	0.42		0.12	0.32
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		541			415			380	2106		203	1632
v/s Ratio Prot								0.14	c0.39		0.11	c0.30
v/s Ratio Perm		0.26			c0.30							
v/c Ratio		0.83			0.96			0.63	0.92		0.99	0.93
Uniform Delay, d1		31.6			33.5			35.7	27.2		44.2	32.7
Progression Factor		1.00			1.00			0.52	0.40		1.00	1.00
Incremental Delay, d2		10.0			32.5			2.7	6.3		58.5	10.5
Delay (s)		41.6			66.0			21.1	17.3		102.6	43.2
Level of Service		D			E			C	B		F	D
Approach Delay (s)		41.6			66.0				17.7			50.1
Approach LOS		D			E				B			D

Intersection Summary			
HCM 2000 Control Delay	35.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	106.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: MLK Way & 55th Street

Children's Hospital
2035 PM Plus Phase 2

Movement	SBR
Lane Configurations	
Volume (vph)	40
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	40
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	18
Confl. Bikes (#/hr)	23
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis
2: Dover Street & 55th Street

Children's Hospital
2035 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	578	20	11	330	20	20	20	33	20	20	40
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	578	20	11	330	20	20	20	33	20	20	40
Pedestrians		6			20			11			26	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked	0.96						0.96	0.96		0.96	0.96	0.96
vC, conflicting volume	376			609			1077	1057	619	1099	1057	372
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	327			609			1059	1038	619	1082	1038	323
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			99			87	90	93	86	90	94
cM capacity (veh/h)	1140			951			159	208	480	147	206	668

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	628	361	73	80
Volume Left	30	11	20	20
Volume Right	20	20	33	40
cSH	1140	951	251	273
Volume to Capacity	0.03	0.01	0.29	0.29
Queue Length 95th (ft)	2	1	29	30
Control Delay (s)	0.7	0.4	25.1	23.6
Lane LOS	A	A	D	C
Approach Delay (s)	0.7	0.4	25.1	23.6
Approach LOS			D	C

Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	61.4%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
2035 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	441	70	31	211	50	80	630	53	30	580	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.99			0.99			1.00			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.99			0.99	
Flt Protected		0.99			0.99			0.99			1.00	
Satd. Flow (prot)		1749			1773			1826			1843	
Flt Permitted		0.86			0.90			0.88			0.95	
Satd. Flow (perm)		1515			1612			1612			1756	
Peak-hour factor, PHF	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. Flow (vph)	110	441	70	31	211	50	80	630	53	30	580	60
RTOR Reduction (vph)	0	6	0	0	10	0	0	3	0	0	5	0
Lane Group Flow (vph)	0	615	0	0	282	0	0	760	0	0	665	0
Confl. Peds. (#/hr)	17		17	17		17	29		11	11		29
Confl. Bikes (#/hr)			23			15			47			33
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		29.0			29.0			43.0			43.0	
Effective Green, g (s)		29.0			29.0			43.0			43.0	
Actuated g/C Ratio		0.36			0.36			0.54			0.54	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		549			584			866			943	
v/s Ratio Prot												
v/s Ratio Perm		c0.41			0.18			c0.47			0.38	
v/c Ratio		1.12			0.48			0.88			0.71	
Uniform Delay, d1		25.5			19.7			16.2			13.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		76.1			2.9			12.2			4.4	
Delay (s)		101.6			22.6			28.4			18.2	
Level of Service		F			C			C			B	
Approach Delay (s)		101.6			22.6			28.4			18.2	
Approach LOS		F			C			C			B	

Intersection Summary				
HCM 2000 Control Delay	44.1	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.97			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	128.2%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
2035 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	313	30	171	50	20	20	130	1216	70	20	1136	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.98			0.99		1.00	0.99		1.00	0.98	
Flpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Frt		0.96			0.97		1.00	0.99		1.00	0.99	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1625			1695		1770	3489		1787	3468	
Flt Permitted		0.78			0.72		0.12	1.00		0.11	1.00	
Satd. Flow (perm)		1302			1247		222	3489		210	3468	
Peak-hour factor, PHF	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. Flow (vph)	313	30	171	50	20	20	130	1216	70	20	1136	122
RTOR Reduction (vph)	0	20	0	0	12	0	0	4	0	0	9	0
Lane Group Flow (vph)	0	494	0	0	78	0	130	1282	0	20	1249	0
Confl. Peds. (#/hr)	17		39	39		17	38		26	26		38
Confl. Bikes (#/hr)			12			14			44			68
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		35.1			35.1		45.9	45.9		45.9	45.9	
Effective Green, g (s)		35.1			35.1		45.9	45.9		45.9	45.9	
Actuated g/C Ratio		0.39			0.39		0.51	0.51		0.51	0.51	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		507			486		113	1779		107	1768	
v/s Ratio Prot								0.37			0.36	
v/s Ratio Perm		c0.38			0.06		c0.58			0.10		
v/c Ratio		0.97			0.16		1.15	0.72		0.19	0.71	
Uniform Delay, d1		27.0			17.9		22.1	17.1		11.9	16.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		33.1			0.2		130.8	2.6		3.8	2.4	
Delay (s)		60.1			18.0		152.8	19.6		15.8	19.3	
Level of Service		E			B		F	B		B	B	
Approach Delay (s)		60.1			18.0			31.9			19.2	
Approach LOS		E			B			C			B	

Intersection Summary				
HCM 2000 Control Delay	31.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	1.07			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	91.2%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (veh/h)	10	10	50	20	10	10	13	40	2130	20	10	20
Sign Control		Stop			Stop				Free			
Grade		0%			0%				0%			
Peak Hour 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
Hourly flow rate (vph)	10	10	50	20	10	10	0	40	2130	20	0	20
Pedestrians		8			29				17			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		1			2				1			
Right turn flare (veh)												
Median type									None			
Median storage veh)												
Upstream signal (ft)									299			
pX, platoon unblocked	0.85	0.85	0.71	0.85	0.85	0.71	0.00	0.71			0.00	0.71
vC, conflicting volume	2536	3990	593	2919	3990	749	0	1701			0	2179
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0	1644	0	391	1644	0	0	580			0	1238
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			0.0	4.1
tC, 2 stage (s)												
tF (s)	*8.0	*8.0	*8.0	*8.0	*8.0	*8.0	0.0	2.2			0.0	2.2
p0 queue free %	97	84	84	88	84	97	0	94			0	95
cM capacity (veh/h)	293	64	315	164	64	312	0	702			0	392

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	70	40	572	1065	552	438	836	438
Volume Left	10	20	40	0	0	20	0	0
Volume Right	50	10	0	0	20	0	0	20
cSH	201	129	702	1700	1700	392	1700	1700
Volume to Capacity	0.35	0.31	0.06	0.63	0.33	0.05	0.49	0.26
Queue Length 95th (ft)	37	30	5	0	0	4	0	0
Control Delay (s)	32.2	44.9	1.5	0.0	0.0	1.6	0.0	0.0
Lane LOS	D	E	A			A		
Approach Delay (s)	32.2	44.9	0.4			0.4		
Approach LOS	D	E						

Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	94.9%	ICU Level of Service		F
Analysis Period (min)	15			

* User Entered Value

Movement	SBT	SBR
Lane Configurations		
Volume (veh/h)	1673	20
Sign Control	Free	
Grade	0%	
Peak Hour Factor	1.00	1.00
Hourly flow rate (vph)	1673	20
Pedestrians		
Lane Width (ft)		
Walking Speed (ft/s)		
Percent Blockage		
Right turn flare (veh)		
Median type	None	
Median storage veh)		
Upstream signal (ft)	294	
pX, platoon unblocked		
vC, conflicting volume		
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol		
tC, single (s)		
tC, 2 stage (s)		
tF (s)		
p0 queue free %		
cM capacity (veh/h)		

Direction, Lane #

HCM Unsignalized Intersection Capacity Analysis
6: Dover Street & 54th Street

Children's Hospital
2035 PM Plus Phase 2

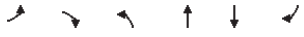
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	20	10	10	10	20	10	53	10	10	31	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	20	10	10	10	20	10	53	10	10	31	10
Pedestrians		18			12			9			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	182	169	63	175	169	75	59			75		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	182	169	63	175	169	75	59			75		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	97	99	99	99	98	99			99		
cM capacity (veh/h)	724	700	985	732	700	978	1534			1522		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	40	40	73	51
Volume Left	10	10	10	10
Volume Right	10	20	10	10
cSH	761	827	1534	1522
Volume to Capacity	0.05	0.05	0.01	0.01
Queue Length 95th (ft)	4	4	0	0
Control Delay (s)	10.0	9.6	1.1	1.5
Lane LOS	A	A	A	A
Approach Delay (s)	10.0	9.6	1.1	1.5
Approach LOS	A	A		

Intersection Summary				
Average Delay	4.6			
Intersection Capacity Utilization	21.1%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
7: Shattuck Ave & 54th Street

Children's Hospital
2035 PM Plus Phase 2



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	20	20	773	701	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	20	20	773	701	10
Pedestrians	38				2	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	3				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.81	0.74	0.74			
vC, conflicting volume	1559	744	749			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1173	477	484			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	95	97			
cM capacity (veh/h)	164	424	772			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	30	793	711
Volume Left	10	20	0
Volume Right	20	0	10
cSH	277	772	1700
Volume to Capacity	0.11	0.03	0.42
Queue Length 95th (ft)	9	2	0
Control Delay (s)	19.6	0.7	0.0
Lane LOS	C	A	
Approach Delay (s)	19.6	0.7	0.0
Approach LOS	C		

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	66.8%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	10	10	60	40	10	10	10	10	2183	59	30	1736
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.90			0.98			1.00	1.00		1.00	1.00
Flt Protected		0.99			0.97			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1632			1785			1770	5043		1787	5129
Flt Permitted		0.97			0.82			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1585			1510			1770	5043		1787	5129
Peak-hour factor, PHF	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. Flow (vph)	10	10	60	40	10	10	10	10	2183	59	30	1736
RTOR Reduction (vph)	0	50	0	0	8	0	0	0	2	0	0	0
Lane Group Flow (vph)	0	30	0	0	52	0	0	20	2240	0	30	1746
Confl. Peds. (#/hr)	12		6	6		12				48		
Confl. Bikes (#/hr)			6			3				20		
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		16.4			16.4			3.1	64.7		6.4	68.0
Effective Green, g (s)		16.4			16.4			3.1	64.7		6.4	68.0
Actuated g/C Ratio		0.16			0.16			0.03	0.65		0.06	0.68
Clearance Time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		259			247			54	3262		114	3487
v/s Ratio Prot								0.01	c0.44		0.02	c0.34
v/s Ratio Perm		0.02			c0.03							
v/c Ratio		0.12			0.21			0.37	0.69		0.26	0.50
Uniform Delay, d1		35.6			36.2			47.5	11.2		44.6	7.8
Progression Factor		1.00			1.04			1.41	0.18		0.75	0.50
Incremental Delay, d2		0.2			0.4			2.1	0.6		0.6	0.3
Delay (s)		35.8			38.1			69.3	2.6		34.2	4.2
Level of Service		D			D			E	A		C	A
Approach Delay (s)		35.8			38.1				3.2			4.7
Approach LOS		D			D				A			A

Intersection Summary			
HCM 2000 Control Delay	4.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: MLK Way & 53rd Street

Children's Hospital
2035 PM Plus Phase 2

Movement	SBR
Lane Configurations	
Volume (vph)	10
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	10
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	21
Confl. Bikes (#/hr)	24
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis — Children's Hospital
9: Dover Street & 53rd Street — 2035 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	10	59	10	10	10	10	53	10	10	31	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	20	10	59	10	10	10	10	53	10	10	31	10
Pedestrians		38			15			6			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	193	192	80	219	192	79	79			78		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	193	192	80	219	192	79	79			78		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	99	94	98	99	99	99			99		
cM capacity (veh/h)	695	667	950	646	667	970	1483			1514		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	89	30	73	51
Volume Left	20	10	10	10
Volume Right	59	10	10	10
cSH	841	736	1483	1514
Volume to Capacity	0.11	0.04	0.01	0.01
Queue Length 95th (ft)	9	3	1	0
Control Delay (s)	9.8	10.1	1.1	1.5
Lane LOS	A	B	A	A
Approach Delay (s)	9.8	10.1	1.1	1.5
Approach LOS	A	B		

Intersection Summary				
Average Delay			5.5	
Intersection Capacity Utilization			25.4%	ICU Level of Service
Analysis Period (min)			15	

HCM Signalized Intersection Capacity Analysis — Children's Hospital
10: MLK Way & 52nd Street — 2035 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	81	140	110	173	103	237	60	120	1853	120	3	161
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.95			1.00	0.96		1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00			0.96	1.00		1.00	1.00			1.00
Frt	1.00	0.93			1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00			0.97	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1762	1673			1742	1522		1787	5064			1787
Flt Permitted	0.44	1.00			0.53	1.00		0.95	1.00			0.95
Satd. Flow (perm)	813	1673			949	1522		1787	5064			1787
Peak-hour factor, PHF	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. Flow (vph)	81	140	110	173	103	237	60	120	1853	120	3	161
RTOR Reduction (vph)	0	29	0	0	0	166	0	0	7	0	0	0
Lane Group Flow (vph)	81	221	0	0	276	71	0	180	1966	0	0	164
Confl. Peds. (#/hr)	24		92	92		24				15		
Confl. Bikes (#/hr)			14			6				23		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	29.9	29.9			29.9	29.9		13.6	39.1			17.5
Effective Green, g (s)	29.9	29.9			29.9	29.9		13.6	39.1			17.5
Actuated g/C Ratio	0.30	0.30			0.30	0.30		0.14	0.39			0.18
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	243	500			283	455		243	1980			312
v/s Ratio Prot		0.13						0.10	c0.39			0.09
v/s Ratio Perm	0.10				c0.29	0.05						
v/c Ratio	0.33	0.44			0.98	0.16		0.74	0.99			0.53
Uniform Delay, d1	27.3	28.3			34.7	25.8		41.5	30.3			37.5
Progression Factor	1.00	1.00			0.74	1.91		0.96	1.06			0.51
Incremental Delay, d2	0.3	0.2			43.4	0.1		2.8	8.9			0.7
Delay (s)	27.6	28.5			69.1	49.3		42.6	41.0			19.8
Level of Service	C	C			E	D		D	D			B
Approach Delay (s)		28.3			59.9				41.2			
Approach LOS		C			E				D			

Intersection Summary				
HCM 2000 Control Delay		30.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio		0.96		
Actuated Cycle Length (s)		100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization		110.3%	ICU Level of Service	H
Analysis Period (min)		15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1672	0
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5136	
Flt Permitted	1.00	
Satd. Flow (perm)	5136	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1672	0
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1672	0
Confl. Peds. (#/hr)		20
Confl. Bikes (#/hr)		26
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	42.5	
Effective Green, g (s)	42.5	
Actuated g/C Ratio	0.42	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2182	
v/s Ratio Prot	c0.33	
v/s Ratio Perm		
v/c Ratio	0.77	
Uniform Delay, d1	24.5	
Progression Factor	0.32	
Incremental Delay, d2	2.4	
Delay (s)	10.2	
Level of Service	B	
Approach Delay (s)	11.0	
Approach LOS	B	

Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	408	2	5	430	2	12	1	7	0	4	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.93			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.95			0.87	
Flt Protected		1.00			1.00			0.97			1.00	
Satd. Flow (prot)		1859			1896			1403			1640	
Flt Permitted		1.00			1.00			0.92			1.00	
Satd. Flow (perm)		1856			1890			1326			1640	
Peak-hour factor, PHF	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. Flow (vph)	3	408	2	5	430	2	12	1	7	0	4	59
RTOR Reduction (vph)	0	1	0	0	1	0	0	4	0	0	32	0
Lane Group Flow (vph)	0	412	0	0	436	0	0	16	0	0	31	0
Confl. Peds. (#/hr)			89	89		38			312	312		
Confl. Bikes (#/hr)			15			9						2
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		21.0			21.0			23.0			23.0	
Effective Green, g (s)		21.0			21.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.42			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		779			793			609			754	
v/s Ratio Prot											c0.02	
v/s Ratio Perm		0.22			c0.23			0.01				
v/c Ratio		0.53			0.55			0.03			0.04	
Uniform Delay, d1		10.8			10.9			7.4			7.4	
Progression Factor		1.48			1.00			1.00			1.00	
Incremental Delay, d2		2.0			2.7			0.1			0.1	
Delay (s)		18.0			13.7			7.5			7.5	
Level of Service		B			B			A			A	
Approach Delay (s)		18.0			13.7			7.5			7.5	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
12: 52nd Street & Dover Street

Children's Hospital
2035 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	351	45	20	356	40	70	5	47	71	2	28
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	351	45	20	356	40	70	5	47	71	2	28
Pedestrians		56			11			53			23	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		5			1			4			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.86			0.83			0.90	0.90	0.83	0.90	0.90	0.86
vC, conflicting volume	419			449			988	946	438	933	948	455
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	247			237			588	542	223	528	544	289
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	97			98			76	99	93	79	99	95
cM capacity (veh/h)	1111			1063			293	352	628	342	362	609

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	426	416	122	101
Volume Left	30	20	70	71
Volume Right	45	40	47	28
cSH	1111	1063	372	390
Volume to Capacity	0.03	0.02	0.33	0.26
Queue Length 95th (ft)	2	1	35	25
Control Delay (s)	0.9	0.6	19.3	17.4
Lane LOS	A	A	C	C
Approach Delay (s)	0.9	0.6	19.3	17.4
Approach LOS			C	C

Intersection Summary				
Average Delay	4.4			
Intersection Capacity Utilization	51.6%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
13: SR-24 NB Off-Ramp & 52nd Street

Children's Hospital
2035 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	471	0	0	421	1150	0	1140	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	471	0	0	421	1150	0	1140	0	0
Pedestrians							50			
Lane Width (ft)							12.0			
Walking Speed (ft/s)							4.0			
Percent Blockage							4			
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.79						0.79		0.79	0.79
vC, conflicting volume	1571			521			2092	286	1796	942
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1182			521			1845	286	1469	381
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	461			998			56	679	0	414

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	236	236	281	524	767	570	570
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	383	767	570	570
cSH	1700	1700	1700	1700	1700	679	679
Volume to Capacity	0.14	0.14	0.17	0.31	0.45	0.84	0.84
Queue Length 95th (ft)	0	0	0	0	0	233	233
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	31.7	31.7
Lane LOS						D	D
Approach Delay (s)	0.0		0.0			31.7	
Approach LOS						D	

Intersection Summary				
Average Delay	11.4			
Intersection Capacity Utilization	59.8%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	50	353	1008	200	90	970	180	170	290	100	170	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.98		1.00	0.99		1.00	0.98			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			0.99
Frt		1.00	0.98		1.00	0.98		1.00	0.96			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.98
Satd. Flow (prot)		1787	4924		1805	4993		1752	1737			1714
Flt Permitted		0.95	1.00		0.95	1.00		0.24	1.00			0.52
Satd. Flow (perm)		1787	4924		1805	4993		436	1737			921
Peak-hour factor, PHF	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. Flow (vph)	50	353	1008	200	90	970	180	170	290	100	170	170
RTOR Reduction (vph)	0	0	27	0	0	24	0	0	11	0	0	0
Lane Group Flow (vph)	0	403	1181	0	90	1126	0	170	379	0	0	340
Confl. Peds. (#/hr)				21	21		17			33	33	
Confl. Bikes (#/hr)				20			12			45		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		33.5	53.0		6.5	26.0		36.5	36.5			27.0
Effective Green, g (s)		33.5	53.0		6.5	26.0		36.5	36.5			27.0
Actuated g/C Ratio		0.30	0.48		0.06	0.24		0.33	0.33			0.25
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		544	2372		106	1180		210	576			226
v/s Ratio Prot		c0.23	0.24		0.05	c0.23		c0.04	0.22			
v/s Ratio Perm								0.23				c0.37
v/c Ratio		0.74	0.50		0.85	0.95		0.81	0.66			1.50
Uniform Delay, d1		34.4	19.4		51.3	41.4		33.5	31.4			41.5
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Incremental Delay, d2		8.8	0.8		43.4	17.2		20.1	5.8			248.7
Delay (s)		43.1	20.2		94.6	58.6		53.5	37.2			290.2
Level of Service		D	C		F	E		D	D			F
Approach Delay (s)			25.9			61.3			42.1			155.6
Approach LOS			C			E			D			F

Intersection Summary			
HCM 2000 Control Delay	61.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	110.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: 52nd Street & Shattuck Ave

Children's Hospital
2035 PM Plus Phase 2

Movement	SBR
Lane Configurations	
Volume (vph)	381
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.92
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1389
Flt Permitted	1.00
Satd. Flow (perm)	1389
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	381
RTOR Reduction (vph)	287
Lane Group Flow (vph)	94
Confl. Peds. (#/hr)	27
Confl. Bikes (#/hr)	41
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	27.0
Effective Green, g (s)	27.0
Actuated g/C Ratio	0.25
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	340
v/s Ratio Prot	
v/s Ratio Perm	0.07
v/c Ratio	0.28
Uniform Delay, d1	33.6
Progression Factor	1.00
Incremental Delay, d2	2.0
Delay (s)	35.6
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
15: Telegraph Ave & 52nd Street/Claremont Ave

Children's Hospital
2035 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	20	20	210	90	200	30	1196	340	200	831	326
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.94			0.98		1.00	0.91	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.95		1.00	0.90			0.97		1.00	0.96	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1642		1698	1508			3759		1770	3068	
Flt Permitted		0.98		0.95	1.00			0.90		0.95	1.00	
Satd. Flow (perm)		1642		1698	1508			3405		1770	3068	
Peak-hour factor, PHF	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. Flow (vph)	20	20	20	210	90	200	30	1196	340	200	831	326
RTOR Reduction (vph)	0	19	0	0	68	0	0	23	0	0	37	0
Lane Group Flow (vph)	0	41	0	189	243	0	0	1543	0	200	1120	0
Confl. Peds. (#/hr)	51					51	105		33			105
Confl. Bikes (#/hr)			2			15			53			72
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		6.2		19.6	19.6			43.0		13.2	60.7	
Effective Green, g (s)		6.2		19.6	19.6			43.0		13.2	60.7	
Actuated g/C Ratio		0.06		0.20	0.20			0.43		0.13	0.61	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		101		332	295			1464		233	1862	
v/s Ratio Prot		c0.03		0.11	c0.16					c0.11	0.37	
v/s Ratio Perm								c0.45				
v/c Ratio		0.41		0.57	0.83			1.05		0.86	0.60	
Uniform Delay, d1		45.1		36.4	38.6			28.5		42.5	12.2	
Progression Factor		1.80		1.00	1.00			0.50		1.00	1.00	
Incremental Delay, d2		0.8		2.2	16.9			30.6		25.4	1.4	
Delay (s)		82.0		38.6	55.5			44.7		67.9	13.6	
Level of Service		F		D	E			D		E	B	
Approach Delay (s)		82.0			49.1			44.7			21.6	
Approach LOS		F			D			D			C	

Intersection Summary				
HCM 2000 Control Delay	37.0	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	114.0%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
16: Telegraph Ave & 51St Street

Children's Hospital
2035 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	346	754	118	80	581	240	123	980	190	310	681	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.97		1.00	0.97		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.96		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3374		1787	3307		1719	3270		1752	3362	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3374		1787	3307		1719	3270		1752	3362	
Peak-hour factor, PHF	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. Flow (vph)	346	754	118	80	581	240	123	980	190	310	681	70
RTOR Reduction (vph)	0	12	0	0	44	0	0	15	0	0	8	0
Lane Group Flow (vph)	346	860	0	80	777	0	123	1155	0	310	743	0
Confl. Peds. (#/hr)			78			57			86			138
Confl. Bikes (#/hr)			12			23			51			81
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.9	29.4		8.3	23.3		8.1	32.8		13.0	38.7	
Effective Green, g (s)	14.9	29.4		8.3	23.3		8.1	32.8		13.0	38.7	
Actuated g/C Ratio	0.15	0.29		0.08	0.23		0.08	0.33		0.13	0.39	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	506	991		148	770		139	1072		227	1301	
v/s Ratio Prot	c0.10	c0.25		0.04	c0.23		0.07	c0.35		c0.18	0.22	
v/s Ratio Perm												
v/c Ratio	0.68	0.87		0.54	1.01		0.88	1.08		1.37	0.57	
Uniform Delay, d1	40.3	33.5		44.0	38.4		45.5	33.6		43.5	24.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.14	0.72	
Incremental Delay, d2	3.8	10.2		4.0	34.5		43.7	50.7		186.0	1.5	
Delay (s)	44.1	43.6		48.0	72.9		89.1	84.3		235.6	18.8	
Level of Service	D	D		D	E		F	F		F	B	
Approach Delay (s)		43.8			70.7			84.8			82.1	
Approach LOS		D			E			F			F	

Intersection Summary				
HCM 2000 Control Delay	70.1	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.04			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	99.8%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	341	0	0	0	0	1792	0	0	0	0	1792	253
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	341	0	0	0	0	1792	0	0	0	0	1792	253
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	341	0	0	0	0	1792	0	0	0	0	1792	253
Confl. Peds. (#/hr)				3								
Confl. Bikes (#/hr)									14			
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	13.0					50.0					29.0	50.0
Effective Green, g (s)	13.0					50.0					29.0	50.0
Actuated g/C Ratio	0.26					1.00					0.58	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	850					1627					2072	2814
v/s Ratio Prot	0.10										0.50	0.09
v/s Ratio Perm						c1.10						
v/c Ratio	0.40					1.10					0.86	0.09
Uniform Delay, d1	15.3					25.0					8.8	0.0
Progression Factor	1.00					1.00					2.87	1.00
Incremental Delay, d2	1.4					55.5					3.4	0.0
Delay (s)	16.7					80.5					28.8	0.0
Level of Service	B					F					C	A
Approach Delay (s)		16.7			80.5			0.0			25.3	
Approach LOS		B			F			A			C	

Intersection Summary				
HCM 2000 Control Delay	48.3	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.31			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	65.9%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	161	10	100	143	0	60	0	150	10	70	10
Peak Hour 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
Hourly flow rate (vph)	0	161	10	100	143	0	60	0	150	10	70	10

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	171	243	60	150	90
Volume Left (vph)	0	100	60	0	10
Volume Right (vph)	10	0	0	150	10
Hadj (s)	-0.02	0.12	0.50	-0.70	-0.01
Departure Headway (s)	5.0	5.0	6.2	5.0	5.4
Degree Utilization, x	0.24	0.34	0.10	0.21	0.13
Capacity (veh/h)	666	675	545	668	604
Control Delay (s)	9.5	10.6	8.7	8.1	9.2
Approach Delay (s)	9.5	10.6	8.3		9.2
Approach LOS	A	B	A		A

Intersection Summary				
Delay	9.5			
Level of Service	A			
Intersection Capacity Utilization	46.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	151	10	20	133	50	10	10	10	20	10	10
Peak Hour 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
Hourly flow rate (vph)	10	151	10	20	133	50	10	10	10	20	10	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	171	203	30	40
Volume Left (vph)	10	20	10	20
Volume Right (vph)	10	50	10	10
Hadj (s)	-0.01	-0.13	-0.13	-0.05
Departure Headway (s)	4.3	4.1	4.6	4.7
Degree Utilization, x	0.20	0.23	0.04	0.05
Capacity (veh/h)	821	853	712	699
Control Delay (s)	8.4	8.4	7.8	8.0
Approach Delay (s)	8.4	8.4	7.8	8.0
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.3	
Level of Service			A	
Intersection Capacity Utilization			28.7%	ICU Level of Service
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (veh/h)	20	390	10	20	451	40	10	20	40	40	10	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	20	390	10	20	451	40	10	20	40	40	10	20
Pedestrians		8						11			5	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		1						1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	496			411			990	982	406	1001	967	484
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	496			411			990	982	406	1001	967	484
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			95	92	94	79	96	97
cM capacity (veh/h)	1069			1148			201	239	643	187	242	577

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	420	511	70	70
Volume Left	20	20	10	40
Volume Right	10	40	40	20
cSH	1069	1148	358	241
Volume to Capacity	0.02	0.02	0.20	0.29
Queue Length 95th (ft)	1	1	18	29
Control Delay (s)	0.6	0.5	17.5	25.9
Lane LOS	A	A	C	D
Approach Delay (s)	0.6	0.5	17.5	25.9
Approach LOS			C	D

Intersection Summary				
Average Delay			3.3	
Intersection Capacity Utilization			51.2%	ICU Level of Service
Analysis Period (min)			15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	123	2140	34	0	1846
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	123	2140	34	0	1846
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			154			137
pX, platoon unblocked	0.70	0.62			0.62	
vC, conflicting volume	2772	730			2174	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	433	0			734	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	82			100	
cM capacity (veh/h)	386	670			535	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	123	856	856	462	615	615	615
Volume Left	0	0	0	0	0	0	0
Volume Right	123	0	0	34	0	0	0
cSH	670	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.18	0.50	0.50	0.27	0.36	0.36	0.36
Queue Length 95th (ft)	17	0	0	0	0	0	0
Control Delay (s)	11.6	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	11.6	0.0			0.0		
Approach LOS	B						

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	56.4%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	2133	0	0	2015
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	2133	0	0	2015
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			424			204
pX, platoon unblocked	0.72					
vC, conflicting volume	2805	711			2133	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2149	711			2133	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	30	375			251	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	0	853	853	427	672	672	672
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.50	0.50	0.25	0.40	0.40	0.40
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	0.0	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	44.5%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection Sign configuration not allowed in HCM analysis.

Appendix L

CMP Analysis Calculations

FEHR PEERS

Children's Hospital
MTS Roadway System Analysis Summary - 2020 PM (Phase 1)

Link Location	Segment Limits		# Lanes	No Project Volume	With Project Volume	V/C Ratio - No Project	V/C Ratio - With Project	No Project LOS	With Project LOS	Change from LOS E or better to LOS F	LOS F and Change in V/C >3%
Freeway Segments											
SR 24 Eastbound											
Between	I-580	MLK Jr. Way	4	6,063	6,065	0.76	0.76	D	D	No	-
Between	MLK Jr. Way	Claremont Avenue	4	7,528	7,528	0.94	0.94	E	E	No	-
Between	Claremont Avenue	Broadway	4	7,554	7,556	0.94	0.94	E	E	No	-
Between	Broadway	SR 13 Ramps	5	8,059	8,061	0.81	0.81	D	D	No	-
Between	SR 13 Ramps	Caldecott Tunnel	4	9,368	9,370	1.17	1.17	F	F	-	No
SR 24 Westbound											
Between	Caldecott Tunnel	SR 13 Ramps	4	6,427	6,428	0.80	0.80	D	D	No	-
Between	SR 13 Ramps	Broadway	5	4,730	4,731	0.47	0.47	B	B	No	-
Between	Broadway	Telegraph Avenue	4	4,280	4,281	0.53	0.54	B	B	No	-
Between	Telegraph Avenue	I-580	4	4,711	4,719	0.59	0.59	C	C	No	-
I-980 Eastbound											
Between	I-880	12th Street	2	3,429	3,430	0.86	0.86	D	D	No	-
Between	12th Street	27th Street	3	4,325	4,326	0.72	0.72	C	C	No	-
Between	27th Street	I-580	5	6,073	6,074	0.61	0.61	C	C	No	-
I-980 Westbound											
Between	I-580	27th Street	5	4,354	4,355	0.44	0.44	B	B	No	-
Between	27th Street	12th Street	3	3,441	3,442	0.57	0.57	B	B	No	-
Between	12th Street	I-880	3	3,788	3,789	0.63	0.63	C	C	No	-
I-580 Eastbound											
Between	I-80/I-580	MacArthur Blvd	4	9,112	9,113	1.14	1.14	F	F	-	No
Between	MacArthur Blvd	I-980/SR 24	5	8,549	8,550	0.85	0.85	D	D	No	-
Between	I-980/SR 24	Oakland Avenue	5	8,648	8,649	0.86	0.86	D	D	No	-
Between	Oakland Avenue	Grand Avenue	4	9,358	9,359	1.17	1.17	F	F	-	No
Between	Grand Avenue	Lakeshore Avenue	4	8,497	8,498	1.06	1.06	F	F	-	No
Between	Lakeshore Avenue	Park Blvd	5	10,059	10,060	1.01	1.01	F	F	-	No
I-580 Westbound											
Between	Park Blvd	Lakeshore Avenue	4	9,302	9,304	1.16	1.16	F	F	-	No
Between	Lakeshore Avenue	Grand Avenue	4	7,654	7,656	0.96	0.96	E	E	No	-
Between	Grand Avenue	Oakland Avenue	4	8,502	8,504	1.06	1.06	F	F	-	No
Between	Oakland Avenue	I-980/SR 24	5	7,744	7,746	0.77	0.77	D	D	No	-
Between	I-980/SR 24	I-580/I-880	3	4,323	4,325	0.72	0.72	C	C	No	-
Arterials											
Martin Luther King Jr. Way Northbound											
Between	San Pablo Ave	Grand Avenue	2	108	108	0.07	0.07	A	A	No	-
Between	Grand Avenue	27th Street	2	7	7	0.00	0.00	A	A	No	-
Between	27th Street	MacArthur Blvd	2	61	61	0.04	0.04	A	A	No	-
Between	MacArthur Blvd	40th Street	2	2	2	0.00	0.00	A	A	No	-
Between	40th Street	SR 24 Ramps	2	19	19	0.01	0.01	A	A	No	-
Betweem	SR 24 Ramps	52nd Street	2	1,763	1,765	1.10	1.10	F	F	-	No
Between	52nd Street	55th Street	2	1,928	1,975	1.21	1.23	F	F	-	No
Between	55th Street	Adeline Street	2	1,818	1,820	1.14	1.14	F	F	-	No
Between	Adeline Street	Ashby Avenue	2	1,372	1,374	0.86	0.86	D	D	No	-

Children's Hospital
MTS Roadway System Analysis Summary - 2020 PM (Phase 1)

Link Location	Segment Limits		# Lanes	No Project Volume	With Project Volume	V/C Ratio - No Project	V/C Ratio - With Project	No Project LOS	With Project LOS	Change from LOS E or better to LOS F	LOS F and Change in V/C >3%
Martin Luther King Jr. Way Southbound											
Between	Ashby Avenue	Adeline Street	2	1,256	1,257	0.79	0.79	D	D	No	-
Between	Adeline Street	55th Street	2	1,817	1,818	1.14	1.14	F	F	-	No
Between	55th Street	52nd Street	2	1,918	1,931	1.20	1.21	F	F	-	No
Between	52nd Street	SR 24 Ramps	2	1,836	1,844	1.15	1.15	F	F	-	No
Between	SR 24 Ramps	40th Street	2	2	3	0.00	0.00	A	A	No	-
Between	40th Street	MacArthur Blvd	2	1	2	0.00	0.00	A	A	No	-
Between	MacArthur Blvd	27th Street	2	40	41	0.03	0.03	A	A	No	-
Between	27th Street	Grand Avenue	2	0	1	0.00	0.00	A	A	No	-
Between	Grand Avenue	San Pablo Ave	2	58	59	0.04	0.04	A	A	No	-
Shattuck Avenue Northbound											
Between	52nd Street	55th Street	1	705	706	0.88	0.88	D	D	No	-
Between	55th Street	Alcatraz Avenue	1	1,016	1,017	1.27	1.27	F	F	-	No
Between	Alcatraz Avenue	Ashby Avenue	1	1,000	1,001	1.25	1.25	F	F	-	No
Shattuck Avenue Southbound											
Between	Ashby Avenue	Alcatraz Avenue	1	731	731	0.91	0.91	E	E	No	-
Between	Alcatraz Avenue	55th Street	1	990	990	1.24	1.24	F	F	-	No
Between	55th Street	52nd Street	1	939	939	1.17	1.17	F	F	-	No
Telegraph Avenue Northbound											
Between	51st Street	Claremont Avenue	3	1,773	1,775	0.74	0.74	C	C	No	-
Between	Claremont Avenue	SR 24 Ramps	2	2,109	2,113	1.32	1.32	F	F	-	No
Between	SR 24 Ramps	Alcatraz Avenue	2	2,093	2,094	1.31	1.31	F	F	-	No
Between	Alcatraz Avenue	Ashby Avenue	2	1,654	1,655	1.03	1.03	F	F	-	No
Telegraph Avenue Southbound											
Between	Ashby Avenue	Alcatraz Avenue	2	1,830	1,831	1.14	1.14	F	F	-	No
Between	Alcatraz Avenue	SR 24 Ramps	2	1,852	1,853	1.16	1.16	F	F	-	No
Between	SR 24 Ramps	Claremont Avenue	2	1,408	1,410	0.88	0.88	D	D	No	-
Between	Claremont Avenue	51st Street	3	1,008	1,008	0.42	0.42	B	B	No	-
Stanford Avenue Eastbound											
Between	San Pablo Ave	Market Street	2	1,140	1,141	0.71	0.71	C	C	No	-
Between	Market Street	Adeline Street	2	680	681	0.43	0.43	B	B	No	-
Stanford Avenue Westbound											
Between	Adeline Street	Market Street	2	541	542	0.34	0.34	A	A	No	-
Between	Market Street	San Pablo Ave	2	603	604	0.38	0.38	B	B	No	-
Adeline Street Northbound											
Between	Stanford Street	MLK Jr. Way	3	1,392	1,395	0.58	0.58	B	B	No	-
Between	MLK Jr. Way	Alcatraz Avenue	3	3,020	3,023	1.26	1.26	F	F	-	No
Between	Alcatraz Avenue	MLK Jr. Way	3	2,875	2,878	1.20	1.20	F	F	-	No
Between	MLK Jr. Way	Ashby Avenue	3	1,565	1,568	0.65	0.65	C	C	No	-
Between	Ashby Avenue	Shattuck Avenue	3	1,388	1,391	0.58	0.58	B	B	No	-
Adeline Street Southbound											
Between	Shattuck Avenue	Ashby Avenue	3	1,565	1,566	0.65	0.65	C	C	No	-
Between	Ashby Avenue	MLK Jr. Way	3	1,388	1,389	0.58	0.58	B	B	No	-
Between	MLK Jr. Way	Alcatraz Avenue	3	2,589	2,590	1.08	1.08	F	F	-	No
Between	Alcatraz Avenue	MLK Jr. Way	3	2,845	2,846	1.19	1.19	F	F	-	No
Between	MLK Jr. Way	Stanford Street	3	1,215	1,216	0.51	0.51	B	B	No	-

Children's Hospital
MTS Roadway System Analysis Summary - 2020 PM (Phase 1)

Link Location	Segment Limits		# Lanes	No Project Volume	With Project Volume	V/C Ratio - No Project	V/C Ratio - With Project	No Project LOS	With Project LOS	Change from LOS E or better to LOS F	LOS F and Change in V/C >3%
Claremont Avenue Northbound											
Between	Telegraph Avenue	SR 24 Ramps	2	517	517	0.32	0.32	A	A	No	-
Between	SR 24 Ramps	College Avenue	2	1,723	1,723	1.08	1.08	F	F	-	No
Claremont Avenue Southbound											
Between	College Avenue	SR 24 Ramps	2	1,769	1,769	1.11	1.11	F	F	-	No
Between	SR 24 Ramps	Telegraph Avenue	2	307	307	0.19	0.19	A	A	No	-
51st Street Eastbound											
Between	Shattuck Avenue	Telegraph Avenue	2	676	680	0.42	0.42	B	B	No	-
Between	Telegraph Avenue	Broadway	2	923	924	0.58	0.58	B	B	No	-
Between	Broadway	Piedmont Avenue	2	1,047	1,048	0.65	0.65	C	C	No	-
51st Street Westbound											
Between	Piedmont Avenue	Broadway	2	879	879	0.55	0.55	B	B	No	-
Between	Broadway	Telegraph Avenue	2	942	942	0.59	0.59	C	C	No	-
Between	Telegraph Avenue	Shattuck Avenue	2	557	559	0.35	0.35	B	B	No	-
52nd Street Eastbound											
Between	MLK Jr. Way	SR 24 Ramps	1	203	209	0.25	0.26	A	A	No	-
Between	SR 24 Ramps	Shattuck Avenue	3	1,565	1,570	0.65	0.65	C	C	No	-
Between	Shattuck Avenue	Telegraph Avenue	1	655	655	0.82	0.82	D	D	No	-
52nd Street Westbound											
Between	Telegraph Avenue	Shattuck Avenue	1	634	636	0.79	0.80	D	D	No	-
Between	Shattuck Avenue	SR 24 Ramps	2	1,550	1,552	0.97	0.97	E	E	No	-
Between	SR 24 Ramps	MLK Jr. Way	1	265	276	0.33	0.34	A	A	No	-

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Children's Hospital
MTS Roadway System Analysis Summary - 2020 PM (Phase 2)

Link Location	Segment Limits		# Lanes	No Project Volume	With Project Volume	V/C Ratio - No Project	V/C Ratio - With Project	No Project LOS	With Project LOS	Change from LOS E or better to LOS F	LOS F and Change in V/C >3%
Freeway Segments											
SR 24 Eastbound											
Between	I-580	MLK Jr. Way	4	6,063	6,075	0.76	0.76	D	D	No	-
Between	MLK Jr. Way	Claremont Avenue	4	7,528	7,528	0.94	0.94	E	E	No	-
Between	Claremont Avenue	Broadway	4	7,554	7,570	0.94	0.95	E	E	No	-
Between	Broadway	SR 13 Ramps	5	8,059	8,075	0.81	0.81	D	D	No	-
Between	SR 13 Ramps	Caldecott Tunnel	4	9,368	9,384	1.17	1.17	F	F	-	No
SR 24 Westbound											
Between	Caldecott Tunnel	SR 13 Ramps	4	6,427	6,432	0.80	0.80	D	D	No	-
Between	SR 13 Ramps	Broadway	5	4,730	4,735	0.47	0.47	B	B	No	-
Between	Broadway	Telegraph Avenue	4	4,280	4,285	0.53	0.54	B	B	No	-
Between	Telegraph Avenue	I-580	4	4,711	4,753	0.59	0.59	C	C	No	-
I-980 Eastbound											
Between	I-880	12th Street	2	3,429	3,433	0.86	0.86	D	D	No	-
Between	12th Street	27th Street	3	4,325	4,329	0.72	0.72	C	C	No	-
Between	27th Street	I-580	5	6,073	6,077	0.61	0.61	C	C	No	-
I-980 Westbound											
Between	I-580	27th Street	5	4,354	4,367	0.44	0.44	B	B	No	-
Between	27th Street	12th Street	3	3,441	3,454	0.57	0.58	B	B	No	-
Between	12th Street	I-880	3	3,788	3,801	0.63	0.63	C	C	No	-
I-580 Eastbound											
Between	I-80/I-580	MacArthur Blvd	4	9,112	9,120	1.14	1.14	F	F	-	No
Between	MacArthur Blvd	I-980/SR 24	5	8,549	8,557	0.85	0.86	D	D	No	-
Between	I-980/SR 24	Oakland Avenue	5	8,648	8,656	0.86	0.87	D	D	No	-
Between	Oakland Avenue	Grand Avenue	4	9,358	9,366	1.17	1.17	F	F	-	No
Between	Grand Avenue	Lakeshore Avenue	4	8,497	8,505	1.06	1.06	F	F	-	No
Between	Lakeshore Avenue	Park Blvd	5	10,059	10,067	1.01	1.01	F	F	-	No
I-580 Westbound											
Between	Park Blvd	Lakeshore Avenue	4	9,302	9,327	1.16	1.17	F	F	-	No
Between	Lakeshore Avenue	Grand Avenue	4	7,654	7,679	0.96	0.96	E	E	No	-
Between	Grand Avenue	Oakland Avenue	4	8,502	8,527	1.06	1.07	F	F	-	No
Between	Oakland Avenue	I-980/SR 24	5	7,744	7,769	0.77	0.78	D	D	No	-
Between	I-980/SR 24	I-580/I-880	3	4,323	4,348	0.72	0.72	C	C	No	-
Arterials											
Martin Luther King Jr. Way Northbound											
Between	San Pablo Ave	Grand Avenue	2	108	109	0.07	0.07	A	A	No	-
Between	Grand Avenue	27th Street	2	7	8	0.00	0.01	A	A	No	-
Between	27th Street	MacArthur Blvd	2	61	62	0.04	0.04	A	A	No	-
Between	MacArthur Blvd	40th Street	2	2	3	0.00	0.00	A	A	No	-
Between	40th Street	SR 24 Ramps	2	19	20	0.01	0.01	A	A	No	-
Betweem	SR 24 Ramps	52nd Street	2	1,763	1,796	1.10	1.12	F	F	-	No
Between	52nd Street	55th Street	2	1,928	1,986	1.21	1.24	F	F	-	No
Between	55th Street	Adeline Street	2	1,818	1,831	1.14	1.14	F	F	-	No
Between	Adeline Street	Ashby Avenue	2	1,372	1,385	0.86	0.87	D	D	No	-

Children's Hospital
MTS Roadway System Analysis Summary - 2020 PM (Phase 2)

Link Location	Segment Limits		# Lanes	No Project Volume	With Project Volume	V/C Ratio - No Project	V/C Ratio - With Project	No Project LOS	With Project LOS	Change from LOS E or better to LOS F	LOS F and Change in V/C >3%
Martin Luther King Jr. Way Southbound											
Between	Ashby Avenue	Adeline Street	2	1,256	1,260	0.79	0.79	D	D	No	-
Between	Adeline Street	55th Street	2	1,817	1,821	1.14	1.14	F	F	-	No
Between	55th Street	52nd Street	2	1,918	1,934	1.20	1.21	F	F	-	No
Between	52nd Street	SR 24 Ramps	2	1,836	1,878	1.15	1.17	F	F	-	No
Between	SR 24 Ramps	40th Street	2	2	6	0.00	0.00	A	A	No	-
Between	40th Street	MacArthur Blvd	2	1	5	0.00	0.00	A	A	No	-
Between	MacArthur Blvd	27th Street	2	40	44	0.03	0.03	A	A	No	-
Between	27th Street	Grand Avenue	2	0	4	0.00	0.00	A	A	No	-
Between	Grand Avenue	San Pablo Ave	2	58	62	0.04	0.04	A	A	No	-
Shattuck Avenue Northbound											
Between	52nd Street	55th Street	1	705	708	0.88	0.88	D	D	No	-
Between	55th Street	Alcatraz Avenue	1	1,016	1,019	1.27	1.27	F	F	-	No
Between	Alcatraz Avenue	Ashby Avenue	1	1,000	1,003	1.25	1.25	F	F	-	No
Shattuck Avenue Southbound											
Between	Ashby Avenue	Alcatraz Avenue	1	731	732	0.91	0.91	E	E	No	-
Between	Alcatraz Avenue	55th Street	1	990	991	1.24	1.24	F	F	-	No
Between	55th Street	52nd Street	1	939	940	1.17	1.17	F	F	-	No
Telegraph Avenue Northbound											
Between	51st Street	Claremont Avenue	3	1,773	1,793	0.74	0.75	C	C	No	-
Between	Claremont Avenue	SR 24 Ramps	2	2,109	2,129	1.32	1.33	F	F	-	No
Between	SR 24 Ramps	Alcatraz Avenue	2	2,093	2,101	1.31	1.31	F	F	-	No
Between	Alcatraz Avenue	Ashby Avenue	2	1,654	1,662	1.03	1.04	F	F	-	No
Telegraph Avenue Southbound											
Between	Ashby Avenue	Alcatraz Avenue	2	1,830	1,833	1.14	1.15	F	F	-	No
Between	Alcatraz Avenue	SR 24 Ramps	2	1,852	1,855	1.16	1.16	F	F	-	No
Between	SR 24 Ramps	Claremont Avenue	2	1,408	1,415	0.88	0.88	D	D	No	-
Between	Claremont Avenue	51st Street	3	1,008	1,009	0.42	0.42	B	B	No	-
Stanford Avenue Eastbound											
Between	San Pablo Ave	Market Street	2	1,140	1,141	0.71	0.71	C	C	No	-
Between	Market Street	Adeline Street	2	680	681	0.43	0.43	B	B	No	-
Stanford Avenue Westbound											
Between	Adeline Street	Market Street	2	541	542	0.34	0.34	A	A	No	-
Between	Market Street	San Pablo Ave	2	603	604	0.38	0.38	B	B	No	-
Adeline Street Northbound											
Between	Stanford Street	MLK Jr. Way	3	1,392	1,406	0.58	0.59	B	C	No	-
Between	MLK Jr. Way	Alcatraz Avenue	3	3,020	3,034	1.26	1.26	F	F	-	No
Between	Alcatraz Avenue	MLK Jr. Way	3	2,875	2,889	1.20	1.20	F	F	-	No
Between	MLK Jr. Way	Ashby Avenue	3	1,565	1,579	0.65	0.66	C	C	No	-
Between	Ashby Avenue	Shattuck Avenue	3	1,388	1,402	0.58	0.58	B	B	No	-
Adeline Street Southbound											
Between	Shattuck Avenue	Ashby Avenue	3	1,565	1,569	0.65	0.65	C	C	No	-
Between	Ashby Avenue	MLK Jr. Way	3	1,388	1,392	0.58	0.58	B	B	No	-
Between	MLK Jr. Way	Alcatraz Avenue	3	2,589	2,593	1.08	1.08	F	F	-	No
Between	Alcatraz Avenue	MLK Jr. Way	3	2,845	2,849	1.19	1.19	F	F	-	No
Between	MLK Jr. Way	Stanford Street	3	1,215	1,219	0.51	0.51	B	B	No	-

Children's Hospital
MTS Roadway System Analysis Summary - 2020 PM (Phase 2)

Link Location	Segment Limits		# Lanes	No Project Volume	With Project Volume	V/C Ratio - No Project	V/C Ratio - With Project	No Project LOS	With Project LOS	Change from LOS E or better to LOS F	LOS F and Change in V/C >3%
Claremont Avenue Northbound											
Between	Telegraph Avenue	SR 24 Ramps	2	517	517	0.32	0.32	A	A	No	-
Between	SR 24 Ramps	College Avenue	2	1,723	1,723	1.08	1.08	F	F	-	No
Claremont Avenue Southbound											
Between	College Avenue	SR 24 Ramps	2	1,769	1,769	1.11	1.11	F	F	-	No
Between	SR 24 Ramps	Telegraph Avenue	2	307	307	0.19	0.19	A	A	No	-
51st Street Eastbound											
Between	Shattuck Avenue	Telegraph Avenue	2	676	709	0.42	0.44	B	B	No	-
Between	Telegraph Avenue	Broadway	2	923	927	0.58	0.58	B	B	No	-
Between	Broadway	Piedmont Avenue	2	1,047	1,052	0.65	0.66	C	C	No	-
51st Street Westbound											
Between	Piedmont Avenue	Broadway	2	879	880	0.55	0.55	B	B	No	-
Between	Broadway	Telegraph Avenue	2	942	943	0.59	0.59	C	C	No	-
Between	Telegraph Avenue	Shattuck Avenue	2	557	561	0.35	0.35	B	B	No	-
52nd Street Eastbound											
Between	MLK Jr. Way	SR 24 Ramps	1	203	224	0.25	0.28	A	A	No	-
Between	SR 24 Ramps	Shattuck Avenue	3	1,565	1,602	0.65	0.67	C	C	No	-
Between	Shattuck Avenue	Telegraph Avenue	1	655	655	0.82	0.82	D	D	No	-
52nd Street Westbound											
Between	Telegraph Avenue	Shattuck Avenue	1	634	644	0.79	0.81	D	D	No	-
Between	Shattuck Avenue	SR 24 Ramps	2	1,550	1,561	0.97	0.98	E	E	No	-
Between	SR 24 Ramps	MLK Jr. Way	1	265	328	0.33	0.41	A	B	No	-

Fehr & Peers, 2014.

Children's Hospital
MTS Roadway System Analysis Summary - 2035 PM (Phase 1)

Link Location	Segment Limits		# Lanes	No Project Volume	With Project Volume	V/C Ratio - No Project	V/C Ratio - With Project	No Project LOS	With Project LOS	Change from LOS E or better to LOS F	LOS F and Change in V/C >3%
Freeway Segments											
SR 24 Eastbound											
Between	I-580	MLK Jr. Way	4	6,471	6,473	0.81	0.81	D	D	No	-
Between	MLK Jr. Way	Claremont Avenue	4	7,817	7,817	0.98	0.98	E	E	No	-
Between	Claremont Avenue	Broadway	4	7,840	7,842	0.98	0.98	E	E	No	-
Between	Broadway	SR 13 Ramps	5	8,241	8,243	0.82	0.82	D	D	No	-
Between	SR 13 Ramps	Caldecott Tunnel	4	9,244	9,246	1.16	1.16	F	F	-	No
SR 24 Westbound											
Between	Caldecott Tunnel	SR 13 Ramps	4	7,235	7,236	0.90	0.90	D	D	No	-
Between	SR 13 Ramps	Broadway	5	6,307	6,308	0.63	0.63	C	C	No	-
Between	Broadway	Telegraph Avenue	4	5,355	5,356	0.67	0.67	C	C	No	-
Between	Telegraph Avenue	I-580	4	5,824	5,832	0.73	0.73	C	C	No	-
I-980 Eastbound											
Between	I-880	12th Street	2	3,247	3,248	0.81	0.81	D	D	No	-
Between	12th Street	27th Street	3	4,174	4,175	0.70	0.70	C	C	No	-
Between	27th Street	I-580	5	6,097	6,098	0.61	0.61	C	C	No	-
I-980 Westbound											
Between	I-580	27th Street	5	4,969	4,970	0.50	0.50	B	B	No	-
Between	27th Street	12th Street	3	3,689	3,690	0.61	0.62	C	C	No	-
Between	12th Street	I-880	3	4,289	4,290	0.71	0.71	C	C	No	-
I-580 Eastbound											
Between	I-80/I-580	MacArthur Blvd	4	9,619	9,620	1.20	1.20	F	F	-	No
Between	MacArthur Blvd	I-980/SR 24	5	8,817	8,818	0.88	0.88	D	D	No	-
Between	I-980/SR 24	Oakland Avenue	5	8,638	8,639	0.86	0.86	D	D	No	-
Between	Oakland Avenue	Grand Avenue	4	9,542	9,543	1.19	1.19	F	F	-	No
Between	Grand Avenue	Lakeshore Avenue	4	8,775	8,776	1.10	1.10	F	F	-	No
Between	Lakeshore Avenue	Park Blvd	5	10,333	10,334	1.03	1.03	F	F	-	No
I-580 Westbound											
Between	Park Blvd	Lakeshore Avenue	4	10,057	10,059	1.26	1.26	F	F	-	No
Between	Lakeshore Avenue	Grand Avenue	4	8,369	8,371	1.05	1.05	F	F	-	No
Between	Grand Avenue	Oakland Avenue	4	8,761	8,763	1.10	1.10	F	F	-	No
Between	Oakland Avenue	I-980/SR 24	5	8,085	8,087	0.81	0.81	D	D	No	-
Between	I-980/SR 24	I-580/I-880	3	4,554	4,556	0.76	0.76	D	D	No	-
Arterials											
Martin Luther King Jr. Way Northbound											
Between	San Pablo Ave	Grand Avenue	2	200	200	0.12	0.12	A	A	No	-
Between	Grand Avenue	27th Street	2	15	15	0.01	0.01	A	A	No	-
Between	27th Street	MacArthur Blvd	2	105	105	0.07	0.07	A	A	No	-
Between	MacArthur Blvd	40th Street	2	10	10	0.01	0.01	A	A	No	-
Between	40th Street	SR 24 Ramps	2	68	68	0.04	0.04	A	A	No	-
Betweem	SR 24 Ramps	52nd Street	2	1,743	1,745	1.09	1.09	F	F	-	No
Between	52nd Street	55th Street	2	1,992	2,039	1.25	1.27	F	F	-	No
Between	55th Street	Adeline Street	2	2,046	2,048	1.28	1.28	F	F	-	No
Between	Adeline Street	Ashby Avenue	2	1,737	1,739	1.09	1.09	F	F	-	No

Children's Hospital
MTS Roadway System Analysis Summary - 2035 PM (Phase 1)

Link Location	Segment Limits		# Lanes	No Project Volume	With Project Volume	V/C Ratio - No Project	V/C Ratio - With Project	No Project LOS	With Project LOS	Change from LOS E or better to LOS F	LOS F and Change in V/C >3%
Martin Luther King Jr. Way Southbound											
Between	Ashby Avenue	Adeline Street	2	1,374	1,375	0.86	0.86	D	D	No	-
Between	Adeline Street	55th Street	2	2,010	2,011	1.26	1.26	F	F	-	No
Between	55th Street	52nd Street	2	1,955	1,968	1.22	1.23	F	F	-	No
Between	52nd Street	SR 24 Ramps	2	1,822	1,830	1.14	1.14	F	F	-	No
Between	SR 24 Ramps	40th Street	2	8	9	0.01	0.01	A	A	No	-
Between	40th Street	MacArthur Blvd	2	4	5	0.00	0.00	A	A	No	-
Between	MacArthur Blvd	27th Street	2	62	63	0.04	0.04	A	A	No	-
Between	27th Street	Grand Avenue	2	2	3	0.00	0.00	A	A	No	-
Between	Grand Avenue	San Pablo Ave	2	120	121	0.07	0.08	A	A	No	-
Shattuck Avenue Northbound											
Between	52nd Street	55th Street	1	701	702	0.88	0.88	D	D	No	-
Between	55th Street	Alcatraz Avenue	1	1,036	1,037	1.30	1.30	F	F	-	No
Between	Alcatraz Avenue	Ashby Avenue	1	1,012	1,013	1.27	1.27	F	F	-	No
Shattuck Avenue Southbound											
Between	Ashby Avenue	Alcatraz Avenue	1	717	717	0.90	0.90	D	D	No	-
Between	Alcatraz Avenue	55th Street	1	1,001	1,001	1.25	1.25	F	F	-	No
Between	55th Street	52nd Street	1	979	979	1.22	1.22	F	F	-	No
Telegraph Avenue Northbound											
Between	51st Street	Claremont Avenue	3	1,952	1,954	0.81	0.81	D	D	No	-
Between	Claremont Avenue	SR 24 Ramps	2	2,086	2,090	1.30	1.31	F	F	-	No
Between	SR 24 Ramps	Alcatraz Avenue	2	2,129	2,130	1.33	1.33	F	F	-	No
Between	Alcatraz Avenue	Ashby Avenue	2	1,875	1,876	1.17	1.17	F	F	-	No
Telegraph Avenue Southbound											
Between	Ashby Avenue	Alcatraz Avenue	2	1,974	1,975	1.23	1.23	F	F	-	No
Between	Alcatraz Avenue	SR 24 Ramps	2	1,952	1,953	1.22	1.22	F	F	-	No
Between	SR 24 Ramps	Claremont Avenue	2	1,418	1,420	0.89	0.89	D	D	No	-
Between	Claremont Avenue	51st Street	3	1,250	1,250	0.52	0.52	B	B	No	-
Stanford Avenue Eastbound											
Between	San Pablo Ave	Market Street	2	1,169	1,170	0.73	0.73	C	C	No	-
Between	Market Street	Adeline Street	2	696	697	0.43	0.44	B	B	No	-
Stanford Avenue Westbound											
Between	Adeline Street	Market Street	2	601	602	0.38	0.38	B	B	No	-
Between	Market Street	San Pablo Ave	2	889	890	0.56	0.56	B	B	No	-
Adeline Street Northbound											
Between	Stanford Street	MLK Jr. Way	3	1,475	1,478	0.61	0.62	C	C	No	-
Between	MLK Jr. Way	Alcatraz Avenue	3	3,116	3,119	1.30	1.30	F	F	-	No
Between	Alcatraz Avenue	MLK Jr. Way	3	2,957	2,960	1.23	1.23	F	F	-	No
Between	MLK Jr. Way	Ashby Avenue	3	1,294	1,297	0.54	0.54	B	B	No	-
Between	Ashby Avenue	Shattuck Avenue	3	1,526	1,529	0.64	0.64	C	C	No	-
Adeline Street Southbound											
Between	Shattuck Avenue	Ashby Avenue	3	1,294	1,295	0.54	0.54	B	B	No	-
Between	Ashby Avenue	MLK Jr. Way	3	1,526	1,527	0.64	0.64	C	C	No	-
Between	MLK Jr. Way	Alcatraz Avenue	3	2,830	2,831	1.18	1.18	F	F	-	No
Between	Alcatraz Avenue	MLK Jr. Way	3	2,990	2,991	1.25	1.25	F	F	-	No
Between	MLK Jr. Way	Stanford Street	3	1,379	1,380	0.57	0.57	B	B	No	-

Children's Hospital
MTS Roadway System Analysis Summary - 2035 PM (Phase 1)

Link Location	Segment Limits		# Lanes	No Project Volume	With Project Volume	V/C Ratio - No Project	V/C Ratio - With Project	No Project LOS	With Project LOS	Change from LOS E or better to LOS F	LOS F and Change in V/C >3%
Claremont Avenue Northbound											
Between	Telegraph Avenue	SR 24 Ramps	2	577	577	0.36	0.36	B	B	No	-
Between	SR 24 Ramps	College Avenue	2	1,935	1,935	1.21	1.21	F	F	-	No
Claremont Avenue Southbound											
Between	College Avenue	SR 24 Ramps	2	1,965	1,965	1.23	1.23	F	F	-	No
Between	SR 24 Ramps	Telegraph Avenue	2	383	383	0.24	0.24	A	A	No	-
51st Street Eastbound											
Between	Shattuck Avenue	Telegraph Avenue	2	772	776	0.48	0.49	B	B	No	-
Between	Telegraph Avenue	Broadway	2	1,041	1,042	0.65	0.65	C	C	No	-
Between	Broadway	Piedmont Avenue	2	1,326	1,327	0.83	0.83	D	D	No	-
51st Street Westbound											
Between	Piedmont Avenue	Broadway	2	1,144	1,144	0.71	0.71	C	C	No	-
Between	Broadway	Telegraph Avenue	2	1,027	1,027	0.64	0.64	C	C	No	-
Between	Telegraph Avenue	Shattuck Avenue	2	621	623	0.39	0.39	B	B	No	-
52nd Street Eastbound											
Between	MLK Jr. Way	SR 24 Ramps	1	239	245	0.30	0.31	A	A	No	-
Between	SR 24 Ramps	Shattuck Avenue	3	1,664	1,669	0.69	0.70	C	C	No	-
Between	Shattuck Avenue	Telegraph Avenue	1	647	647	0.81	0.81	D	D	No	-
52nd Street Westbound											
Between	Telegraph Avenue	Shattuck Avenue	1	643	645	0.80	0.81	D	D	No	-
Between	Shattuck Avenue	SR 24 Ramps	2	1,635	1,637	1.02	1.02	F	F	-	No
Between	SR 24 Ramps	MLK Jr. Way	1	343	354	0.43	0.44	B	B	No	-

Fehr & Peers, 2014.

Children's Hospital
MTS Roadway System Analysis Summary - 2035 PM (Phase 2)

Link Location	Segment Limits		# Lanes	No Project Volume	With Project Volume	V/C Ratio - No Project	V/C Ratio - With Project	No Project LOS	With Project LOS	Change from LOS E or better to LOS F	LOS F and Change in V/C >3%
Freeway Segments											
SR 24 Eastbound											
Between	I-580	MLK Jr. Way	4	6,471	6,483	0.81	0.81	D	D	No	-
Between	MLK Jr. Way	Claremont Avenue	4	7,817	7,817	0.98	0.98	E	E	No	-
Between	Claremont Avenue	Broadway	4	7,840	7,856	0.98	0.98	E	E	No	-
Between	Broadway	SR 13 Ramps	5	8,241	8,257	0.82	0.83	D	D	No	-
Between	SR 13 Ramps	Caldecott Tunnel	4	9,244	9,260	1.16	1.16	F	F	-	No
SR 24 Westbound											
Between	Caldecott Tunnel	SR 13 Ramps	4	7,235	7,240	0.90	0.90	D	D	No	-
Between	SR 13 Ramps	Broadway	5	6,307	6,312	0.63	0.63	C	C	No	-
Between	Broadway	Telegraph Avenue	4	5,355	5,360	0.67	0.67	C	C	No	-
Between	Telegraph Avenue	I-580	4	5,824	5,866	0.73	0.73	C	C	No	-
I-980 Eastbound											
Between	I-880	12th Street	2	3,247	3,251	0.81	0.81	D	D	No	-
Between	12th Street	27th Street	3	4,174	4,178	0.70	0.70	C	C	No	-
Between	27th Street	I-580	5	6,097	6,101	0.61	0.61	C	C	No	-
I-980 Westbound											
Between	I-580	27th Street	5	4,969	4,982	0.50	0.50	B	B	No	-
Between	27th Street	12th Street	3	3,689	3,702	0.61	0.62	C	C	No	-
Between	12th Street	I-880	3	4,289	4,302	0.71	0.72	C	C	No	-
I-580 Eastbound											
Between	I-80/I-580	MacArthur Blvd	4	9,619	9,627	1.20	1.20	F	F	-	No
Between	MacArthur Blvd	I-980/SR 24	5	8,817	8,825	0.88	0.88	D	D	No	-
Between	I-980/SR 24	Oakland Avenue	5	8,638	8,646	0.86	0.86	D	D	No	-
Between	Oakland Avenue	Grand Avenue	4	9,542	9,550	1.19	1.19	F	F	-	No
Between	Grand Avenue	Lakeshore Avenue	4	8,775	8,783	1.10	1.10	F	F	-	No
Between	Lakeshore Avenue	Park Blvd	5	10,333	10,341	1.03	1.03	F	F	-	No
I-580 Westbound											
Between	Park Blvd	Lakeshore Avenue	4	10,057	10,082	1.26	1.26	F	F	-	No
Between	Lakeshore Avenue	Grand Avenue	4	8,369	8,394	1.05	1.05	F	F	-	No
Between	Grand Avenue	Oakland Avenue	4	8,761	8,786	1.10	1.10	F	F	-	No
Between	Oakland Avenue	I-980/SR 24	5	8,085	8,110	0.81	0.81	D	D	No	-
Between	I-980/SR 24	I-580/I-880	3	4,554	4,579	0.76	0.76	D	D	No	-
Arterials											
Martin Luther King Jr. Way Northbound											
Between	San Pablo Ave	Grand Avenue	2	200	201	0.12	0.13	A	A	No	-
Between	Grand Avenue	27th Street	2	15	16	0.01	0.01	A	A	No	-
Between	27th Street	MacArthur Blvd	2	105	106	0.07	0.07	A	A	No	-
Between	MacArthur Blvd	40th Street	2	10	11	0.01	0.01	A	A	No	-
Between	40th Street	SR 24 Ramps	2	68	69	0.04	0.04	A	A	No	-
Betweem	SR 24 Ramps	52nd Street	2	1,743	1,776	1.09	1.11	F	F	-	No
Between	52nd Street	55th Street	2	1,992	2,050	1.25	1.28	F	F	-	No
Between	55th Street	Adeline Street	2	2,046	2,059	1.28	1.29	F	F	-	No
Between	Adeline Street	Ashby Avenue	2	1,737	1,750	1.09	1.09	F	F	-	No

Children's Hospital
MTS Roadway System Analysis Summary - 2035 PM (Phase 2)

Link Location	Segment Limits		# Lanes	No Project Volume	With Project Volume	V/C Ratio - No Project	V/C Ratio - With Project	No Project LOS	With Project LOS	Change from LOS E or better to LOS F	LOS F and Change in V/C >3%
Martin Luther King Jr. Way Southbound											
Between	Ashby Avenue	Adeline Street	2	1,374	1,378	0.86	0.86	D	D	No	-
Between	Adeline Street	55th Street	2	2,010	2,014	1.26	1.26	F	F	-	No
Between	55th Street	52nd Street	2	1,955	1,971	1.22	1.23	F	F	-	No
Between	52nd Street	SR 24 Ramps	2	1,822	1,864	1.14	1.16	F	F	-	No
Between	SR 24 Ramps	40th Street	2	8	12	0.01	0.01	A	A	No	-
Between	40th Street	MacArthur Blvd	2	4	8	0.00	0.00	A	A	No	-
Between	MacArthur Blvd	27th Street	2	62	66	0.04	0.04	A	A	No	-
Between	27th Street	Grand Avenue	2	2	6	0.00	0.00	A	A	No	-
Between	Grand Avenue	San Pablo Ave	2	120	124	0.07	0.08	A	A	No	-
Shattuck Avenue Northbound											
Between	52nd Street	55th Street	1	701	704	0.88	0.88	D	D	No	-
Between	55th Street	Alcatraz Avenue	1	1,036	1,039	1.30	1.30	F	F	-	No
Between	Alcatraz Avenue	Ashby Avenue	1	1,012	1,015	1.27	1.27	F	F	-	No
Shattuck Avenue Southbound											
Between	Ashby Avenue	Alcatraz Avenue	1	717	718	0.90	0.90	D	D	No	-
Between	Alcatraz Avenue	55th Street	1	1,001	1,002	1.25	1.25	F	F	-	No
Between	55th Street	52nd Street	1	979	980	1.22	1.22	F	F	-	No
Telegraph Avenue Northbound											
Between	51st Street	Claremont Avenue	3	1,952	1,972	0.81	0.82	D	D	No	-
Between	Claremont Avenue	SR 24 Ramps	2	2,086	2,106	1.30	1.32	F	F	-	No
Between	SR 24 Ramps	Alcatraz Avenue	2	2,129	2,137	1.33	1.34	F	F	-	No
Between	Alcatraz Avenue	Ashby Avenue	2	1,875	1,883	1.17	1.18	F	F	-	No
Telegraph Avenue Southbound											
Between	Ashby Avenue	Alcatraz Avenue	2	1,974	1,977	1.23	1.24	F	F	-	No
Between	Alcatraz Avenue	SR 24 Ramps	2	1,952	1,955	1.22	1.22	F	F	-	No
Between	SR 24 Ramps	Claremont Avenue	2	1,418	1,425	0.89	0.89	D	D	No	-
Between	Claremont Avenue	51st Street	3	1,250	1,251	0.52	0.52	B	B	No	-
Stanford Avenue Eastbound											
Between	San Pablo Ave	Market Street	2	1,169	1,170	0.73	0.73	C	C	No	-
Between	Market Street	Adeline Street	2	696	697	0.43	0.44	B	B	No	-
Stanford Avenue Westbound											
Between	Adeline Street	Market Street	2	601	602	0.38	0.38	B	B	No	-
Between	Market Street	San Pablo Ave	2	889	890	0.56	0.56	B	B	No	-
Adeline Street Northbound											
Between	Stanford Street	MLK Jr. Way	3	1,475	1,489	0.61	0.62	C	C	No	-
Between	MLK Jr. Way	Alcatraz Avenue	3	3,116	3,130	1.30	1.30	F	F	-	No
Between	Alcatraz Avenue	MLK Jr. Way	3	2,957	2,971	1.23	1.24	F	F	-	No
Between	MLK Jr. Way	Ashby Avenue	3	1,294	1,308	0.54	0.54	B	B	No	-
Between	Ashby Avenue	Shattuck Avenue	3	1,526	1,540	0.64	0.64	C	C	No	-
Adeline Street Southbound											
Between	Shattuck Avenue	Ashby Avenue	3	1,294	1,298	0.54	0.54	B	B	No	-
Between	Ashby Avenue	MLK Jr. Way	3	1,526	1,530	0.64	0.64	C	C	No	-
Between	MLK Jr. Way	Alcatraz Avenue	3	2,830	2,834	1.18	1.18	F	F	-	No
Between	Alcatraz Avenue	MLK Jr. Way	3	2,990	2,994	1.25	1.25	F	F	-	No
Between	MLK Jr. Way	Stanford Street	3	1,379	1,383	0.57	0.58	B	B	No	-

Children's Hospital
MTS Roadway System Analysis Summary - 2035 PM (Phase 2)

Link Location	Segment Limits		# Lanes	No Project Volume	With Project Volume	V/C Ratio - No Project	V/C Ratio - With Project	No Project LOS	With Project LOS	Change from LOS E or better to LOS F	LOS F and Change in V/C >3%
Claremont Avenue Northbound											
Between	Telegraph Avenue	SR 24 Ramps	2	577	577	0.36	0.36	B	B	No	-
Between	SR 24 Ramps	College Avenue	2	1,935	1,935	1.21	1.21	F	F	-	No
Claremont Avenue Southbound											
Between	College Avenue	SR 24 Ramps	2	1,965	1,965	1.23	1.23	F	F	-	No
Between	SR 24 Ramps	Telegraph Avenue	2	383	383	0.24	0.24	A	A	No	-
51st Street Eastbound											
Between	Shattuck Avenue	Telegraph Avenue	2	772	805	0.48	0.50	B	B	No	-
Between	Telegraph Avenue	Broadway	2	1,041	1,045	0.65	0.65	C	C	No	-
Between	Broadway	Piedmont Avenue	2	1,326	1,331	0.83	0.83	D	D	No	-
51st Street Westbound											
Between	Piedmont Avenue	Broadway	2	1,144	1,145	0.71	0.72	C	C	No	-
Between	Broadway	Telegraph Avenue	2	1,027	1,028	0.64	0.64	C	C	No	-
Between	Telegraph Avenue	Shattuck Avenue	2	621	625	0.39	0.39	B	B	No	-
52nd Street Eastbound											
Between	MLK Jr. Way	SR 24 Ramps	1	239	260	0.30	0.33	A	A	No	-
Between	SR 24 Ramps	Shattuck Avenue	3	1,664	1,701	0.69	0.71	C	C	No	-
Between	Shattuck Avenue	Telegraph Avenue	1	647	647	0.81	0.81	D	D	No	-
52nd Street Westbound											
Between	Telegraph Avenue	Shattuck Avenue	1	643	653	0.80	0.82	D	D	No	-
Between	Shattuck Avenue	SR 24 Ramps	2	1,635	1,646	1.02	1.03	F	F	-	No
Between	SR 24 Ramps	MLK Jr. Way	1	343	406	0.43	0.51	B	B	No	-

Fehr & Peers, 2014.

Appendix M

Queuing Analysis Summary

FEHR PEERS

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	402	328	140	1389	52	1266
v/c Ratio	0.74	0.82	0.53	0.53	0.38	0.62
Control Delay	30.9	43.8	25.5	2.7	47.6	24.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.9	43.8	25.5	2.7	47.6	24.9
Queue Length 50th (ft)	173	172	83	25	28	196
Queue Length 95th (ft)	234	231	112	4	65	300
Internal Link Dist (ft)	641	561		214		352
Turn Bay Length (ft)			120		120	
Base Capacity (vph)	703	539	265	2635	147	2035
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.61	0.53	0.53	0.35	0.62

Intersection Summary

3: 55th Street & Shattuck Ave

Existing AM

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	277	306	482	597
v/c Ratio	0.56	0.56	0.47	0.56
Control Delay	27.0	27.0	11.1	12.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	27.0	27.0	11.1	12.6
Queue Length 50th (ft)	109	123	123	165
Queue Length 95th (ft)	186	202	192	255
Internal Link Dist (ft)	597	600	202	432
Turn Bay Length (ft)				
Base Capacity (vph)	499	549	1035	1067
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.56	0.56	0.47	0.56

Intersection Summary

4: 55th Street & Telegraph Ave

Existing AM

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	227	51	58	755	27	1042
v/c Ratio	0.66	0.15	0.21	0.34	0.07	0.47
Control Delay	28.0	16.8	10.0	7.3	7.6	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.0	16.8	10.0	7.3	7.6	7.9
Queue Length 50th (ft)	73	15	9	62	4	90
Queue Length 95th (ft)	124	35	35	125	16	180
Internal Link Dist (ft)	600	153		628		434
Turn Bay Length (ft)			110		65	
Base Capacity (vph)	514	517	278	2239	409	2204
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.10	0.21	0.34	0.07	0.47

Intersection Summary

8: MLK Way & 53rd Street

Existing AM

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	42	29	21	1557	11	1551
v/c Ratio	0.13	0.10	0.16	0.41	0.09	0.41
Control Delay	9.9	16.2	47.8	4.6	20.7	2.8
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	9.9	16.2	47.8	4.8	20.7	2.8
Queue Length 50th (ft)	4	10	13	8	6	3
Queue Length 95th (ft)	24	m19	m16	286	m8	79
Internal Link Dist (ft)	491	487		57		219
Turn Bay Length (ft)			120		120	
Base Capacity (vph)	607	584	157	3822	188	3752
Starvation Cap Reductn	0	0	0	1203	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.05	0.13	0.59	0.06	0.41

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

10: MLK Way & 52nd Street

Existing AM

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	30	185	143	148	106	1522	107	1476
v/c Ratio	0.10	0.40	0.41	0.30	0.74	0.60	0.48	0.56
Control Delay	22.1	16.9	29.3	5.4	57.4	21.3	34.9	13.5
Queue Delay	0.0	0.0	16.2	2.3	0.0	0.1	0.0	0.1
Total Delay	22.1	16.9	45.5	7.7	57.4	21.3	34.9	13.7
Queue Length 50th (ft)	11	45	59	0	60	286	46	105
Queue Length 95th (ft)	31	95	106	39	m69	m323	77	173
Internal Link Dist (ft)		152	97			124		74
Turn Bay Length (ft)					120		120	
Base Capacity (vph)	411	624	486	629	148	2546	248	2659
Starvation Cap Reductn	0	0	321	364	0	0	0	326
Spillback Cap Reductn	0	0	0	4	0	148	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.30	0.87	0.56	0.72	0.63	0.43	0.63

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

11: 52nd Street & Garage

Existing AM

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	322	353	32	28
v/c Ratio	0.56	0.36	0.05	0.04
Control Delay	13.4	12.3	6.3	5.8
Queue Delay	2.3	0.0	0.0	0.0
Total Delay	15.7	12.3	6.3	5.8
Queue Length 50th (ft)	29	32	3	2
Queue Length 95th (ft)	50	61	14	12
Internal Link Dist (ft)	97	24	15	55
Turn Bay Length (ft)				
Base Capacity (vph)	573	970	649	725
Starvation Cap Reductn	140	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.74	0.36	0.05	0.04

Intersection Summary

14: 52nd Street & Shattuck Ave

Existing AM

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	325	839	24	948	154	153	232	376
v/c Ratio	0.76	0.40	0.18	0.97	0.37	0.20	0.55	0.54
Control Delay	45.3	18.7	49.7	51.2	18.7	15.7	32.2	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.3	18.7	49.7	51.2	18.7	15.7	32.2	6.0
Queue Length 50th (ft)	173	99	14	200	53	48	110	0
Queue Length 95th (ft)	#297	168	m27	#275	93	88	185	65
Internal Link Dist (ft)		112		107		500	112	
Turn Bay Length (ft)			145		100			
Base Capacity (vph)	426	2102	250	976	418	752	423	690
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.40	0.10	0.97	0.37	0.20	0.55	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

15: Telegraph Ave & 52nd Street/Claremont Ave

Lane Group	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	12	85	215	782	64	867
v/c Ratio	0.06	0.29	0.55	0.35	0.39	0.37
Control Delay	0.3	32.6	17.0	12.4	44.8	6.4
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	0.3	32.6	17.0	12.6	44.8	6.5
Queue Length 50th (ft)	0	41	34	100	35	87
Queue Length 95th (ft)	m0	83	102	154	73	171
Internal Link Dist (ft)	229		175	169		628
Turn Bay Length (ft)					80	
Base Capacity (vph)	265	499	563	2263	206	2343
Starvation Cap Reductn	0	0	0	669	0	0
Spillback Cap Reductn	0	0	3	0	0	77
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.17	0.38	0.49	0.31	0.38

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

16: Telegraph Ave & 51St Street

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	228	556	101	768	90	378	147	549
v/c Ratio	0.54	0.50	0.51	0.75	0.49	0.39	0.69	0.48
Control Delay	51.8	21.1	46.7	31.0	46.5	26.7	54.7	23.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.7
Total Delay	51.8	21.1	46.7	31.0	46.5	26.8	54.7	24.0
Queue Length 50th (ft)	71	66	55	184	49	87	58	140
Queue Length 95th (ft)	106	135	103	257	94	132	#144	197
Internal Link Dist (ft)		265		250		396		169
Turn Bay Length (ft)	145		150		100			
Base Capacity (vph)	528	1114	238	1030	229	962	233	1154
Starvation Cap Reductn	0	0	0	0	0	0	0	290
Spillback Cap Reductn	0	0	0	0	0	81	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.50	0.42	0.75	0.39	0.43	0.63	0.64

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	WBR	SBT	SBR
Lane Group Flow (vph)	148	1501	1417	233
v/c Ratio	0.25	0.92	0.62	0.08
Control Delay	17.3	13.2	9.4	0.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	17.3	13.2	9.4	0.1
Queue Length 50th (ft)	17	0	396	0
Queue Length 95th (ft)	36	#135	477	m0
Internal Link Dist (ft)			344	
Turn Bay Length (ft)				
Base Capacity (vph)	581	1627	2303	2814
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.25	0.92	0.62	0.08

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

1: MLK Way & 55th Street

Existing PM

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	420	228	210	1665	86	1308
v/c Ratio	0.82	0.64	0.55	0.66	0.51	0.72
Control Delay	43.2	37.0	22.0	8.1	53.0	31.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.2	37.0	22.0	8.1	53.0	31.9
Queue Length 50th (ft)	231	120	67	64	53	259
Queue Length 95th (ft)	316	184	143	75	101	#361
Internal Link Dist (ft)	641	561		214		352
Turn Bay Length (ft)			120		120	
Base Capacity (vph)	631	440	380	2507	203	1816
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.52	0.55	0.66	0.42	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

3: 55th Street & Shattuck Ave

Existing PM

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	405	186	583	572
v/c Ratio	0.68	0.30	0.61	0.58
Control Delay	28.1	18.0	16.0	15.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	28.1	18.0	16.0	15.4
Queue Length 50th (ft)	165	59	185	178
Queue Length 95th (ft)	266	107	286	273
Internal Link Dist (ft)	597	600	202	432
Turn Bay Length (ft)				
Base Capacity (vph)	594	630	956	982
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.68	0.30	0.61	0.58

Intersection Summary

4: 55th Street & Telegraph Ave

Existing PM

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	341	70	70	980	20	1020
v/c Ratio	0.81	0.17	0.29	0.47	0.08	0.49
Control Delay	41.4	16.6	15.5	12.2	11.3	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.4	16.6	15.5	12.2	11.3	12.3
Queue Length 50th (ft)	164	21	18	153	5	160
Queue Length 95th (ft)	239	46	57	246	19	258
Internal Link Dist (ft)	600	153		628		434
Turn Bay Length (ft)			110		65	
Base Capacity (vph)	538	545	245	2084	263	2085
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.13	0.29	0.47	0.08	0.49

Intersection Summary

8: MLK Way & 53rd Street

Existing PM

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	53	35	16	1919	12	1556
v/c Ratio	0.17	0.13	0.14	0.51	0.10	0.42
Control Delay	10.4	27.7	66.3	1.8	34.7	5.1
Queue Delay	0.0	0.0	0.0	0.3	0.0	0.0
Total Delay	10.4	27.7	66.3	2.0	34.7	5.2
Queue Length 50th (ft)	4	18	11	5	8	2
Queue Length 95th (ft)	30	m36	m16	65	m12	440
Internal Link Dist (ft)	491	487		57		219
Turn Bay Length (ft)			120		120	
Base Capacity (vph)	561	502	141	3792	169	3735
Starvation Cap Reductn	0	0	0	969	0	0
Spillback Cap Reductn	2	0	0	0	0	335
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.07	0.11	0.68	0.07	0.46

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

10: MLK Way & 52nd Street

Existing PM

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	65	213	209	191	116	1754	143	1494
v/c Ratio	0.27	0.47	0.82	0.36	0.60	0.79	0.46	0.58
Control Delay	30.5	27.1	56.5	9.7	46.8	28.4	26.0	5.5
Queue Delay	0.0	0.6	29.5	2.0	0.0	0.0	0.0	0.2
Total Delay	30.5	27.7	86.0	11.6	46.8	28.4	26.0	5.7
Queue Length 50th (ft)	31	84	91	0	69	392	96	339
Queue Length 95th (ft)	67	149	#151	59	m73	m405	126	19
Internal Link Dist (ft)		152	97			124		74
Turn Bay Length (ft)					120		120	
Base Capacity (vph)	292	554	314	607	294	2234	312	2567
Starvation Cap Reductn	0	0	104	284	0	0	0	348
Spillback Cap Reductn	0	118	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.49	1.00	0.59	0.39	0.79	0.46	0.67

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

11: 52nd Street & Garage

Existing PM

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	355	336	41	140
v/c Ratio	0.44	0.35	0.07	0.20
Control Delay	16.9	15.2	6.3	5.2
Queue Delay	2.3	0.1	0.0	0.2
Total Delay	19.2	15.3	6.3	5.4
Queue Length 50th (ft)	74	39	4	10
Queue Length 95th (ft)	m95	67	17	34
Internal Link Dist (ft)	97	24	15	55
Turn Bay Length (ft)				
Base Capacity (vph)	801	947	605	716
Starvation Cap Reductn	311	0	0	0
Spillback Cap Reductn	0	84	147	169
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.72	0.39	0.09	0.26

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

14: 52nd Street & Shattuck Ave

Existing PM

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	342	1085	35	958	146	247	283	346
v/c Ratio	0.63	0.42	0.34	0.79	0.59	0.41	0.91	0.57
Control Delay	39.0	16.6	59.0	44.0	37.3	30.0	74.1	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	16.6	59.0	44.0	37.3	30.0	74.1	7.7
Queue Length 50th (ft)	207	171	24	228	73	129	195	0
Queue Length 95th (ft)	307	209	58	280	124	203	#356	77
Internal Link Dist (ft)		112		107		500	112	
Turn Bay Length (ft)			145		100			
Base Capacity (vph)	544	2599	106	1209	249	597	311	610
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.42	0.33	0.79	0.59	0.41	0.91	0.57

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

15: Telegraph Ave & 52nd Street/Claremont Ave

Existing PM

Lane Group	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	33	89	239	1123	101	946
v/c Ratio	0.27	0.31	0.72	0.58	0.54	0.44
Control Delay	60.3	37.3	36.0	12.9	52.5	9.5
Queue Delay	1.5	0.5	4.2	0.3	0.0	0.0
Total Delay	61.8	37.8	40.1	13.3	52.5	9.5
Queue Length 50th (ft)	14	50	90	251	62	152
Queue Length 95th (ft)	m16	94	174	m356	112	220
Internal Link Dist (ft)	229		175	169		628
Turn Bay Length (ft)					80	
Base Capacity (vph)	150	382	414	1941	238	2138
Starvation Cap Reductn	0	0	0	310	0	0
Spillback Cap Reductn	47	111	108	0	0	126
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.33	0.78	0.69	0.42	0.47

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

16: Telegraph Ave & 51St Street

Existing PM

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	348	691	56	706	78	671	262	519
v/c Ratio	0.69	0.66	0.37	0.88	0.64	0.60	1.15	0.36
Control Delay	47.6	34.1	49.3	47.4	70.1	29.8	151.4	15.2
Queue Delay	0.0	0.0	0.0	0.2	0.0	8.5	0.7	0.5
Total Delay	47.6	34.1	49.3	47.6	70.1	38.2	152.0	15.7
Queue Length 50th (ft)	109	201	34	207	49	181	~205	72
Queue Length 95th (ft)	153	272	72	#310	#130	247	#365	92
Internal Link Dist (ft)		265		250		396		169
Turn Bay Length (ft)	145		150		100			
Base Capacity (vph)	578	1040	214	802	122	1125	227	1456
Starvation Cap Reductn	0	0	0	0	0	0	10	505
Spillback Cap Reductn	0	0	0	4	0	413	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.66	0.26	0.88	0.64	0.94	1.21	0.55

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

17: SB SR-24 On-Ramp & MLK Way & NB SR-24 Off-Ramp

Existing PM

Lane Group	EBL	WBR	SBT	SBR
Lane Group Flow (vph)	268	1614	1547	235
v/c Ratio	0.32	0.99	0.75	0.08
Control Delay	16.2	24.9	23.2	0.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	16.2	24.9	23.2	0.0
Queue Length 50th (ft)	32	0	495	0
Queue Length 95th (ft)	57	#212	576	0
Internal Link Dist (ft)			344	
Turn Bay Length (ft)				
Base Capacity (vph)	850	1627	2072	2814
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.32	0.99	0.75	0.08

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	430	380	170	1440	90	1380
v/c Ratio	0.76	0.88	0.64	0.60	0.63	0.72
Control Delay	31.4	49.5	30.5	5.0	60.8	28.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.4	49.5	30.5	5.0	60.8	28.0
Queue Length 50th (ft)	184	197	101	36	50	237
Queue Length 95th (ft)	260	281	#145	11	#115	#363
Internal Link Dist (ft)	641	561		214		352
Turn Bay Length (ft)			120		120	
Base Capacity (vph)	694	539	265	2391	147	1925
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.71	0.64	0.60	0.61	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	340	350	530	640
v/c Ratio	0.72	0.64	0.53	0.61
Control Delay	33.6	29.3	12.1	13.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	33.6	29.3	12.1	13.5
Queue Length 50th (ft)	143	144	142	184
Queue Length 95th (ft)	#262	234	223	285
Internal Link Dist (ft)	597	600	202	432
Turn Bay Length (ft)				
Base Capacity (vph)	473	545	1007	1056
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.72	0.64	0.53	0.61

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	260	60	70	900	40	1240
v/c Ratio	0.71	0.18	0.36	0.41	0.12	0.58
Control Delay	29.9	16.6	15.8	8.5	8.9	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.9	16.6	15.8	8.5	8.9	9.9
Queue Length 50th (ft)	86	17	13	87	6	132
Queue Length 95th (ft)	140	38	56	165	25	251
Internal Link Dist (ft)	600	153		628		434
Turn Bay Length (ft)			110		65	
Base Capacity (vph)	514	493	197	2175	324	2145
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.12	0.36	0.41	0.12	0.58

Intersection Summary

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	60	50	30	1620	20	1660
v/c Ratio	0.18	0.16	0.22	0.46	0.14	0.48
Control Delay	11.8	17.3	48.7	5.5	21.6	3.6
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0
Total Delay	11.8	17.3	48.7	5.9	21.6	3.6
Queue Length 50th (ft)	11	17	18	11	11	21
Queue Length 95th (ft)	33	m26	m20	360	m13	88
Internal Link Dist (ft)	491	487		57		219
Turn Bay Length (ft)			120		120	
Base Capacity (vph)	610	587	157	3501	188	3445
Starvation Cap Reductn	0	0	0	1182	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.09	0.19	0.70	0.11	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	40	210	170	170	140	1580	130	1570
v/c Ratio	0.14	0.44	0.55	0.33	0.95	0.68	0.52	0.60
Control Delay	22.9	19.7	33.9	5.3	81.3	23.6	35.6	14.7
Queue Delay	0.0	0.0	35.4	2.5	0.0	0.2	0.0	0.1
Total Delay	22.9	19.7	69.4	7.8	81.3	23.8	35.6	14.8
Queue Length 50th (ft)	15	58	73	0	81	303	45	113
Queue Length 95th (ft)	38	115	131	41	m#100	m329	99	199
Internal Link Dist (ft)		152	97			124		74
Turn Bay Length (ft)					120		120	
Base Capacity (vph)	380	618	419	641	148	2323	248	2608
Starvation Cap Reductn	0	0	248	356	0	0	0	198
Spillback Cap Reductn	0	0	0	5	0	160	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.34	0.99	0.60	0.95	0.73	0.52	0.65

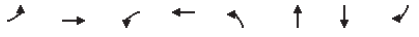
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	350	388	32	28
v/c Ratio	0.62	0.40	0.05	0.04
Control Delay	14.8	13.5	6.3	5.8
Queue Delay	3.0	0.0	0.0	0.0
Total Delay	17.8	13.5	6.3	5.8
Queue Length 50th (ft)	32	38	3	2
Queue Length 95th (ft)	54	69	14	12
Internal Link Dist (ft)	97	24	15	55
Turn Bay Length (ft)				
Base Capacity (vph)	563	963	641	711
Starvation Cap Reductn	123	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.80	0.40	0.05	0.04

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	340	910	40	1060	170	170	270	390
v/c Ratio	0.80	0.47	0.27	1.09	0.44	0.23	0.64	0.56
Control Delay	47.9	21.4	46.8	82.7	20.1	15.7	35.6	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	21.4	46.8	82.7	20.1	15.7	35.6	6.2
Queue Length 50th (ft)	182	140	23	~252	59	53	132	0
Queue Length 95th (ft)	#317	189	m39	#325	102	96	219	67
Internal Link Dist (ft)		112		107		500	112	
Turn Bay Length (ft)			145		100			
Base Capacity (vph)	426	1947	250	976	388	748	420	693
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.47	0.16	1.09	0.44	0.23	0.64	0.56

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

15: Telegraph Ave & 52nd Street/Claremont Ave

Lane Group	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	30	99	251	920	90	1040
v/c Ratio	0.23	0.34	0.64	0.49	0.51	0.49
Control Delay	48.1	33.5	21.7	18.2	48.1	10.3
Queue Delay	0.0	0.1	0.2	0.2	0.0	0.1
Total Delay	48.1	33.6	21.9	18.4	48.1	10.4
Queue Length 50th (ft)	11	48	52	150	49	169
Queue Length 95th (ft)	m17	94	130	310	96	240
Internal Link Dist (ft)	229		175	169		628
Turn Bay Length (ft)					80	
Base Capacity (vph)	164	499	562	1888	206	2133
Starvation Cap Reductn	0	0	0	323	0	0
Spillback Cap Reductn	0	54	50	0	0	137
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.22	0.49	0.59	0.44	0.52

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

16: Telegraph Ave & 51St Street

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	270	610	120	830	110	450	180	640
v/c Ratio	0.59	0.59	0.59	0.82	0.57	0.49	0.80	0.57
Control Delay	50.3	26.6	49.2	34.4	49.0	28.8	73.3	21.9
Queue Delay	0.0	0.0	0.0	0.6	0.0	1.3	0.0	0.9
Total Delay	50.3	26.6	49.2	35.0	49.0	30.1	73.3	22.8
Queue Length 50th (ft)	83	95	65	204	60	109	104	138
Queue Length 95th (ft)	121	168	120	#288	111	159	#211	174
Internal Link Dist (ft)		265		250		396		169
Turn Bay Length (ft)	145		150		100			
Base Capacity (vph)	528	1033	238	1016	229	920	233	1114
Starvation Cap Reductn	0	0	0	0	0	0	0	226
Spillback Cap Reductn	0	0	0	35	0	274	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.59	0.50	0.85	0.48	0.70	0.77	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	WBR	SBT	SBR
Lane Group Flow (vph)	190	1550	1520	250
v/c Ratio	0.33	0.95	0.66	0.09
Control Delay	18.0	17.3	10.1	0.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	18.0	17.3	10.1	0.1
Queue Length 50th (ft)	22	0	157	0
Queue Length 95th (ft)	43	#165	m501	m0
Internal Link Dist (ft)			344	
Turn Bay Length (ft)				
Base Capacity (vph)	581	1627	2303	2814
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.33	0.95	0.66	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

1: MLK Way & 55th Street

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	450	300	230	1750	130	1380
v/c Ratio	0.85	0.84	0.61	0.77	0.69	0.79
Control Delay	46.0	51.1	24.2	11.2	62.4	34.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.0	51.1	24.2	11.2	62.4	34.5
Queue Length 50th (ft)	249	168	82	100	80	289
Queue Length 95th (ft)	348	259	165	90	#156	#409
Internal Link Dist (ft)	641	561		214		352
Turn Bay Length (ft)			120		120	
Base Capacity (vph)	624	424	380	2286	203	1755
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.71	0.61	0.77	0.64	0.79

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

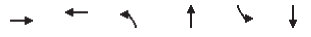
3: 55th Street & Shattuck Ave

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	480	240	650	620
v/c Ratio	0.83	0.40	0.71	0.65
Control Delay	37.3	19.8	19.1	17.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	37.3	19.8	19.1	17.0
Queue Length 50th (ft)	210	80	224	203
Queue Length 95th (ft)	#379	141	354	315
Internal Link Dist (ft)	597	600	202	432
Turn Bay Length (ft)				
Base Capacity (vph)	579	607	914	956
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.83	0.40	0.71	0.65

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

4: 55th Street & Telegraph Ave



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	390	90	90	1100	20	1100
v/c Ratio	0.86	0.21	0.45	0.55	0.10	0.55
Control Delay	44.9	16.6	23.2	14.4	12.8	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.9	16.6	23.2	14.4	12.8	14.3
Queue Length 50th (ft)	187	28	29	197	5	196
Queue Length 95th (ft)	#287	58	89	289	19	287
Internal Link Dist (ft)	600	153		628		434
Turn Bay Length (ft)			110		65	
Base Capacity (vph)	535	521	199	1990	201	1988
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.17	0.45	0.55	0.10	0.55

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: MLK Way & 53rd Street

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	80	50	20	2010	20	1620
v/c Ratio	0.25	0.19	0.17	0.55	0.16	0.44
Control Delay	12.0	27.7	65.8	2.4	35.2	5.4
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0
Total Delay	12.0	27.7	65.8	2.8	35.2	5.4
Queue Length 50th (ft)	12	25	13	6	14	4
Queue Length 95th (ft)	41	m46	m19	69	m19	452
Internal Link Dist (ft)	491	487		57		219
Turn Bay Length (ft)			120		120	
Base Capacity (vph)	565	498	141	3640	169	3714
Starvation Cap Reductn	0	0	0	927	0	0
Spillback Cap Reductn	3	0	0	0	0	348
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.10	0.14	0.74	0.12	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

10: MLK Way & 52nd Street

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	70	230	230	200	140	1830	150	1560
v/c Ratio	0.30	0.49	0.89	0.37	0.65	0.84	0.48	0.64
Control Delay	31.2	28.1	66.8	9.1	45.8	30.2	26.0	7.0
Queue Delay	0.0	0.8	59.6	1.9	0.0	0.0	0.0	0.3
Total Delay	31.2	28.8	126.5	11.0	45.8	30.2	26.0	7.2
Queue Length 50th (ft)	33	95	101	0	84	417	101	363
Queue Length 95th (ft)	72	164	#250	64	m87	m415	127	25
Internal Link Dist (ft)		152	97			124		74
Turn Bay Length (ft)					120		120	
Base Capacity (vph)	274	550	305	611	294	2183	312	2453
Starvation Cap Reductn	0	0	97	277	0	0	0	301
Spillback Cap Reductn	0	122	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.54	1.11	0.60	0.48	0.84	0.48	0.72

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

11: 52nd Street & Garage

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	372	348	41	140
v/c Ratio	0.46	0.37	0.07	0.20
Control Delay	16.8	15.4	6.3	5.3
Queue Delay	2.5	0.2	0.0	0.2
Total Delay	19.3	15.6	6.3	5.4
Queue Length 50th (ft)	75	41	4	10
Queue Length 95th (ft)	m94	70	17	34
Internal Link Dist (ft)	97	24	15	55
Turn Bay Length (ft)				
Base Capacity (vph)	802	946	597	703
Starvation Cap Reductn	304	0	0	0
Spillback Cap Reductn	0	144	147	169
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.75	0.43	0.09	0.26

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

14: 52nd Street & Shattuck Ave

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	370	1140	60	1030	160	300	300	360
v/c Ratio	0.68	0.46	0.58	0.85	0.66	0.51	1.01	0.59
Control Delay	41.0	18.0	72.6	47.2	41.8	31.9	96.4	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.0	18.0	72.6	47.2	41.8	31.9	96.4	7.9
Queue Length 50th (ft)	229	182	42	249	81	162	~214	0
Queue Length 95th (ft)	336	221	#98	305	#141	248	#394	80
Internal Link Dist (ft)		112		107		500	112	
Turn Bay Length (ft)			145		100			
Base Capacity (vph)	544	2495	106	1205	243	593	298	615
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.46	0.57	0.85	0.66	0.51	1.01	0.59

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

15: Telegraph Ave & 52nd Street/Claremont Ave

Lane Group	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	60	126	274	1290	140	1020
v/c Ratio	0.43	0.41	0.79	0.78	0.67	0.51
Control Delay	62.7	39.1	42.6	17.9	57.8	11.6
Queue Delay	3.6	1.0	10.0	3.0	0.0	0.1
Total Delay	66.3	40.1	52.6	20.9	57.8	11.6
Queue Length 50th (ft)	23	72	115	321	85	178
Queue Length 95th (ft)	m27	127	209	m#528	148	250
Internal Link Dist (ft)	229		175	169		628
Turn Bay Length (ft)					80	
Base Capacity (vph)	158	382	409	1660	238	1987
Starvation Cap Reductn	0	0	0	262	0	0
Spillback Cap Reductn	48	108	105	0	0	135
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.46	0.90	0.92	0.59	0.55

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

16: Telegraph Ave & 51St Street

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	360	760	70	760	100	810	280	600
v/c Ratio	0.70	0.74	0.43	0.95	0.75	0.73	1.23	0.45
Control Delay	48.1	37.0	50.5	58.2	80.4	33.4	178.3	16.2
Queue Delay	0.0	0.0	0.0	0.8	0.0	52.0	0.6	1.2
Total Delay	48.1	37.0	50.5	59.0	80.4	85.4	178.9	17.4
Queue Length 50th (ft)	112	230	43	232	64	233	~228	87
Queue Length 95th (ft)	158	#310	85	#354	#170	312	#395	111
Internal Link Dist (ft)		265		250		396		169
Turn Bay Length (ft)	145		150		100			
Base Capacity (vph)	578	1022	214	796	133	1115	227	1342
Starvation Cap Reductn	0	0	0	0	0	0	9	492
Spillback Cap Reductn	0	0	0	5	0	509	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.74	0.33	0.96	0.75	1.34	1.28	0.71

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

17: SB SR-24 On-Ramp & MLK Way & NB SR-24 Off-Ramp

Lane Group	EBL	WBR	SBT	SBR
Lane Group Flow (vph)	300	1670	1620	240
v/c Ratio	0.35	1.03	0.78	0.09
Control Delay	16.5	34.6	24.4	0.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	16.5	34.6	24.4	0.0
Queue Length 50th (ft)	36	~28	532	0
Queue Length 95th (ft)	63	#249	604	m0
Internal Link Dist (ft)			344	
Turn Bay Length (ft)				
Base Capacity (vph)	850	1627	2072	2814
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.35	1.03	0.78	0.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	402	328	141	1400	52	1268
v/c Ratio	0.74	0.82	0.53	0.53	0.38	0.62
Control Delay	30.9	43.8	25.8	3.1	47.6	24.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.9	43.8	25.8	3.1	47.6	24.9
Queue Length 50th (ft)	173	172	82	33	28	196
Queue Length 95th (ft)	234	231	112	5	65	300
Internal Link Dist (ft)	641	561		214		352
Turn Bay Length (ft)			120		120	
Base Capacity (vph)	703	539	265	2631	147	2035
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.61	0.53	0.53	0.35	0.62

Intersection Summary

3: 55th Street & Shattuck Ave

Existing AM Plus Phase 1

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	287	306	482	597
v/c Ratio	0.57	0.56	0.47	0.56
Control Delay	27.5	27.0	11.1	12.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	27.5	27.0	11.1	12.6
Queue Length 50th (ft)	114	123	123	165
Queue Length 95th (ft)	194	202	192	255
Internal Link Dist (ft)	597	600	202	432
Turn Bay Length (ft)				
Base Capacity (vph)	501	549	1035	1067
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.57	0.56	0.47	0.56

Intersection Summary

4: 55th Street & Telegraph Ave

Existing AM Plus Phase 1

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	237	51	58	747	27	1046
v/c Ratio	0.68	0.15	0.21	0.34	0.07	0.48
Control Delay	29.3	16.6	10.2	7.4	7.6	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.3	16.6	10.2	7.4	7.6	8.1
Queue Length 50th (ft)	78	14	9	64	4	94
Queue Length 95th (ft)	132	35	35	124	16	181
Internal Link Dist (ft)	600	153		628		434
Turn Bay Length (ft)			110		65	
Base Capacity (vph)	511	517	272	2218	407	2184
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.10	0.21	0.34	0.07	0.48

Intersection Summary

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	42	29	21	1576	11	1554
v/c Ratio	0.13	0.10	0.16	0.41	0.09	0.41
Control Delay	9.9	16.2	47.8	5.1	20.6	2.8
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	9.9	16.2	47.8	5.3	20.6	2.8
Queue Length 50th (ft)	4	10	13	10	6	3
Queue Length 95th (ft)	24	m18	m17	323	m8	79
Internal Link Dist (ft)	491	487		57		219
Turn Bay Length (ft)			120		120	
Base Capacity (vph)	607	584	157	3817	188	3752
Starvation Cap Reductn	0	0	0	1193	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.05	0.13	0.60	0.06	0.41

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	38	177	145	235	106	1528	109	1477
v/c Ratio	0.13	0.38	0.41	0.42	0.74	0.60	0.49	0.56
Control Delay	22.8	15.4	29.3	5.4	57.2	21.4	35.2	13.6
Queue Delay	0.0	0.0	16.2	2.8	0.0	0.1	0.0	0.1
Total Delay	22.8	15.4	45.5	8.2	57.2	21.5	35.2	13.7
Queue Length 50th (ft)	14	38	59	0	60	290	47	105
Queue Length 95th (ft)	37	87	108	48	m69	m324	79	174
Internal Link Dist (ft)		152	97			124		74
Turn Bay Length (ft)					120		120	
Base Capacity (vph)	409	625	490	686	148	2561	248	2657
Starvation Cap Reductn	0	0	323	339	0	0	0	325
Spillback Cap Reductn	0	0	0	7	0	164	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.28	0.87	0.68	0.72	0.64	0.44	0.63

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	214	360	32	17
v/c Ratio	0.26	0.38	0.05	0.02
Control Delay	9.6	15.8	6.3	4.6
Queue Delay	1.0	0.0	0.0	0.0
Total Delay	10.5	15.8	6.3	4.6
Queue Length 50th (ft)	18	44	3	0
Queue Length 95th (ft)	34	73	14	8
Internal Link Dist (ft)	97	24	15	55
Turn Bay Length (ft)				
Base Capacity (vph)	808	959	651	769
Starvation Cap Reductn	377	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.50	0.38	0.05	0.02

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	325	831	24	953	154	153	232	376
v/c Ratio	0.76	0.40	0.18	0.98	0.37	0.20	0.55	0.54
Control Delay	45.3	18.7	49.4	52.5	18.7	15.7	32.2	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.3	18.7	49.4	52.5	18.7	15.7	32.2	6.0
Queue Length 50th (ft)	173	97	14	202	53	48	110	0
Queue Length 95th (ft)	#297	165	m27	#278	93	88	185	65
Internal Link Dist (ft)		112		107		500	112	
Turn Bay Length (ft)			145		100			
Base Capacity (vph)	426	2100	250	976	418	752	423	690
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.40	0.10	0.98	0.37	0.20	0.55	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

15: Telegraph Ave & 52nd Street/Claremont Ave

Lane Group	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	12	85	215	774	64	871
v/c Ratio	0.06	0.29	0.55	0.34	0.39	0.37
Control Delay	0.3	32.6	17.0	12.1	44.8	6.4
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	0.3	32.6	17.0	12.3	44.8	6.4
Queue Length 50th (ft)	0	41	34	97	35	87
Queue Length 95th (ft)	m0	83	102	147	73	171
Internal Link Dist (ft)	229		175	169		628
Turn Bay Length (ft)					80	
Base Capacity (vph)	265	499	563	2260	206	2343
Starvation Cap Reductn	0	0	0	668	0	0
Spillback Cap Reductn	0	0	3	0	0	77
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.17	0.38	0.49	0.31	0.38

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

16: Telegraph Ave & 51St Street

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	220	556	101	768	91	378	147	549
v/c Ratio	0.53	0.50	0.51	0.74	0.49	0.39	0.69	0.48
Control Delay	51.5	21.1	46.7	30.8	46.5	26.7	54.7	23.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.7
Total Delay	51.5	21.1	46.7	30.8	46.5	26.8	54.7	24.1
Queue Length 50th (ft)	68	67	55	184	49	87	58	140
Queue Length 95th (ft)	102	134	103	257	95	132	#144	198
Internal Link Dist (ft)		265		250		396		169
Turn Bay Length (ft)	145		150		100			
Base Capacity (vph)	528	1113	238	1035	229	963	233	1154
Starvation Cap Reductn	0	0	0	0	0	0	0	289
Spillback Cap Reductn	0	0	0	0	0	76	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.50	0.42	0.74	0.40	0.43	0.63	0.63

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	WBR	SBT	SBR
Lane Group Flow (vph)	149	1506	1419	234
v/c Ratio	0.26	0.93	0.62	0.08
Control Delay	17.3	13.6	9.4	0.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	17.3	13.6	9.4	0.1
Queue Length 50th (ft)	17	0	398	0
Queue Length 95th (ft)	36	#138	478	m0
Internal Link Dist (ft)			344	
Turn Bay Length (ft)				
Base Capacity (vph)	581	1627	2303	2814
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.26	0.93	0.62	0.08

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	420	228	220	1715	86	1309
v/c Ratio	0.82	0.64	0.58	0.69	0.51	0.72
Control Delay	43.2	37.0	23.6	9.1	53.0	31.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.2	37.0	23.6	9.1	53.0	31.9
Queue Length 50th (ft)	231	120	76	75	53	260
Queue Length 95th (ft)	316	184	155	82	101	#361
Internal Link Dist (ft)	641	561		214		352
Turn Bay Length (ft)			120		120	
Base Capacity (vph)	631	440	380	2495	203	1816
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.52	0.58	0.69	0.42	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

3: 55th Street & Shattuck Ave

Existing PM Plus Phase 1

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	453	186	583	572
v/c Ratio	0.76	0.30	0.61	0.58
Control Delay	31.8	18.1	16.0	15.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.8	18.1	16.0	15.4
Queue Length 50th (ft)	192	59	185	178
Queue Length 95th (ft)	#335	107	286	273
Internal Link Dist (ft)	597	600	202	432
Turn Bay Length (ft)				
Base Capacity (vph)	600	628	956	982
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.76	0.30	0.61	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

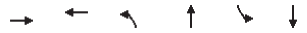
4: 55th Street & Telegraph Ave

Existing PM Plus Phase 1

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	389	70	70	937	20	1021
v/c Ratio	0.85	0.15	0.32	0.48	0.08	0.52
Control Delay	44.0	15.3	17.9	13.6	12.2	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.0	15.3	17.9	13.6	12.2	14.1
Queue Length 50th (ft)	187	19	21	162	5	182
Queue Length 95th (ft)	#298	46	59	232	18	258
Internal Link Dist (ft)	600	153		628		434
Turn Bay Length (ft)			110		65	
Base Capacity (vph)	529	540	221	1966	255	1968
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.13	0.32	0.48	0.08	0.52

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	53	35	16	2010	12	1569
v/c Ratio	0.17	0.13	0.14	0.53	0.10	0.42
Control Delay	10.4	27.7	64.9	2.6	34.8	5.1
Queue Delay	0.0	0.0	0.0	0.3	0.0	0.0
Total Delay	10.4	27.7	64.9	2.9	34.8	5.1
Queue Length 50th (ft)	4	18	11	8	8	3
Queue Length 95th (ft)	30	m36	m17	84	m12	438
Internal Link Dist (ft)	491	487		57		219
Turn Bay Length (ft)			120		120	
Base Capacity (vph)	561	502	141	3775	169	3735
Starvation Cap Reductn	0	0	0	906	0	0
Spillback Cap Reductn	2	0	0	0	0	336
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.07	0.11	0.70	0.07	0.46

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	66	212	204	207	116	1756	144	1506
v/c Ratio	0.28	0.47	0.80	0.38	0.60	0.78	0.46	0.58
Control Delay	30.6	27.2	54.6	10.5	46.7	28.3	26.1	5.5
Queue Delay	0.0	0.5	24.6	2.3	0.0	0.1	0.0	0.2
Total Delay	30.6	27.7	79.2	12.8	46.7	28.4	26.1	5.8
Queue Length 50th (ft)	31	83	84	1	69	393	96	339
Queue Length 95th (ft)	66	148	144	69	m73	m405	127	21
Internal Link Dist (ft)		152	97			124		74
Turn Bay Length (ft)					120		120	
Base Capacity (vph)	296	554	315	618	294	2244	312	2575
Starvation Cap Reductn	0	0	105	288	0	0	0	342
Spillback Cap Reductn	0	114	0	1	0	25	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.48	0.97	0.63	0.39	0.79	0.46	0.67

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues
11: 52nd Street & Garage

Children's Hospital
Existing PM Plus Phase 1

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	341	346	41	63
v/c Ratio	0.42	0.36	0.07	0.08
Control Delay	16.8	15.7	6.2	3.2
Queue Delay	2.1	0.1	0.0	0.0
Total Delay	18.8	15.8	6.3	3.3
Queue Length 50th (ft)	73	42	4	1
Queue Length 95th (ft)	m94	71	17	15
Internal Link Dist (ft)	97	24	15	55
Turn Bay Length (ft)				
Base Capacity (vph)	816	950	619	786
Starvation Cap Reductn	329	0	0	0
Spillback Cap Reductn	0	70	150	186
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.70	0.39	0.09	0.10

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues
14: 52nd Street & Shattuck Ave

Children's Hospital
Existing PM Plus Phase 1

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	342	1043	35	960	146	247	283	346
v/c Ratio	0.63	0.40	0.34	0.79	0.59	0.41	0.91	0.57
Control Delay	39.0	16.3	59.0	44.1	37.3	30.0	74.1	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	16.3	59.0	44.1	37.3	30.0	74.1	7.7
Queue Length 50th (ft)	207	161	24	228	73	129	195	0
Queue Length 95th (ft)	307	198	58	281	124	203	#356	77
Internal Link Dist (ft)		112		107		500	112	
Turn Bay Length (ft)			145		100			
Base Capacity (vph)	544	2597	106	1209	249	597	311	610
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.40	0.33	0.79	0.59	0.41	0.91	0.57

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

15: Telegraph Ave & 52nd Street/Claremont Ave

Lane Group	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	33	89	239	1080	101	948
v/c Ratio	0.27	0.31	0.72	0.56	0.54	0.44
Control Delay	60.8	37.3	36.0	12.4	52.5	9.5
Queue Delay	1.5	0.5	3.8	0.3	0.0	0.0
Total Delay	62.3	37.8	39.8	12.7	52.5	9.6
Queue Length 50th (ft)	14	50	90	247	62	152
Queue Length 95th (ft)	m16	94	174	m337	112	221
Internal Link Dist (ft)	229		175	169		628
Turn Bay Length (ft)					80	
Base Capacity (vph)	150	382	414	1938	238	2138
Starvation Cap Reductn	0	0	0	310	0	0
Spillback Cap Reductn	47	106	104	0	0	128
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.32	0.77	0.66	0.42	0.47

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

16: Telegraph Ave & 51St Street

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	305	692	56	706	79	671	262	520
v/c Ratio	0.64	0.69	0.37	0.88	0.60	0.58	1.15	0.37
Control Delay	46.9	35.3	49.3	47.4	65.3	28.9	151.0	16.0
Queue Delay	0.0	0.0	0.0	0.2	0.0	5.3	0.7	0.6
Total Delay	46.9	35.3	49.3	47.6	65.3	34.2	151.7	16.6
Queue Length 50th (ft)	95	205	34	207	49	177	~205	72
Queue Length 95th (ft)	135	273	72	#310	#131	247	#366	92
Internal Link Dist (ft)		265		250		396		169
Turn Bay Length (ft)	145		150		100			
Base Capacity (vph)	578	1009	214	802	132	1156	227	1395
Starvation Cap Reductn	0	0	0	0	0	0	10	505
Spillback Cap Reductn	0	0	0	4	0	413	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.69	0.26	0.88	0.60	0.90	1.21	0.58

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	WBR	SBT	SBR
Lane Group Flow (vph)	268	1616	1555	235
v/c Ratio	0.32	0.99	0.75	0.08
Control Delay	16.2	25.2	23.3	0.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	16.2	25.2	23.3	0.0
Queue Length 50th (ft)	32	0	501	0
Queue Length 95th (ft)	57	#212	581	0
Internal Link Dist (ft)			344	
Turn Bay Length (ft)				
Base Capacity (vph)	850	1627	2072	2814
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.32	0.99	0.75	0.08

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	402	328	141	1405	52	1277
v/c Ratio	0.74	0.82	0.53	0.53	0.38	0.63
Control Delay	30.9	43.8	25.8	2.7	47.6	25.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.9	43.8	25.8	2.7	47.6	25.0
Queue Length 50th (ft)	173	172	82	35	28	198
Queue Length 95th (ft)	234	231	111	5	65	304
Internal Link Dist (ft)	641	561		214		352
Turn Bay Length (ft)			120		120	
Base Capacity (vph)	703	539	265	2631	147	2034
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.61	0.53	0.53	0.35	0.63

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	289	311	483	597
v/c Ratio	0.58	0.57	0.47	0.56
Control Delay	27.7	27.3	11.1	12.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	27.7	27.3	11.1	12.6
Queue Length 50th (ft)	115	126	123	165
Queue Length 95th (ft)	195	206	193	255
Internal Link Dist (ft)	597	600	202	432
Turn Bay Length (ft)				
Base Capacity (vph)	500	548	1035	1067
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.58	0.57	0.47	0.56

Intersection Summary

4: 55th Street & Telegraph Ave

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	240	51	58	755	27	1067
v/c Ratio	0.69	0.15	0.22	0.34	0.07	0.49
Control Delay	29.5	16.5	10.5	7.5	7.7	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.5	16.5	10.5	7.5	7.7	8.3
Queue Length 50th (ft)	80	14	9	66	4	98
Queue Length 95th (ft)	133	35	36	127	16	189
Internal Link Dist (ft)	600	153		628		434
Turn Bay Length (ft)			110		65	
Base Capacity (vph)	510	517	262	2210	401	2175
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.10	0.22	0.34	0.07	0.49

Intersection Summary

8: MLK Way & 53rd Street

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	42	29	21	1581	11	1563
v/c Ratio	0.13	0.10	0.16	0.41	0.09	0.42
Control Delay	9.9	16.2	47.9	5.0	20.7	2.8
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	9.9	16.2	47.9	5.3	20.7	2.8
Queue Length 50th (ft)	4	10	13	10	6	3
Queue Length 95th (ft)	24	m19	m15	305	m9	79
Internal Link Dist (ft)	491	487		57		219
Turn Bay Length (ft)			120		120	
Base Capacity (vph)	607	584	157	3817	188	3752
Starvation Cap Reductn	0	0	0	1238	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.05	0.13	0.61	0.06	0.42

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	38	180	164	241	106	1583	118	1477
v/c Ratio	0.13	0.38	0.50	0.42	0.74	0.68	0.48	0.56
Control Delay	22.8	15.8	32.0	5.4	56.4	23.3	33.9	13.7
Queue Delay	0.0	0.0	30.6	2.8	0.0	0.2	0.0	0.2
Total Delay	22.8	15.8	62.6	8.2	56.4	23.5	33.9	13.9
Queue Length 50th (ft)	14	41	69	0	60	303	51	104
Queue Length 95th (ft)	37	91	124	49	m68	m332	86	175
Internal Link Dist (ft)		152	97			124		74
Turn Bay Length (ft)					120		120	
Base Capacity (vph)	388	625	446	690	148	2337	248	2632
Starvation Cap Reductn	0	0	277	337	0	0	0	326
Spillback Cap Reductn	0	0	0	7	0	161	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.29	0.97	0.68	0.72	0.73	0.48	0.64

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	282	390	15	17
v/c Ratio	0.36	0.49	0.02	0.02
Control Delay	11.6	13.2	6.5	4.6
Queue Delay	10.1	0.0	0.0	0.0
Total Delay	21.6	13.2	6.5	4.6
Queue Length 50th (ft)	53	79	2	0
Queue Length 95th (ft)	98	140	9	8
Internal Link Dist (ft)	97	24	15	55
Turn Bay Length (ft)				
Base Capacity (vph)	777	795	654	769
Starvation Cap Reductn	457	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.88	0.49	0.02	0.02

Intersection Summary

14: 52nd Street & Shattuck Ave

Existing AM Plus Phase 2

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	326	844	24	979	154	153	232	378
v/c Ratio	0.77	0.40	0.18	1.00	0.37	0.20	0.55	0.55
Control Delay	45.4	18.8	49.3	59.0	18.7	15.7	32.2	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.4	18.8	49.3	59.0	18.7	15.7	32.2	6.1
Queue Length 50th (ft)	173	100	15	~210	53	48	110	0
Queue Length 95th (ft)	#298	168	m27	#290	93	88	185	65
Internal Link Dist (ft)		112		107		500	112	
Turn Bay Length (ft)			145		100			
Base Capacity (vph)	426	2102	250	976	418	752	423	691
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.40	0.10	1.00	0.37	0.20	0.55	0.55

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

15: Telegraph Ave & 52nd Street/Claremont Ave

Existing AM Plus Phase 2

Lane Group	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	12	85	215	782	64	887
v/c Ratio	0.06	0.29	0.55	0.35	0.39	0.38
Control Delay	0.3	32.6	17.0	12.4	44.8	6.4
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	0.3	32.6	17.0	12.6	44.8	6.4
Queue Length 50th (ft)	0	41	34	100	35	88
Queue Length 95th (ft)	m0	83	102	154	73	173
Internal Link Dist (ft)	229		175	169		628
Turn Bay Length (ft)					80	
Base Capacity (vph)	265	499	563	2263	206	2339
Starvation Cap Reductn	0	0	0	669	0	0
Spillback Cap Reductn	0	0	3	0	0	76
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.17	0.38	0.49	0.31	0.39

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

16: Telegraph Ave & 51St Street

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	228	561	101	772	97	378	147	549
v/c Ratio	0.54	0.50	0.51	0.75	0.52	0.39	0.69	0.48
Control Delay	51.8	21.2	46.7	31.2	47.1	26.7	54.6	23.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.7
Total Delay	51.8	21.2	46.7	31.2	47.1	26.8	54.6	24.3
Queue Length 50th (ft)	71	66	55	186	53	87	58	141
Queue Length 95th (ft)	106	136	103	259	100	132	#145	193
Internal Link Dist (ft)		265		250		396		169
Turn Bay Length (ft)	145		150		100			
Base Capacity (vph)	528	1113	238	1030	229	962	233	1146
Starvation Cap Reductn	0	0	0	0	0	0	0	285
Spillback Cap Reductn	0	0	0	0	0	81	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.50	0.42	0.75	0.42	0.43	0.63	0.64

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

17: SB SR-24 On-Ramp & MLK Way & NB SR-24 Off-Ramp

Lane Group	EBL	WBR	SBT	SBR
Lane Group Flow (vph)	151	1535	1435	235
v/c Ratio	0.26	0.94	0.62	0.08
Control Delay	17.3	15.9	9.5	0.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	17.3	15.9	9.5	0.1
Queue Length 50th (ft)	17	0	398	0
Queue Length 95th (ft)	36	#156	477	m0
Internal Link Dist (ft)			344	
Turn Bay Length (ft)				
Base Capacity (vph)	581	1627	2303	2814
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.26	0.94	0.62	0.08

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	420	228	220	1726	86	1312
v/c Ratio	0.82	0.64	0.58	0.69	0.51	0.72
Control Delay	43.2	37.0	23.1	9.6	53.0	32.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.2	37.0	23.1	9.6	53.0	32.0
Queue Length 50th (ft)	231	120	73	90	53	260
Queue Length 95th (ft)	316	184	155	83	101	#374
Internal Link Dist (ft)	641	561		214		352
Turn Bay Length (ft)			120		120	
Base Capacity (vph)	631	440	380	2496	203	1816
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.52	0.58	0.69	0.42	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

3: 55th Street & Shattuck Ave

Existing PM Plus Phase 2

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	456	188	586	572
v/c Ratio	0.76	0.30	0.61	0.58
Control Delay	32.1	18.1	16.1	15.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	32.1	18.1	16.1	15.4
Queue Length 50th (ft)	194	59	186	178
Queue Length 95th (ft)	#339	109	289	274
Internal Link Dist (ft)	597	600	202	432
Turn Bay Length (ft)				
Base Capacity (vph)	600	626	956	981
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.76	0.30	0.61	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

4: 55th Street & Telegraph Ave

Existing PM Plus Phase 2

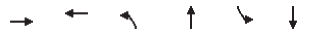
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	395	70	70	956	20	1028
v/c Ratio	0.86	0.15	0.32	0.49	0.08	0.53
Control Delay	44.7	15.2	18.3	13.9	12.4	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.7	15.2	18.3	13.9	12.4	14.3
Queue Length 50th (ft)	190	19	21	169	5	185
Queue Length 95th (ft)	#325	46	60	238	19	261
Internal Link Dist (ft)	600	153		628		434
Turn Bay Length (ft)			110		65	
Base Capacity (vph)	528	539	216	1955	245	1957
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.13	0.32	0.49	0.08	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
8: MLK Way & 53rd Street

Children's Hospital
Existing PM Plus Phase 2



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	53	35	16	2021	12	1572
v/c Ratio	0.17	0.13	0.14	0.54	0.10	0.42
Control Delay	10.4	26.3	65.2	2.7	34.8	5.1
Queue Delay	0.0	0.0	0.0	0.3	0.0	0.0
Total Delay	10.4	26.3	65.2	3.0	34.8	5.1
Queue Length 50th (ft)	4	18	10	9	8	3
Queue Length 95th (ft)	30	m33	m17	80	m12	439
Internal Link Dist (ft)	491	487		57		219
Turn Bay Length (ft)			120		120	
Base Capacity (vph)	561	502	141	3775	169	3735
Starvation Cap Reductn	0	0	0	931	0	0
Spillback Cap Reductn	2	0	0	0	0	335
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.07	0.11	0.71	0.07	0.46

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues
10: MLK Way & 52nd Street

Children's Hospital
Existing PM Plus Phase 2

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	66	213	245	218	116	1787	147	1506
v/c Ratio	0.29	0.44	0.90	0.38	0.60	0.83	0.47	0.61
Control Delay	30.8	26.0	76.1	14.0	45.9	30.2	26.3	6.3
Queue Delay	0.0	0.4	66.2	6.9	0.0	0.1	1.5	0.3
Total Delay	30.8	26.4	142.2	20.9	45.9	30.3	27.8	6.5
Queue Length 50th (ft)	31	84	167	9	69	403	98	339
Queue Length 95th (ft)	68	149	#279	103	m72	m412	130	21
Internal Link Dist (ft)		152	97			124		74
Turn Bay Length (ft)					120		120	
Base Capacity (vph)	264	554	314	626	294	2150	312	2487
Starvation Cap Reductn	0	0	176	354	0	0	0	344
Spillback Cap Reductn	0	88	0	0	0	21	62	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.46	1.78	0.80	0.39	0.84	0.59	0.70

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
11: 52nd Street & Garage

Children's Hospital
Existing PM Plus Phase 2

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	376	405	20	63
v/c Ratio	0.42	0.45	0.04	0.09
Control Delay	9.6	10.6	8.0	4.0
Queue Delay	3.4	1.1	0.1	0.1
Total Delay	13.0	11.6	8.0	4.0
Queue Length 50th (ft)	54	71	2	1
Queue Length 95th (ft)	m85	127	12	17
Internal Link Dist (ft)	97	24	15	55
Turn Bay Length (ft)				
Base Capacity (vph)	891	908	541	691
Starvation Cap Reductn	409	0	0	0
Spillback Cap Reductn	0	282	135	174
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.78	0.65	0.05	0.12

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues
14: 52nd Street & Shattuck Ave

Children's Hospital
Existing PM Plus Phase 2

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	345	1073	35	968	146	247	283	347
v/c Ratio	0.63	0.41	0.34	0.80	0.59	0.41	0.91	0.57
Control Delay	39.2	16.5	59.0	44.4	37.3	30.0	74.1	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.2	16.5	59.0	44.4	37.3	30.0	74.1	7.7
Queue Length 50th (ft)	210	168	24	231	73	129	195	0
Queue Length 95th (ft)	311	205	58	284	124	203	#356	77
Internal Link Dist (ft)		112		107		500	112	
Turn Bay Length (ft)			145		100			
Base Capacity (vph)	544	2598	106	1209	249	597	311	611
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.41	0.33	0.80	0.59	0.41	0.91	0.57

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

15: Telegraph Ave & 52nd Street/Claremont Ave

Lane Group	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	33	89	239	1099	101	953
v/c Ratio	0.27	0.31	0.72	0.57	0.54	0.45
Control Delay	60.5	37.3	36.0	12.5	52.5	9.5
Queue Delay	1.5	0.5	4.0	0.3	0.0	0.0
Total Delay	62.0	37.8	39.9	12.8	52.5	9.5
Queue Length 50th (ft)	14	50	90	249	62	153
Queue Length 95th (ft)	m16	94	174	m345	112	222
Internal Link Dist (ft)	229		175	169		628
Turn Bay Length (ft)					80	
Base Capacity (vph)	150	382	414	1937	238	2134
Starvation Cap Reductn	0	0	0	309	0	0
Spillback Cap Reductn	47	108	106	0	0	126
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.32	0.78	0.68	0.42	0.47

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

16: Telegraph Ave & 51St Street

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	324	703	56	707	81	671	262	520
v/c Ratio	0.66	0.69	0.37	0.88	0.63	0.59	1.15	0.38
Control Delay	47.2	35.1	49.3	47.5	67.9	29.3	151.1	16.2
Queue Delay	0.0	0.0	0.0	0.2	0.0	6.5	0.7	0.7
Total Delay	47.2	35.1	49.3	47.7	67.9	35.8	151.7	16.8
Queue Length 50th (ft)	101	208	34	208	51	179	~205	72
Queue Length 95th (ft)	143	278	72	#310	#135	247	#366	92
Internal Link Dist (ft)		265		250		396		169
Turn Bay Length (ft)	145		150		100			
Base Capacity (vph)	578	1021	214	802	129	1142	227	1386
Starvation Cap Reductn	0	0	0	0	0	0	10	508
Spillback Cap Reductn	0	0	0	4	0	413	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.69	0.26	0.89	0.63	0.92	1.21	0.59

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	WBR	SBT	SBR
Lane Group Flow (vph)	269	1626	1589	238
v/c Ratio	0.32	1.00	0.77	0.08
Control Delay	16.2	26.7	24.2	0.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	16.2	26.7	24.2	0.0
Queue Length 50th (ft)	32	0	503	0
Queue Length 95th (ft)	57	#219	586	m0
Internal Link Dist (ft)			344	
Turn Bay Length (ft)				
Base Capacity (vph)	850	1627	2072	2814
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.32	1.00	0.77	0.08

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	430	380	171	1451	90	1382
v/c Ratio	0.76	0.88	0.65	0.61	0.63	0.72
Control Delay	31.4	49.5	30.8	5.3	60.8	28.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.4	49.5	30.8	5.3	60.8	28.0
Queue Length 50th (ft)	184	197	101	46	50	237
Queue Length 95th (ft)	260	281	#146	11	#115	#364
Internal Link Dist (ft)	641	561		214		352
Turn Bay Length (ft)			120		120	
Base Capacity (vph)	694	539	265	2389	147	1925
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.71	0.65	0.61	0.61	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	350	350	530	640
v/c Ratio	0.74	0.64	0.53	0.61
Control Delay	34.6	29.3	12.1	13.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.6	29.3	12.1	13.5
Queue Length 50th (ft)	149	144	142	184
Queue Length 95th (ft)	#272	234	223	285
Internal Link Dist (ft)	597	600	202	432
Turn Bay Length (ft)				
Base Capacity (vph)	475	545	1007	1056
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.74	0.64	0.53	0.61

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	270	60	70	892	40	1244
v/c Ratio	0.73	0.17	0.37	0.42	0.12	0.59
Control Delay	30.6	16.2	16.9	8.7	9.2	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.6	16.2	16.9	8.7	9.2	10.3
Queue Length 50th (ft)	91	17	13	89	6	138
Queue Length 95th (ft)	146	37	59	168	25	260
Internal Link Dist (ft)	600	153		628		434
Turn Bay Length (ft)			110		65	
Base Capacity (vph)	510	494	190	2148	322	2118
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.12	0.37	0.42	0.12	0.59

Intersection Summary

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	60	50	30	1639	20	1663
v/c Ratio	0.18	0.16	0.22	0.47	0.14	0.48
Control Delay	11.8	17.5	48.4	6.2	21.7	3.7
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0
Total Delay	11.8	17.5	48.4	6.6	21.7	3.7
Queue Length 50th (ft)	11	17	18	14	11	21
Queue Length 95th (ft)	33	m26	m22	372	m13	88
Internal Link Dist (ft)	491	487		57		219
Turn Bay Length (ft)			120		120	
Base Capacity (vph)	610	587	157	3501	188	3445
Starvation Cap Reductn	0	0	0	1171	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.09	0.19	0.70	0.11	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	48	202	172	257	140	1586	132	1571
v/c Ratio	0.17	0.43	0.55	0.45	0.95	0.68	0.53	0.60
Control Delay	23.5	18.1	33.8	6.4	81.0	23.8	35.9	14.7
Queue Delay	0.0	0.0	36.7	3.3	0.0	0.2	0.0	0.1
Total Delay	23.5	18.1	70.5	9.6	81.0	24.0	35.9	14.8
Queue Length 50th (ft)	19	52	74	6	81	306	46	114
Queue Length 95th (ft)	44	106	132	57	m#98	m331	101	200
Internal Link Dist (ft)		152	97			124		74
Turn Bay Length (ft)					120		120	
Base Capacity (vph)	378	619	424	688	148	2334	248	2606
Starvation Cap Reductn	0	0	252	330	0	0	0	199
Spillback Cap Reductn	0	0	0	8	0	177	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.33	1.00	0.72	0.95	0.74	0.53	0.65

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	242	395	32	17
v/c Ratio	0.30	0.41	0.05	0.02
Control Delay	9.8	16.2	6.3	4.6
Queue Delay	1.2	0.0	0.0	0.0
Total Delay	11.0	16.2	6.3	4.6
Queue Length 50th (ft)	21	48	3	0
Queue Length 95th (ft)	38	80	14	8
Internal Link Dist (ft)	97	24	15	55
Turn Bay Length (ft)				
Base Capacity (vph)	808	959	642	769
Starvation Cap Reductn	368	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.55	0.41	0.05	0.02

Intersection Summary

14: 52nd Street & Shattuck Ave

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	340	902	40	1065	170	170	270	390
v/c Ratio	0.80	0.46	0.27	1.09	0.44	0.23	0.64	0.56
Control Delay	47.9	21.3	46.8	84.7	20.1	15.7	35.6	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	21.3	46.8	84.7	20.1	15.7	35.6	6.2
Queue Length 50th (ft)	182	139	24	~254	59	53	132	0
Queue Length 95th (ft)	#317	187	m39	#329	102	96	219	67
Internal Link Dist (ft)		112		107		500	112	
Turn Bay Length (ft)			145		100			
Base Capacity (vph)	426	1946	250	976	388	748	420	693
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.46	0.16	1.09	0.44	0.23	0.64	0.56

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

15: Telegraph Ave & 52nd Street/Claremont Ave

Lane Group	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	30	99	251	912	90	1044
v/c Ratio	0.23	0.34	0.64	0.48	0.51	0.49
Control Delay	48.4	33.5	21.7	17.9	48.1	10.3
Queue Delay	0.0	0.1	0.2	0.2	0.0	0.1
Total Delay	48.4	33.6	21.9	18.1	48.1	10.4
Queue Length 50th (ft)	11	48	52	136	49	169
Queue Length 95th (ft)	m17	94	130	307	96	240
Internal Link Dist (ft)	229		175	169		628
Turn Bay Length (ft)					80	
Base Capacity (vph)	164	499	562	1888	206	2134
Starvation Cap Reductn	0	0	0	323	0	0
Spillback Cap Reductn	0	54	50	0	0	139
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.22	0.49	0.58	0.44	0.52

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

16: Telegraph Ave & 51St Street

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	262	610	120	830	111	450	180	640
v/c Ratio	0.58	0.59	0.59	0.81	0.57	0.49	0.80	0.58
Control Delay	50.0	26.5	49.2	34.0	49.1	28.8	73.2	21.9
Queue Delay	0.0	0.0	0.0	0.5	0.0	1.2	0.0	0.9
Total Delay	50.0	26.5	49.2	34.5	49.1	30.0	73.2	22.8
Queue Length 50th (ft)	80	95	65	204	60	109	104	140
Queue Length 95th (ft)	117	168	120	#288	113	159	#211	175
Internal Link Dist (ft)		265		250		396		169
Turn Bay Length (ft)	145		150		100			
Base Capacity (vph)	528	1033	238	1023	229	920	233	1113
Starvation Cap Reductn	0	0	0	0	0	0	0	226
Spillback Cap Reductn	0	0	0	31	0	267	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.59	0.50	0.84	0.48	0.69	0.77	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

17: SB SR-24 On-Ramp & MLK Way & NB SR-24 Off-Ramp

Lane Group	EBL	WBR	SBT	SBR
Lane Group Flow (vph)	191	1555	1522	251
v/c Ratio	0.33	0.96	0.66	0.09
Control Delay	18.0	17.8	10.2	0.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	18.0	17.8	10.2	0.1
Queue Length 50th (ft)	22	0	157	0
Queue Length 95th (ft)	44	#168	m502	m0
Internal Link Dist (ft)			344	
Turn Bay Length (ft)				
Base Capacity (vph)	581	1627	2303	2814
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.33	0.96	0.66	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	450	300	240	1800	130	1381
v/c Ratio	0.85	0.84	0.63	0.79	0.69	0.79
Control Delay	46.0	51.1	25.5	12.1	62.4	34.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.0	51.1	25.5	12.1	62.4	34.6
Queue Length 50th (ft)	249	168	91	113	80	289
Queue Length 95th (ft)	348	259	176	#179	#156	#409
Internal Link Dist (ft)	641	561		214		352
Turn Bay Length (ft)			120		120	
Base Capacity (vph)	624	424	380	2277	203	1755
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.71	0.63	0.79	0.64	0.79

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

3: 55th Street & Shattuck Ave

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	528	240	650	620
v/c Ratio	0.90	0.40	0.71	0.65
Control Delay	45.5	19.9	19.1	17.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	45.5	19.9	19.1	17.0
Queue Length 50th (ft)	242	80	224	203
Queue Length 95th (ft)	#434	141	354	315
Internal Link Dist (ft)	597	600	202	432
Turn Bay Length (ft)				
Base Capacity (vph)	585	600	914	956
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.90	0.40	0.71	0.65

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

4: 55th Street & Telegraph Ave

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	438	90	90	1057	20	1101
v/c Ratio	0.91	0.19	0.51	0.56	0.10	0.58
Control Delay	49.9	15.7	27.5	15.6	13.4	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.9	15.7	27.5	15.6	13.4	15.9
Queue Length 50th (ft)	209	25	33	209	6	220
Queue Length 95th (ft)	#381	58	#98	273	19	287
Internal Link Dist (ft)	600	153		628		434
Turn Bay Length (ft)			110		65	
Base Capacity (vph)	528	518	178	1889	195	1887
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.17	0.51	0.56	0.10	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: MLK Way & 53rd Street

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	80	50	20	2101	20	1633
v/c Ratio	0.25	0.19	0.17	0.58	0.16	0.44
Control Delay	12.0	27.7	64.3	3.6	35.2	5.4
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0
Total Delay	12.0	27.7	64.3	4.0	35.2	5.5
Queue Length 50th (ft)	12	25	13	9	14	4
Queue Length 95th (ft)	41	m46	m20	#89	m20	454
Internal Link Dist (ft)	491	487		57		219
Turn Bay Length (ft)			120		120	
Base Capacity (vph)	565	498	141	3626	169	3714
Starvation Cap Reductn	0	0	0	870	0	0
Spillback Cap Reductn	3	0	0	0	0	353
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.10	0.14	0.76	0.12	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

10: MLK Way & 52nd Street

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	71	229	225	216	140	1832	151	1572
v/c Ratio	0.30	0.49	0.88	0.39	0.65	0.83	0.48	0.64
Control Delay	31.3	28.2	65.1	10.1	45.9	30.0	26.1	7.0
Queue Delay	0.0	0.7	53.7	2.2	0.0	0.2	0.0	0.3
Total Delay	31.3	28.9	118.8	12.4	45.9	30.1	26.1	7.2
Queue Length 50th (ft)	34	94	94	1	85	418	101	365
Queue Length 95th (ft)	72	163	#236	70	m87	m415	128	26
Internal Link Dist (ft)		152	97			124		74
Turn Bay Length (ft)					120		120	
Base Capacity (vph)	279	549	306	622	294	2198	312	2465
Starvation Cap Reductn	0	0	98	281	0	0	0	296
Spillback Cap Reductn	0	118	0	1	0	37	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.53	1.08	0.63	0.48	0.85	0.48	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	358	358	41	63
v/c Ratio	0.44	0.38	0.07	0.08
Control Delay	16.6	15.9	6.2	3.2
Queue Delay	2.3	0.2	0.0	0.0
Total Delay	18.9	16.0	6.3	3.3
Queue Length 50th (ft)	74	43	4	1
Queue Length 95th (ft)	m93	73	17	15
Internal Link Dist (ft)	97	24	15	55
Turn Bay Length (ft)				
Base Capacity (vph)	815	949	611	786
Starvation Cap Reductn	320	0	0	0
Spillback Cap Reductn	0	127	151	190
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.72	0.44	0.09	0.11

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	370	1098	60	1032	160	300	300	360
v/c Ratio	0.68	0.44	0.58	0.86	0.66	0.51	1.01	0.59
Control Delay	41.0	17.7	72.6	47.4	41.8	31.9	96.4	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.0	17.7	72.6	47.4	41.8	31.9	96.4	7.9
Queue Length 50th (ft)	229	172	42	250	81	162	~214	0
Queue Length 95th (ft)	336	210	#98	305	#141	248	#394	80
Internal Link Dist (ft)		112		107		500	112	
Turn Bay Length (ft)			145		100			
Base Capacity (vph)	544	2494	106	1205	243	593	298	615
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.44	0.57	0.86	0.66	0.51	1.01	0.59

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

15: Telegraph Ave & 52nd Street/Claremont Ave

Lane Group	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	60	126	274	1247	140	1022
v/c Ratio	0.43	0.41	0.79	0.75	0.67	0.51
Control Delay	62.9	39.1	42.6	17.1	57.8	11.6
Queue Delay	3.6	0.9	8.8	2.0	0.0	0.1
Total Delay	66.6	40.0	51.4	19.1	57.8	11.6
Queue Length 50th (ft)	23	72	115	317	85	179
Queue Length 95th (ft)	m27	127	209	m#495	148	250
Internal Link Dist (ft)	229		175	169		628
Turn Bay Length (ft)					80	
Base Capacity (vph)	158	382	409	1658	238	1987
Starvation Cap Reductn	0	0	0	261	0	0
Spillback Cap Reductn	48	103	101	0	0	135
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.45	0.89	0.89	0.59	0.55

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

16: Telegraph Ave & 51St Street

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	317	761	70	760	101	810	280	601
v/c Ratio	0.66	0.77	0.43	0.95	0.70	0.71	1.23	0.45
Control Delay	47.1	38.4	50.5	58.2	71.9	32.4	178.0	16.1
Queue Delay	0.0	0.0	0.0	0.8	0.0	51.9	0.6	1.1
Total Delay	47.1	38.4	50.5	59.0	71.9	84.3	178.6	17.3
Queue Length 50th (ft)	99	234	43	232	64	228	~228	87
Queue Length 95th (ft)	140	#310	85	#354	#171	312	#395	111
Internal Link Dist (ft)		265		250		396		169
Turn Bay Length (ft)	145		150		100			
Base Capacity (vph)	578	994	214	796	145	1142	227	1348
Starvation Cap Reductn	0	0	0	0	0	0	9	492
Spillback Cap Reductn	0	0	0	5	0	515	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.77	0.33	0.96	0.70	1.29	1.28	0.70

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	WBR	SBT	SBR
Lane Group Flow (vph)	300	1672	1628	240
v/c Ratio	0.35	1.03	0.79	0.09
Control Delay	16.5	35.0	24.5	0.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	16.5	35.0	24.5	0.0
Queue Length 50th (ft)	36	~29	539	0
Queue Length 95th (ft)	63	#251	608	m0
Internal Link Dist (ft)			344	
Turn Bay Length (ft)				
Base Capacity (vph)	850	1627	2072	2814
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.35	1.03	0.79	0.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	430	380	171	1456	90	1391
v/c Ratio	0.76	0.88	0.65	0.61	0.63	0.72
Control Delay	31.4	49.5	30.5	5.1	60.8	28.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.4	49.5	30.5	5.1	60.8	28.1
Queue Length 50th (ft)	184	197	101	48	50	239
Queue Length 95th (ft)	260	281	#146	11	#115	#368
Internal Link Dist (ft)	641	561		214		352
Turn Bay Length (ft)			120		120	
Base Capacity (vph)	694	539	265	2389	147	1925
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.71	0.65	0.61	0.61	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	352	355	531	640
v/c Ratio	0.74	0.65	0.53	0.61
Control Delay	35.2	29.8	12.1	13.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	35.2	29.8	12.1	13.5
Queue Length 50th (ft)	151	147	142	184
Queue Length 95th (ft)	#277	239	224	285
Internal Link Dist (ft)	597	600	202	432
Turn Bay Length (ft)				
Base Capacity (vph)	473	542	1006	1056
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.74	0.65	0.53	0.61

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

4: 55th Street & Telegraph Ave

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	273	60	70	900	40	1265
v/c Ratio	0.73	0.17	0.38	0.42	0.13	0.60
Control Delay	30.8	16.1	17.8	8.9	9.3	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.8	16.1	17.8	8.9	9.3	10.6
Queue Length 50th (ft)	92	17	13	91	6	143
Queue Length 95th (ft)	147	37	#62	172	26	269
Internal Link Dist (ft)	600	153		628		434
Turn Bay Length (ft)			110		65	
Base Capacity (vph)	509	494	183	2141	317	2111
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.12	0.38	0.42	0.13	0.60

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: MLK Way & 53rd Street

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	60	50	30	1644	20	1672
v/c Ratio	0.18	0.16	0.22	0.47	0.14	0.49
Control Delay	11.8	17.3	48.8	6.2	21.6	3.7
Queue Delay	0.0	0.0	0.0	0.5	0.0	0.0
Total Delay	11.8	17.3	48.8	6.7	21.6	3.7
Queue Length 50th (ft)	11	17	19	15	11	21
Queue Length 95th (ft)	33	m26	m21	383	m13	88
Internal Link Dist (ft)	491	487		57		219
Turn Bay Length (ft)			120		120	
Base Capacity (vph)	610	587	157	3501	188	3445
Starvation Cap Reductn	0	0	0	1218	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.09	0.19	0.72	0.11	0.49

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

10: MLK Way & 52nd Street

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	48	205	191	263	140	1641	141	1571
v/c Ratio	0.18	0.42	0.65	0.45	0.95	0.72	0.57	0.61
Control Delay	23.6	18.4	38.1	6.6	79.5	24.6	37.1	14.9
Queue Delay	0.0	0.0	65.6	3.5	0.0	0.3	0.0	0.1
Total Delay	23.6	18.4	103.7	10.1	79.5	24.9	37.1	15.0
Queue Length 50th (ft)	19	54	84	8	82	321	49	114
Queue Length 95th (ft)	44	109	151	60	m#97	m339	111	201
Internal Link Dist (ft)		152	97			124		74
Turn Bay Length (ft)					120		120	
Base Capacity (vph)	358	619	392	688	148	2288	248	2572
Starvation Cap Reductn	0	0	218	328	0	0	0	199
Spillback Cap Reductn	0	0	0	8	0	181	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.33	1.10	0.73	0.95	0.78	0.57	0.66

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

11: 52nd Street & Garage

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	310	425	15	17
v/c Ratio	0.40	0.53	0.02	0.02
Control Delay	12.0	13.9	6.5	4.6
Queue Delay	15.5	0.0	0.0	0.0
Total Delay	27.5	13.9	6.5	4.6
Queue Length 50th (ft)	59	87	2	0
Queue Length 95th (ft)	109	155	9	8
Internal Link Dist (ft)	97	24	15	55
Turn Bay Length (ft)				
Base Capacity (vph)	777	795	645	769
Starvation Cap Reductn	447	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.94	0.53	0.02	0.02

Intersection Summary

14: 52nd Street & Shattuck Ave

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	341	915	40	1091	170	170	270	392
v/c Ratio	0.80	0.47	0.27	1.12	0.44	0.23	0.64	0.56
Control Delay	48.1	21.4	46.7	94.9	20.1	15.7	35.6	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.1	21.4	46.7	94.9	20.1	15.7	35.6	6.2
Queue Length 50th (ft)	183	141	23	~266	59	53	132	0
Queue Length 95th (ft)	#319	190	m39	#341	102	96	219	67
Internal Link Dist (ft)		112		107		500	112	
Turn Bay Length (ft)			145		100			
Base Capacity (vph)	426	1947	250	976	388	748	420	695
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.47	0.16	1.12	0.44	0.23	0.64	0.56

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

15: Telegraph Ave & 52nd Street/Claremont Ave

Lane Group	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	30	99	251	920	90	1060
v/c Ratio	0.23	0.34	0.64	0.49	0.51	0.50
Control Delay	48.2	33.5	21.7	18.2	48.1	10.4
Queue Delay	0.0	0.1	0.2	0.2	0.0	0.1
Total Delay	48.2	33.6	21.9	18.4	48.1	10.4
Queue Length 50th (ft)	11	48	52	153	49	172
Queue Length 95th (ft)	m16	94	130	310	96	244
Internal Link Dist (ft)	229		175	169		628
Turn Bay Length (ft)					80	
Base Capacity (vph)	164	499	562	1886	206	2130
Starvation Cap Reductn	0	0	0	322	0	0
Spillback Cap Reductn	0	54	50	0	0	137
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.22	0.49	0.59	0.44	0.53

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

16: Telegraph Ave & 51St Street

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	270	615	120	834	117	450	180	640
v/c Ratio	0.59	0.59	0.59	0.82	0.59	0.49	0.80	0.58
Control Delay	50.3	26.7	49.2	34.7	50.0	28.8	73.0	22.0
Queue Delay	0.0	0.0	0.0	0.6	0.0	1.3	0.0	0.9
Total Delay	50.3	26.7	49.2	35.3	50.0	30.1	73.0	22.9
Queue Length 50th (ft)	83	96	65	206	63	109	104	142
Queue Length 95th (ft)	120	170	120	#292	118	159	#211	173
Internal Link Dist (ft)		265		250		396		169
Turn Bay Length (ft)	145		150		100			
Base Capacity (vph)	528	1034	238	1016	229	920	233	1109
Starvation Cap Reductn	0	0	0	0	0	0	0	226
Spillback Cap Reductn	0	0	0	35	0	274	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.59	0.50	0.85	0.51	0.70	0.77	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

17: SB SR-24 On-Ramp & MLK Way & NB SR-24 Off-Ramp

Lane Group	EBL	WBR	SBT	SBR
Lane Group Flow (vph)	193	1584	1538	252
v/c Ratio	0.33	0.97	0.67	0.09
Control Delay	18.0	21.1	10.2	0.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	18.0	21.1	10.2	0.1
Queue Length 50th (ft)	22	0	157	0
Queue Length 95th (ft)	44	#186	m501	m0
Internal Link Dist (ft)			344	
Turn Bay Length (ft)				
Base Capacity (vph)	581	1627	2303	2814
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.33	0.97	0.67	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	450	300	240	1811	130	1384
v/c Ratio	0.85	0.84	0.63	0.80	0.69	0.79
Control Delay	46.0	51.1	24.7	12.5	62.4	34.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.0	51.1	24.7	12.5	62.4	34.6
Queue Length 50th (ft)	249	168	89	115	80	290
Queue Length 95th (ft)	348	259	176	#208	#156	#411
Internal Link Dist (ft)	641	561		214		352
Turn Bay Length (ft)			120		120	
Base Capacity (vph)	624	424	380	2277	203	1755
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.71	0.63	0.80	0.64	0.79

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

3: 55th Street & Shattuck Ave

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	531	242	653	620
v/c Ratio	0.91	0.41	0.72	0.65
Control Delay	46.2	20.1	19.3	17.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	46.2	20.1	19.3	17.0
Queue Length 50th (ft)	244	81	226	203
Queue Length 95th (ft)	#438	143	358	315
Internal Link Dist (ft)	597	600	202	432
Turn Bay Length (ft)				
Base Capacity (vph)	585	596	913	956
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.91	0.41	0.72	0.65

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

4: 55th Street & Telegraph Ave

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	444	90	90	1076	20	1108
v/c Ratio	0.91	0.19	0.52	0.57	0.11	0.59
Control Delay	50.4	15.6	28.7	16.0	13.6	16.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.4	15.6	28.7	16.0	13.6	16.1
Queue Length 50th (ft)	213	25	33	216	6	224
Queue Length 95th (ft)	#391	58	#106	281	20	291
Internal Link Dist (ft)	600	153		628		434
Turn Bay Length (ft)			110		65	
Base Capacity (vph)	527	518	173	1874	186	1874
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.17	0.52	0.57	0.11	0.59

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: MLK Way & 53rd Street

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	80	50	20	2112	20	1636
v/c Ratio	0.25	0.19	0.17	0.58	0.16	0.44
Control Delay	12.0	26.5	64.8	3.6	35.2	5.5
Queue Delay	0.0	0.0	0.0	0.5	0.0	0.0
Total Delay	12.0	26.5	64.8	4.1	35.2	5.5
Queue Length 50th (ft)	12	25	13	10	14	4
Queue Length 95th (ft)	41	m43	m19	#88	m20	454
Internal Link Dist (ft)	491	487		57		219
Turn Bay Length (ft)			120		120	
Base Capacity (vph)	565	498	141	3626	169	3714
Starvation Cap Reductn	0	0	0	895	0	0
Spillback Cap Reductn	3	0	0	0	0	353
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.10	0.14	0.77	0.12	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

10: MLK Way & 52nd Street

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	71	230	266	227	140	1863	154	1572
v/c Ratio	0.31	0.46	0.95	0.38	0.65	0.90	0.49	0.67
Control Delay	31.1	26.6	82.9	13.6	45.6	33.1	26.3	8.4
Queue Delay	0.0	0.5	62.3	11.1	0.0	0.4	5.5	0.4
Total Delay	31.1	27.2	145.3	24.6	45.6	33.5	31.8	8.8
Queue Length 50th (ft)	34	95	182	19	85	429	103	365
Queue Length 95th (ft)	73	164	#316	111	m87	m423	129	26
Internal Link Dist (ft)		152	97			124		74
Turn Bay Length (ft)					120		120	
Base Capacity (vph)	252	550	308	629	294	2073	312	2349
Starvation Cap Reductn	0	0	170	368	0	0	0	297
Spillback Cap Reductn	0	100	0	1	0	33	105	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.51	1.93	0.87	0.48	0.91	0.74	0.77

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

11: 52nd Street & Garage

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	393	417	20	63
v/c Ratio	0.50	0.53	0.03	0.08
Control Delay	13.5	13.8	6.4	3.2
Queue Delay	7.3	2.9	0.0	0.0
Total Delay	20.7	16.7	6.4	3.3
Queue Length 50th (ft)	70	85	2	1
Queue Length 95th (ft)	m99	151	10	15
Internal Link Dist (ft)	97	24	15	55
Turn Bay Length (ft)				
Base Capacity (vph)	780	793	620	786
Starvation Cap Reductn	335	0	0	0
Spillback Cap Reductn	0	265	155	198
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.88	0.79	0.04	0.11

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

14: 52nd Street & Shattuck Ave

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	373	1128	60	1040	160	300	300	361
v/c Ratio	0.69	0.45	0.58	0.86	0.66	0.51	1.01	0.59
Control Delay	41.2	17.9	72.6	47.8	41.8	31.9	96.4	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.2	17.9	72.6	47.8	41.8	31.9	96.4	7.9
Queue Length 50th (ft)	231	179	42	252	81	162	~214	0
Queue Length 95th (ft)	340	218	#98	#309	#141	248	#394	80
Internal Link Dist (ft)		112		107		500	112	
Turn Bay Length (ft)			145		100			
Base Capacity (vph)	544	2495	106	1205	243	593	298	616
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.45	0.57	0.86	0.66	0.51	1.01	0.59

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

15: Telegraph Ave & 52nd Street/Claremont Ave

Lane Group	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	60	126	274	1266	140	1027
v/c Ratio	0.43	0.41	0.79	0.76	0.67	0.52
Control Delay	62.7	39.1	42.6	17.3	57.8	11.6
Queue Delay	3.6	0.9	9.4	2.4	0.0	0.1
Total Delay	66.4	40.0	52.0	19.8	57.8	11.7
Queue Length 50th (ft)	23	72	115	319	85	180
Queue Length 95th (ft)	m27	127	209	m#509	148	252
Internal Link Dist (ft)	229		175	169		628
Turn Bay Length (ft)					80	
Base Capacity (vph)	158	382	409	1658	238	1983
Starvation Cap Reductn	0	0	0	261	0	0
Spillback Cap Reductn	48	106	103	0	0	135
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.46	0.90	0.91	0.59	0.56

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

16: Telegraph Ave & 51St Street

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	336	772	70	761	103	810	280	601
v/c Ratio	0.68	0.77	0.43	0.96	0.73	0.72	1.23	0.45
Control Delay	47.4	38.1	50.5	58.7	76.2	32.9	178.2	16.3
Queue Delay	0.0	0.0	0.0	0.7	0.0	52.0	0.6	1.2
Total Delay	47.4	38.1	50.5	59.4	76.2	84.9	178.8	17.5
Queue Length 50th (ft)	105	236	43	233	66	231	~228	87
Queue Length 95th (ft)	148	#321	85	#355	#175	312	#395	111
Internal Link Dist (ft)		265		250		396		169
Turn Bay Length (ft)	145		150		100			
Base Capacity (vph)	578	1007	214	795	141	1128	227	1341
Starvation Cap Reductn	0	0	0	0	0	0	9	494
Spillback Cap Reductn	0	0	0	4	0	513	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.77	0.33	0.96	0.73	1.32	1.28	0.71

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	WBR	SBT	SBR
Lane Group Flow (vph)	301	1682	1662	243
v/c Ratio	0.35	1.03	0.80	0.09
Control Delay	16.5	37.0	26.2	0.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	16.5	37.0	26.2	0.0
Queue Length 50th (ft)	36	~35	541	0
Queue Length 95th (ft)	63	#257	616	m0
Internal Link Dist (ft)			344	
Turn Bay Length (ft)				
Base Capacity (vph)	850	1627	2072	2814
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.35	1.03	0.80	0.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Appendix N

Collisions Analysis Summary

FEHR PEERS

Appendix N
Collision Analysis Summary (2008-2012)

Location	Vehicle/Vehicle [1]			Vehicle/Bicycle			Vehicle/Pedestrian			Total
	Total	Injured[2]	Killed	Total	Injured	Killed	Total	Injured	Killed	
51st St										
51st (West St to MLK Jr. Way)	0	0	0	0	0	0	0	0	0	0
52nd St										
52nd (Genoa St to West St)	6	2	0	0	0	0	1	1	0	7
52nd/West	0	0	0	1	0	0	0	0	0	1
52nd (West St to MLK Jr. Way)	3	0	0	0	0	0	0	0	0	3
52nd (MLK Jr. Way to Dover St)	5	0	0	0	0	0	0	0	0	5
52nd/Dover St	0	0	0	1	1	0	0	0	0	1
52nd (Dover St to Rt. 24)	1	1	0	0	0	0	0	0	0	1
52nd/Rt. 24	1	1	0	1	1	0	0	0	0	2
52nd (Rt. 24 to Shattuck Ave)	5	1	0	0	0	0	0	0	0	5
52nd/Shattuck	13	5	0	4	4	0	0	0	0	17
East of Shattuck	4	1	0	0	0	0	0	0	0	4
53rd St										
53rd/Genoa	2	0	0	0	0	0	0	0	0	2
53rd (Genoa to MLK Jr. Way)	0	0	0	0	0	0	0	0	0	0
53rd (MLK Jr. Way to Dover St)	1	0	0	0	0	0	0	0	0	1
53rd/Dover St	0	0	0	0	0	0	0	0	0	0
53rd (Dover St to dead end)	1	0	0	0	0	0	0	0	0	1
54th St										
54th (Genoa St to MLK Jr. Way)	0	0	0	0	0	0	0	0	0	0
54th (MLK Jr. Way to Dover St)	1	0	0	0	0	0	0	0	0	1
54th/Dover St	0	0	0	0	0	0	0	0	0	0
54th (Dover St to Rt. 24)	0	0	0	0	0	0	0	0	0	0
Dover St										
Dover (55th to 54th)	1	0	0	0	0	0	0	0	0	1
Dover (54th to 53rd)	0	0	0	1	1	0	0	0	0	1
Dover (53rd to 52nd)	0	0	0	0	0	0	0	0	0	0
West St										
West (MLK Jr. Way to 52nd St)	1	1	0	0	0	0	0	0	0	1
West (52nd St to 51st St)	2	0	0	0	0	0	0	0	0	2
West (51st St to 47th St)	2	0	0	0	0	0	0	0	0	2
West/47th	0	0	0	0	0	0	0	0	0	0
MLK Jr. Way										
MLK Jr./55th St	20	13	0	2	2	0	2	2	0	24
MLK Jr. (55th St to 54th St)	7	2	0	0	0	0	0	0	0	7
MLK Jr./54th	4	3	0	1	1	0	0	0	0	5
MLK Jr. (54th St to 53rd St)	3	0	0	0	0	0	0	0	0	3
MLK Jr./53rd St	5	4	0	2	1	0	0	0	0	7
MLK Jr. (53rd St to West St)	1	1	0	0	0	0	0	0	0	1
MLK Jr./West	0	0	0	0	0	0	0	0	0	0
MLK Jr. (West to 52nd St)	6	2	0	0	0	0	0	0	0	6
MLK Jr./52nd	31	34	0	1	1	0	1	1	0	33
MLK Jr (52nd to 51st)	18	4	0	1	0	0	1	1	0	20
MLK Jr./51st	3	0	0	0	0	0	0	0	0	3
MLK Jr. (51st to 47th)	8	6	0	0	0	0	1	1	0	9
MLK Jr./47th	3	3	0	0	0	0	0	0	0	3
MLK Jr. (47th to Rt. 24)	1	2	0	0	0	0	0	0	0	1

1. Vehicle/Vehicle collisions also include single vehicle collisions hitting fixed objects or parked vehicles.
2. Total number of injured persons.
Source: Statewide Integrated Traffic Records System, summarized by Fehr & Peers, 2014.

Appendix O

LOS Calculation Worksheets – Dover Street Closure Conditions

FEHR PEERS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	13	170	219	54	217	57	14	127	1341	61	52	1241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.93			0.98			1.00	0.99		1.00	1.00
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1707			1759			1770	5038		1770	5064
Flt Permitted		0.98			0.77			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1683			1364			1770	5038		1770	5064
Peak-hour factor, PHF	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. Flow (vph)	13	170	219	54	217	57	14	127	1341	61	52	1241
RTOR Reduction (vph)	0	56	0	0	10	0	0	0	4	0	0	2
Lane Group Flow (vph)	0	346	0	0	318	0	0	141	1398	0	52	1266
Confl. Peds. (#/hr)	7		14	14		7				21		
Confl. Bikes (#/hr)			16			15				6		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		25.9			25.9			15.3	45.1		4.5	34.3
Effective Green, g (s)		25.9			25.9			15.3	45.1		4.5	34.3
Actuated g/C Ratio		0.29			0.29			0.17	0.50		0.05	0.38
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		484			392			300	2524		88	1929
v/s Ratio Prot								0.08	c0.28		0.03	c0.25
v/s Ratio Perm		0.21			c0.23							
v/c Ratio		0.72			0.81			0.47	0.55		0.59	0.66
Uniform Delay, d1		28.7			29.8			33.7	15.5		41.8	23.0
Progression Factor		1.00			1.00			0.52	0.11		1.00	1.00
Incremental Delay, d2		5.0			12.0			1.1	0.8		10.2	1.8
Delay (s)		33.7			41.8			18.7	2.6		52.0	24.7
Level of Service		C			D			B	A		D	C
Approach Delay (s)		33.7			41.8				4.1			25.8
Approach LOS		C			D				A			C

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	27
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	27
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	12
Confl. Bikes (#/hr)	7
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis
2: Dover Street & 55th Street

Children's Hospital
DC_Existing AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	261	6	20	296	6	7	8	11	8	6	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	18	261	6	20	296	6	7	8	11	8	6	21
Pedestrians		9			20			15			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked	0.91						0.91	0.91		0.91	0.91	0.91
vC, conflicting volume	308			282			687	663	299	680	663	314
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	185			282			603	577	299	596	577	192
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			98	98	98	98	98	97
cM capacity (veh/h)	1237			1253			340	372	724	343	368	758

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	285	322	26	35
Volume Left	18	20	7	8
Volume Right	6	6	11	21
cSH	1237	1253	454	520
Volume to Capacity	0.01	0.02	0.06	0.07
Queue Length 95th (ft)	1	1	5	5
Control Delay (s)	0.6	0.6	13.4	12.4
Lane LOS	A	A	B	B
Approach Delay (s)	0.6	0.6	13.4	12.4
Approach LOS			B	B

Intersection Summary				
Average Delay			1.7	
Intersection Capacity Utilization			36.8%	ICU Level of Service
Analysis Period (min)			15	

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
DC_Existing AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	199	40	25	250	31	28	430	24	25	544	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.99			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.99			0.99			0.99	
Flt Protected		0.99			1.00			1.00			1.00	
Satd. Flow (prot)		1743			1803			1841			1861	
Flt Permitted		0.90			0.96			0.95			0.97	
Satd. Flow (perm)		1582			1743			1759			1813	
Peak-hour factor, PHF	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. Flow (vph)	50	199	40	25	250	31	28	430	24	25	544	28
RTOR Reduction (vph)	0	8	0	0	5	0	0	2	0	0	2	0
Lane Group Flow (vph)	0	281	0	0	301	0	0	480	0	0	595	0
Confl. Peds. (#/hr)	6		13	13		6	7		17	17		7
Confl. Bikes (#/hr)			22			10			13			24
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		25.0			25.0			47.0			47.0	
Effective Green, g (s)		25.0			25.0			47.0			47.0	
Actuated g/C Ratio		0.31			0.31			0.59			0.59	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		494			544			1033			1065	
v/s Ratio Prot												
v/s Ratio Perm		c0.18			0.17			0.27			c0.33	
v/c Ratio		0.57			0.55			0.46			0.56	
Uniform Delay, d1		23.0			22.9			9.4			10.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		4.7			4.0			1.5			2.1	
Delay (s)		27.7			26.9			10.9			12.2	
Level of Service		C			C			B			B	
Approach Delay (s)		27.7			26.9			10.9			12.2	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM 2000 Control Delay		17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio		0.56		
Actuated Cycle Length (s)		80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization		73.9%	ICU Level of Service	D
Analysis Period (min)		15		
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
DC_Existing AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	148	14	77	32	10	9	58	707	40	27	810	236
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		0.99	1.00	
Frt		0.96			0.98		1.00	0.99		1.00	0.97	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1654			1713		1761	3496		1768	3406	
Flt Permitted		0.78			0.79		0.23	1.00		0.35	1.00	
Satd. Flow (perm)		1332			1404		429	3496		643	3406	
Peak-hour factor, PHF	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. Flow (vph)	148	14	77	32	10	9	58	707	40	27	810	236
RTOR Reduction (vph)	0	29	0	0	7	0	0	4	0	0	29	0
Lane Group Flow (vph)	0	210	0	0	44	0	58	743	0	27	1017	0
Confl. Peds. (#/hr)	6		11	11		6	13		17	17		13
Confl. Bikes (#/hr)			15			15			43			27
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		16.8			16.8		44.2	44.2		44.2	44.2	
Effective Green, g (s)		16.8			16.8		44.2	44.2		44.2	44.2	
Actuated g/C Ratio		0.24			0.24		0.63	0.63		0.63	0.63	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		319			336		270	2207		406	2150	
v/s Ratio Prot								0.21			c0.30	
v/s Ratio Perm		c0.16			0.03		0.14			0.04		
v/c Ratio		0.66			0.13		0.21	0.34		0.07	0.47	
Uniform Delay, d1		24.0			20.9		5.5	6.0		5.0	6.8	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.9			0.2		1.8	0.4		0.3	0.7	
Delay (s)		28.9			21.1		7.3	6.5		5.3	7.5	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		28.9			21.1			6.5			7.5	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	62.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
5: MLK Way & 54th Street

Children's Hospital
DC_Existing AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	4	3	43	5	3	8	11	15	1517	16	5	1488
Sign Control		Stop			Stop				Free			Free
Grade		0%			0%				0%			0%
Peak Hour 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
Hourly flow rate (vph)	4	3	43	5	3	8	0	15	1517	16	5	1488
Pedestrians		7			6				8			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		1			1				1			
Right turn flare (veh)												
Median type									None			None
Median storage veh)												
Upstream signal (ft)									299			294
pX, platoon unblocked	0.88	0.88	0.80	0.88	0.88	0.84	0.00	0.80			0.84	
vC, conflicting volume	2054	3078	514	2120	3073	520	0	1502			1539	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	512	1679	0	587	1674	0	0	749			992	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			4.1	
tC, 2 stage (s)												
tF (s)	*5.0	*5.0	*5.0	*5.0	*5.0	*5.0	0.0	2.2			2.2	
p0 queue free %	99	96	92	98	96	99	0	98			99	
cM capacity (veh/h)	280	75	568	233	76	605	0	680			587	

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	50	16	394	758	395	377	744	379
Volume Left	4	5	15	0	0	5	0	0
Volume Right	43	8	0	0	16	0	0	7
cSH	386	216	680	1700	1700	587	1700	1700
Volume to Capacity	0.13	0.07	0.02	0.45	0.23	0.01	0.44	0.22
Queue Length 95th (ft)	11	6	2	0	0	1	0	0
Control Delay (s)	15.7	23.0	0.7	0.0	0.0	0.3	0.0	0.0
Lane LOS	C	C	A			A		
Approach Delay (s)	15.7	23.0	0.2			0.1		
Approach LOS	C	C						

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	60.8%	ICU Level of Service	B	
Analysis Period (min)	15			

* User Entered Value

Movement	SBR
Lane Configurations	
Volume (veh/h)	7
Sign Control	
Grade	
Peak Hour Factor	1.00
Hourly flow rate (vph)	7
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	
tC, single (s)	
tC, 2 stage (s)	
tF (s)	
p0 queue free %	
cM capacity (veh/h)	

Direction, Lane #	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	11	6	4	6	9	8	17	11	4	33	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	5	11	6	4	6	9	8	17	11	4	33	5
Pedestrians		10			14			2			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	110	112	48	110	108	42	48			42		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	110	112	48	110	108	42	48			42		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	99	100	99	99	99			100		
cM capacity (veh/h)	831	761	1017	830	764	1017	1559			1562		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	22	19	36	42
Volume Left	5	4	8	4
Volume Right	6	9	11	5
cSH	834	883	1559	1562
Volume to Capacity	0.03	0.02	0.01	0.00
Queue Length 95th (ft)	2	2	0	0
Control Delay (s)	9.4	9.2	1.7	0.7
Lane LOS	A	A	A	A
Approach Delay (s)	9.4	9.2	1.7	0.7
Approach LOS	A	A		

Intersection Summary				
Average Delay	4.0			
Intersection Capacity Utilization	19.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	20	12	487	587	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	20	12	487	587	5
Pedestrians	9			2	1	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.81	0.81	0.81			
vC, conflicting volume	1110	600	601			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1005	386	387			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	96	99			
cM capacity (veh/h)	214	533	939			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	21	499	592
Volume Left	1	12	0
Volume Right	20	0	5
cSH	498	939	1700
Volume to Capacity	0.04	0.01	0.35
Queue Length 95th (ft)	3	1	0
Control Delay (s)	12.6	0.4	0.0
Lane LOS	B	A	
Approach Delay (s)	12.6	0.4	0.0
Approach LOS	B		

Intersection Summary				
Average Delay		0.4		
Intersection Capacity Utilization		45.9%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	0	38	42	4	10	21	1555	62	2	1563	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.98			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Frt		0.88			0.98		1.00	0.99		1.00	1.00	
Flt Protected		1.00			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1596			1771		1770	5045		1787	5132	
Flt Permitted		0.98			0.78		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1571			1430		1770	5045		1787	5132	
Peak-hour factor, PHF	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. Flow (vph)	4	0	38	42	4	10	21	1555	62	2	1563	5
RTOR Reduction (vph)	0	34	0	0	8	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	8	0	0	48	0	21	1614	0	2	1568	0
Confl. Peds. (#/hr)	7		13	13		7			13			20
Confl. Bikes (#/hr)									5			13
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		16.2			16.2		3.0	59.5		1.8	58.3	
Effective Green, g (s)		16.2			16.2		3.0	59.5		1.8	58.3	
Actuated g/C Ratio		0.18			0.18		0.03	0.66		0.02	0.65	
Clearance Time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		282			257		59	3335		35	3324	
v/s Ratio Prot							0.01	c0.32		0.00	c0.31	
v/s Ratio Perm		0.00			c0.03							
v/c Ratio		0.03			0.19		0.36	0.48		0.06	0.47	
Uniform Delay, d1		30.4			31.3		42.6	7.6		43.3	8.0	
Progression Factor		1.00			1.01		1.17	0.52		0.50	0.22	
Incremental Delay, d2		0.0			0.4		3.0	0.4		0.6	0.4	
Delay (s)		30.4			32.1		52.8	4.3		22.4	2.2	
Level of Service		C			C		D	A		C	A	
Approach Delay (s)		30.4			32.1			5.0			2.2	
Approach LOS		C			C			A			A	

Intersection Summary					
HCM 2000 Control Delay		4.4	HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio		0.44			
Actuated Cycle Length (s)		90.0	Sum of lost time (s)		12.5
Intersection Capacity Utilization		53.8%	ICU Level of Service		A
Analysis Period (min)		15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	32	13	0	0	6	6	0	0	0	2	0	44
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	32	13	0	0	6	6	0	0	0	2	0	44
Pedestrians		22			21			2			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			2			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	59	69	46	56	91	23	66			21		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	59	69	46	56	91	23	66			21		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	98	100	100	99	99	100			100		
cM capacity (veh/h)	887	795	1009	892	773	1039	1520			1580		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	45	12	0	46
Volume Left	32	0	0	2
Volume Right	0	6	0	44
cSH	858	887	1700	1580
Volume to Capacity	0.05	0.01	0.00	0.00
Queue Length 95th (ft)	4	1	0	0
Control Delay (s)	9.4	9.1	0.0	0.3
Lane LOS	A	A		A
Approach Delay (s)	9.4	9.1	0.0	0.3
Approach LOS	A	A		

Intersection Summary				
Average Delay			5.3	
Intersection Capacity Utilization			25.3%	ICU Level of Service
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	45	70	100	58	74	247	50	56	1494	34	28	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.97			1.00	0.97		1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00			0.99	1.00		1.00	1.00			1.00
Frt	1.00	0.91			1.00	0.85		1.00	1.00			1.00
Flt Protected	0.95	1.00			0.98	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1774	1656			1797	1544		1787	5116			1787
Flt Permitted	0.66	1.00			0.80	1.00		0.95	1.00			0.95
Satd. Flow (perm)	1234	1656			1475	1544		1787	5116			1787
Peak-hour factor, PHF	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. Flow (vph)	45	70	100	58	74	247	50	56	1494	34	28	116
RTOR Reduction (vph)	0	66	0	0	0	187	0	0	2	0	0	0
Lane Group Flow (vph)	45	104	0	0	132	60	0	106	1526	0	0	144
Confl. Peds. (#/hr)	10		49	49		10				7		
Confl. Bikes (#/hr)			6			5				1		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	22.0	22.0			22.0	22.0		7.2	42.0			12.5
Effective Green, g (s)	22.0	22.0			22.0	22.0		7.2	42.0			12.5
Actuated g/C Ratio	0.24	0.24			0.24	0.24		0.08	0.47			0.14
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	301	404			360	377		142	2387			248
v/s Ratio Prot		0.06						0.06	c0.30			0.08
v/s Ratio Perm	0.04				c0.09	0.04						
v/c Ratio	0.15	0.26			0.37	0.16		0.75	0.64			0.58
Uniform Delay, d1	26.7	27.4			28.2	26.7		40.5	18.2			36.3
Progression Factor	1.00	1.00			1.00	1.00		0.99	1.06			0.78
Incremental Delay, d2	0.1	0.1			0.2	0.1		8.6	0.6			2.1
Delay (s)	26.7	27.5			28.4	26.8		48.9	20.0			30.3
Level of Service	C	C			C	C		D	B			C
Approach Delay (s)		27.4			27.4				21.8			
Approach LOS		C			C				C			

Intersection Summary				
HCM 2000 Control Delay		19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio		0.57		
Actuated Cycle Length (s)		90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization		95.2%	ICU Level of Service	F
Analysis Period (min)		15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1483	6
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5131	
Flt Permitted	1.00	
Satd. Flow (perm)	5131	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1483	6
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1489	0
Confl. Peds. (#/hr)		10
Confl. Bikes (#/hr)		10
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	46.8	
Effective Green, g (s)	46.8	
Actuated g/C Ratio	0.52	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2668	
v/s Ratio Prot	c0.29	
v/s Ratio Perm		
v/c Ratio	0.56	
Uniform Delay, d1	14.6	
Progression Factor	0.76	
Incremental Delay, d2	0.8	
Delay (s)	11.9	
Level of Service	B	
Approach Delay (s)	13.5	
Approach LOS	B	

Intersection Summary			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	211	9	5	351	2	15	7	10	0	2	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.96			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			1.00			0.96			0.88	
Flt Protected		1.00			1.00			0.98			1.00	
Satd. Flow (prot)		3497			3600			1465			1655	
Flt Permitted		0.95			0.95			0.94			1.00	
Satd. Flow (perm)		3338			3428			1404			1655	
Peak-hour factor, PHF	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. Flow (vph)	4	211	9	5	351	2	15	7	10	0	2	15
RTOR Reduction (vph)	0	5	0	0	1	0	0	5	0	0	8	0
Lane Group Flow (vph)	0	219	0	0	357	0	0	27	0	0	9	0
Confl. Peds. (#/hr)	17		55	55		17			202	202		
Confl. Bikes (#/hr)			6			5						1
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Prot	NA		Perm	NA		Perm	NA			NA	
Protected Phases	5	2			6			4			8	
Permitted Phases				6			4			8		
Actuated Green, G (s)		21.0			14.0			23.0			23.0	
Effective Green, g (s)		21.0			14.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.28			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1414			959			645			761	
v/s Ratio Prot		c0.01									0.01	
v/s Ratio Perm		0.05			c0.10			c0.02				
v/c Ratio		0.15			0.37			0.04			0.01	
Uniform Delay, d1		9.0			14.5			7.4			7.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			1.1			0.1			0.0	
Delay (s)		9.2			15.6			7.6			7.4	
Level of Service		A			B			A			A	
Approach Delay (s)		9.2			15.6			7.6			7.4	
Approach LOS		A			B			A			A	

Intersection Summary					
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.17				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	9.0		
Intersection Capacity Utilization	39.1%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
12: 52nd Street & Dover Street

Children's Hospital
DC_Existing AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	12	211	3	11	351	5	3	0	7	2	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	12	211	3	11	351	5	3	0	7	2	0	6
Pedestrians		20			10			12			23	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			1			1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.91			0.94			0.94	0.94	0.94	0.94	0.94	0.91
vC, conflicting volume	379			226			650	650	234	652	648	396
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	267			150			457	457	159	459	456	286
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	99			99			99	100	99	100	100	99
cM capacity (veh/h)	1151			1343			436	436	802	449	450	664

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	226	367	10	8
Volume Left	12	11	3	2
Volume Right	3	5	7	6
cSH	1151	1343	641	593
Volume to Capacity	0.01	0.01	0.02	0.01
Queue Length 95th (ft)	1	1	1	1
Control Delay (s)	0.5	0.3	10.7	11.2
Lane LOS	A	A	B	B
Approach Delay (s)	0.5	0.3	10.7	11.2
Approach LOS			B	B

Intersection Summary					
Average Delay			0.7		
Intersection Capacity Utilization			37.2%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis
13: SR-24 NB Off-Ramp & 52nd Street

Children's Hospital
DC_Existing AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	218	0	0	371	1077	0	898	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	218	0	0	371	1077	0	898	0	0
Pedestrians							24			
Lane Width (ft)							12.0			
Walking Speed (ft/s)							4.0			
Percent Blockage							2			
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.83						0.83		0.83	0.83
vC, conflicting volume	1448			242			1690	133	1378	613
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1133			242			1424	133	1049	129
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	509			1295			110	871	0	620

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	109	109	247	483	718	449	449
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	359	718	449	449
cSH	1700	1700	1700	1700	1700	871	871
Volume to Capacity	0.06	0.06	0.15	0.28	0.42	0.52	0.52
Queue Length 95th (ft)	0	0	0	0	0	76	76
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	13.5	13.5
Lane LOS						B	B
Approach Delay (s)	0.0		0.0			13.5	
Approach LOS						B	

Intersection Summary					
Average Delay			4.7		
Intersection Capacity Utilization			48.1%	ICU Level of Service	A
Analysis Period (min)			15		

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	40	285	678	148	24	871	82	154	123	30	101	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.99		1.00	1.00		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.97		1.00	0.99		1.00	0.97			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.98
Satd. Flow (prot)		1787	4943		1805	5105		1752	1781			1733
Flt Permitted		0.95	1.00		0.95	1.00		0.43	1.00			0.79
Satd. Flow (perm)		1787	4943		1805	5105		796	1781			1401
Peak-hour factor, PHF	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. Flow (vph)	40	285	678	148	24	871	82	154	123	30	101	136
RTOR Reduction (vph)	0	0	31	0	0	12	0	0	10	0	0	0
Lane Group Flow (vph)	0	325	795	0	24	941	0	154	143	0	0	237
Confl. Peds. (#/hr)				12			5			10	10	
Confl. Bikes (#/hr)				12			1			10		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		21.5	37.7		3.2	19.4		35.1	35.1			24.6
Effective Green, g (s)		21.5	37.7		3.2	19.4		35.1	35.1			24.6
Actuated g/C Ratio		0.24	0.42		0.04	0.22		0.39	0.39			0.27
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		426	2070		64	1100		379	694			382
v/s Ratio Prot		c0.18	0.16		0.01	c0.18		c0.03	0.08			
v/s Ratio Perm								0.13				c0.17
v/c Ratio		0.76	0.38		0.38	0.86		0.41	0.21			0.62
Uniform Delay, d1		31.9	18.1		42.4	34.0		18.8	18.2			28.6
Progression Factor		1.00	1.00		1.22	0.83		1.00	1.00			1.00
Incremental Delay, d2		12.2	0.5		3.0	7.2		0.7	0.7			7.4
Delay (s)		44.1	18.6		54.7	35.5		19.5	18.9			36.0
Level of Service		D	B		D	D		B	B			D
Approach Delay (s)			25.8			36.0			19.2			30.7
Approach LOS			C			D			B			C

Intersection Summary			
HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	100.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: 52nd Street & Shattuck Ave

Children's Hospital
DC_Existing AM Plus Phase 1

Movement	SBR
Lane Configurations	
Volume (vph)	377
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.94
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1419
Flt Permitted	1.00
Satd. Flow (perm)	1419
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	377
RTOR Reduction (vph)	274
Lane Group Flow (vph)	103
Confl. Peds. (#/hr)	16
Confl. Bikes (#/hr)	41
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	24.6
Effective Green, g (s)	24.6
Actuated g/C Ratio	0.27
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	387
v/s Ratio Prot	
v/s Ratio Perm	0.07
v/c Ratio	0.27
Uniform Delay, d1	25.6
Progression Factor	1.00
Incremental Delay, d2	1.7
Delay (s)	27.3
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
15: Telegraph Ave & 52nd Street/Claremont Ave

Children's Hospital
DC_Existing AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	0	6	94	52	154	0	657	117	64	598	273
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.98		1.00	0.99			0.99		1.00	0.97	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.93		1.00	0.89			0.98		1.00	0.95	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1576		1698	1569			3852		1770	3280	
Flt Permitted		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (perm)		1576		1698	1569			3852		1770	3280	
Peak-hour factor, PHF	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. Flow (vph)	6	0	6	94	52	154	0	657	117	64	598	273
RTOR Reduction (vph)	0	12	0	0	119	0	0	11	0	0	37	0
Lane Group Flow (vph)	0	0	0	85	96	0	0	763	0	64	834	0
Confl. Peds. (#/hr)	4					4	22		18			22
Confl. Bikes (#/hr)			1			2			33			27
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA			NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		1.1		15.4	15.4			48.2		7.3	60.0	
Effective Green, g (s)		1.1		15.4	15.4			48.2		7.3	60.0	
Actuated g/C Ratio		0.01		0.17	0.17			0.54		0.08	0.67	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		19		290	268			2062		143	2186	
v/s Ratio Prot		c0.00		0.05	c0.06			0.20		0.04	c0.25	
v/s Ratio Perm												
v/c Ratio		0.01		0.29	0.36			0.37		0.45	0.38	
Uniform Delay, d1		43.9		32.6	32.9			12.1		39.4	6.7	
Progression Factor		1.00		1.00	1.00			0.95		1.00	1.00	
Incremental Delay, d2		0.1		0.6	0.8			0.4		2.2	0.5	
Delay (s)		44.0		33.1	33.8			11.9		41.7	7.2	
Level of Service		D		C	C			B		D	A	
Approach Delay (s)		44.0			33.6			11.9			9.6	
Approach LOS		D			C			B			A	

Intersection Summary				
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.39			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	70.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
16: Telegraph Ave & 51St Street

Children's Hospital
DC_Existing AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	220	488	68	101	530	238	91	320	58	147	511	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.98		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3417		1787	3349		1719	3324		1752	3447	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3417		1787	3349		1719	3324		1752	3447	
Peak-hour factor, PHF	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. Flow (vph)	220	488	68	101	530	238	91	320	58	147	511	38
RTOR Reduction (vph)	0	12	0	0	56	0	0	16	0	0	5	0
Lane Group Flow (vph)	220	544	0	101	712	0	91	362	0	147	544	0
Confl. Peds. (#/hr)			31			31			30			37
Confl. Bikes (#/hr)			9			7			27			27
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.0	29.0		8.6	27.1		8.4	24.9		11.0	28.5	
Effective Green, g (s)	11.0	29.0		8.6	27.1		8.4	24.9		11.0	28.5	
Actuated g/C Ratio	0.12	0.32		0.10	0.30		0.09	0.28		0.12	0.32	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	415	1101		170	1008		160	919		214	1091	
v/s Ratio Prot	c0.06	0.16		0.06	c0.21		0.05	0.11		c0.08	c0.16	
v/s Ratio Perm												
v/c Ratio	0.53	0.49		0.59	0.71		0.57	0.39		0.69	0.50	
Uniform Delay, d1	37.1	24.6		39.0	27.9		39.1	26.4		37.8	24.9	
Progression Factor	1.28	0.79		1.00	1.00		1.00	1.00		1.01	0.86	
Incremental Delay, d2	1.2	1.5		5.5	4.2		4.6	1.3		8.5	1.6	
Delay (s)	48.5	20.8		44.5	32.1		43.6	27.7		46.7	23.1	
Level of Service	D	C		D	C		D	C		D	C	
Approach Delay (s)		28.7			33.5			30.8			28.1	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	69.6%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	149	0	0	0	0	1506	0	0	0	0	1418	234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	149	0	0	0	0	1506	0	0	0	0	1418	234
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	149	0	0	0	0	1506	0	0	0	0	1418	234
Confl. Bikes (#/hr)		2										
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	8.0					45.0					29.0	45.0
Effective Green, g (s)	8.0					45.0					29.0	45.0
Actuated g/C Ratio	0.18					1.00					0.64	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	581					1627					2303	2814
v/s Ratio Prot	0.05										0.40	0.08
v/s Ratio Perm						c0.93						
v/c Ratio	0.26					0.93					0.62	0.08
Uniform Delay, d1	15.9					0.0					4.7	0.0
Progression Factor	1.00					1.00					1.77	1.00
Incremental Delay, d2	1.1					10.5					1.1	0.0
Delay (s)	17.0					10.5					9.4	0.0
Level of Service	B					B					A	A
Approach Delay (s)		17.0			10.5			0.0			8.1	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	1.13			
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	50.1%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	159	10	57	72	0	22	0	71	2	43	5
Peak Hour 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
Hourly flow rate (vph)	0	159	10	57	72	0	22	0	71	2	43	5

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	169	129	22	71	50
Volume Left (vph)	0	57	22	0	2
Volume Right (vph)	10	0	0	71	5
Hadj (s)	-0.02	0.12	0.50	-0.70	-0.02
Departure Headway (s)	4.4	4.6	5.7	4.5	4.8
Degree Utilization, x	0.21	0.16	0.04	0.09	0.07
Capacity (veh/h)	792	751	591	739	693
Control Delay (s)	8.5	8.4	7.8	6.8	8.1
Approach Delay (s)	8.5	8.4	7.0		8.1
Approach LOS	A	A	A		A

Intersection Summary				
Delay	8.1			
Level of Service	A			
Intersection Capacity Utilization	36.2%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	5	144	1	4	77	20	1	0	3	15	0	3
Peak Hour 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
Hourly flow rate (vph)	5	144	1	4	77	20	1	0	3	15	0	3

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	150	101	4	18
Volume Left (vph)	5	4	1	15
Volume Right (vph)	1	20	3	3
Hadj (s)	0.02	-0.11	-0.40	0.07
Departure Headway (s)	4.1	4.0	4.1	4.5
Degree Utilization, x	0.17	0.11	0.00	0.02
Capacity (veh/h)	872	890	827	744
Control Delay (s)	7.9	7.5	7.1	7.6
Approach Delay (s)	7.9	7.5	7.1	7.6
Approach LOS	A	A	A	A

Intersection Summary				
Delay			7.7	
Level of Service			A	
Intersection Capacity Utilization			21.4%	ICU Level of Service
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	354	0	4	312	10	6	11	14	32	12	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	2	354	0	4	312	10	6	11	14	32	12	8
Pedestrians		8			2			10			11	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	333			364			715	709	366	716	704	336
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	333			364			715	709	366	716	704	336
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	97	98	90	97	99
cM capacity (veh/h)	1221			1196			325	353	677	321	353	695

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	356	326	31	52
Volume Left	2	4	6	32
Volume Right	0	10	14	8
cSH	1221	1196	441	358
Volume to Capacity	0.00	0.00	0.07	0.15
Queue Length 95th (ft)	0	0	6	13
Control Delay (s)	0.1	0.1	13.8	16.7
Lane LOS	A	A	B	C
Approach Delay (s)	0.1	0.1	13.8	16.7
Approach LOS			B	C

Intersection Summary				
Average Delay			1.8	
Intersection Capacity Utilization			35.4%	ICU Level of Service
Analysis Period (min)			15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	34	1613	201	0	1643
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	34	1613	201	0	1643
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			154			137
pX, platoon unblocked	0.85	0.77			0.77	
vC, conflicting volume	2261	638			1814	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	641	0			1030	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	347	839			519	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	34	645	645	524	548	548	548
Volume Left	0	0	0	0	0	0	0
Volume Right	34	0	0	201	0	0	0
cSH	839	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.04	0.38	0.38	0.31	0.32	0.32	0.32
Queue Length 95th (ft)	3	0	0	0	0	0	0
Control Delay (s)	9.5	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	9.5	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	45.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	1	1630	25	0	1691
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	1	1630	25	0	1691
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			424			204
pX, platoon unblocked	0.80					
vC, conflicting volume	2206	556			1655	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1647	556			1655	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	72	475			386	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	1	652	652	351	564	564	564
Volume Left	0	0	0	0	0	0	0
Volume Right	1	0	0	25	0	0	0
cSH	475	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.38	0.38	0.21	0.33	0.33	0.33
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	12.6	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	12.6	0.0			0.0		
Approach LOS	B						

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	42.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	12	247	161	49	137	42	22	198	1580	143	86	1295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.99			0.99			1.00	0.99		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.95			0.98			1.00	0.99		1.00	1.00
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1756			1751			1770	4991		1770	5074
Flt Permitted		0.99			0.70			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1739			1233			1770	4991		1770	5074
Peak-hour factor, PHF	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. Flow (vph)	12	247	161	49	137	42	22	198	1580	143	86	1295
RTOR Reduction (vph)	0	24	0	0	9	0	0	0	9	0	0	1
Lane Group Flow (vph)	0	396	0	0	219	0	0	220	1714	0	86	1308
Confl. Peds. (#/hr)	11		15	15		11		12		20	20	
Confl. Bikes (#/hr)			16			12				15		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		28.2			28.2			22.4	48.9		8.4	34.9
Effective Green, g (s)		28.2			28.2			22.4	48.9		8.4	34.9
Actuated g/C Ratio		0.28			0.28			0.22	0.49		0.08	0.35
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		490			347			396	2440		148	1770
v/s Ratio Prot								0.12	c0.34		0.05	c0.26
v/s Ratio Perm		c0.23			0.18							
v/c Ratio		0.81			0.63			0.56	0.70		0.58	0.74
Uniform Delay, d1		33.4			31.3			34.4	19.9		44.1	28.6
Progression Factor		1.00			1.00			0.51	0.34		1.00	1.00
Incremental Delay, d2		9.4			3.7			1.4	1.5		5.7	2.8
Delay (s)		42.8			35.0			19.1	8.2		49.8	31.4
Level of Service		D			D			B	A		D	C
Approach Delay (s)		42.8			35.0				9.5			32.5
Approach LOS		D			D				A			C

Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	86.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	14
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	14
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	12
Confl. Bikes (#/hr)	15
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	17	446	9	6	174	9	12	12	22	11	9	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	17	446	9	6	174	9	12	12	22	11	9	30
Pedestrians		4			13			7			17	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked				0.95			0.95	0.95	0.95	0.95	0.95	
vC, conflicting volume	200			462			720	704	470	733	704	200
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	200			403			676	658	412	689	658	200
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			96	97	96	96	97	96
cM capacity (veh/h)	1335			1077			318	352	600	301	348	824

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	472	189	46	50
Volume Left	17	6	12	11
Volume Right	9	9	22	30
cSH	1335	1077	424	506
Volume to Capacity	0.01	0.01	0.11	0.10
Queue Length 95th (ft)	1	0	9	8
Control Delay (s)	0.4	0.3	14.5	12.9
Lane LOS	A	A	B	B
Approach Delay (s)	0.4	0.3	14.5	12.9
Approach LOS			B	B

Intersection Summary					
Average Delay	2.1				
Intersection Capacity Utilization	45.4%	ICU Level of Service		A	
Analysis Period (min)	15				

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
DC_Existing PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	348	43	16	134	36	27	523	33	18	530	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.97			0.99			0.99	
Flt Protected		0.99			1.00			1.00			1.00	
Satd. Flow (prot)		1762			1772			1839			1863	
Flt Permitted		0.93			0.96			0.96			0.98	
Satd. Flow (perm)		1647			1702			1775			1824	
Peak-hour factor, PHF	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. Flow (vph)	70	348	43	16	134	36	27	523	33	18	530	24
RTOR Reduction (vph)	0	4	0	0	11	0	0	3	0	0	2	0
Lane Group Flow (vph)	0	457	0	0	175	0	0	580	0	0	570	0
Confl. Peds. (#/hr)	11		11	11		11	19		7	7		19
Confl. Bikes (#/hr)			15			10			31			22
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		29.0			29.0			43.0			43.0	
Effective Green, g (s)		29.0			29.0			43.0			43.0	
Actuated g/C Ratio		0.36			0.36			0.54			0.54	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		597			616			954			980	
v/s Ratio Prot												
v/s Ratio Perm		c0.28			0.10			c0.33			0.31	
v/c Ratio		0.76			0.28			0.61			0.58	
Uniform Delay, d1		22.5			18.1			12.7			12.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		9.0			1.2			2.9			2.5	
Delay (s)		31.5			19.3			15.6			15.0	
Level of Service		C			B			B			B	
Approach Delay (s)		31.5			19.3			15.6			15.0	
Approach LOS		C			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	19.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	88.5%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
DC_Existing PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	283	20	94	38	14	18	70	880	57	20	925	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			0.99		0.99	1.00		0.99	1.00	
Frt		0.97			0.97		1.00	0.99		1.00	0.99	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1659			1692		1752	3490		1772	3488	
Flt Permitted		0.76			0.77		0.21	1.00		0.24	1.00	
Satd. Flow (perm)		1307			1341		389	3490		450	3488	
Peak-hour factor, PHF	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. Flow (vph)	283	20	94	38	14	18	70	880	57	20	925	96
RTOR Reduction (vph)	0	13	0	0	12	0	0	5	0	0	8	0
Lane Group Flow (vph)	0	384	0	0	58	0	70	932	0	20	1013	0
Confl. Peds. (#/hr)	11		26	26		11	25		17	17		25
Confl. Bikes (#/hr)			8			9			29			45
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		30.8			30.8		50.2	50.2		50.2	50.2	
Effective Green, g (s)		30.8			30.8		50.2	50.2		50.2	50.2	
Actuated g/C Ratio		0.34			0.34		0.56	0.56		0.56	0.56	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		447			458		216	1946		251	1945	
v/s Ratio Prot								0.27			c0.29	
v/s Ratio Perm		c0.29			0.04		0.18			0.04		
v/c Ratio		0.86			0.13		0.32	0.48		0.08	0.52	
Uniform Delay, d1		27.6			20.4		10.7	12.0		9.2	12.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		15.0			0.1		3.9	0.8		0.6	1.0	
Delay (s)		42.6			20.5		14.7	12.9		9.8	13.4	
Level of Service		D			C		B	B		A	B	
Approach Delay (s)		42.6			20.5			13.0			13.3	
Approach LOS		D			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	73.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (veh/h)	4	5	38	14	2	8	11	32	1904	43	6	9
Sign Control		Stop			Stop				Free			
Grade		0%			0%				0%			
Peak Hour 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
Hourly flow rate (vph)	4	5	38	14	2	8	0	32	1904	43	0	9
Pedestrians		5			19				11			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		0			2				1			
Right turn flare (veh)												
Median type									None			
Median storage veh)												
Upstream signal (ft)									299			
pX, platoon unblocked	0.88	0.88	0.78	0.88	0.88	0.79	0.00	0.78			0.00	0.79
vC, conflicting volume	2230	3552	518	2577	3534	675	0	1508			0	1966
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	297	1793	0	689	1773	0	0	648			0	1276
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			0.0	4.1
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	*5.0	*5.0	*5.0	0.0	2.2			0.0	2.2
p0 queue free %	99	92	95	93	97	99	0	96			0	98
cM capacity (veh/h)	506	66	836	193	64	557	0	722			0	422

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	47	24	508	952	519	383	748	381
Volume Left	4	14	32	0	0	9	0	0
Volume Right	38	8	0	0	43	0	0	7
cSH	364	203	722	1700	1700	422	1700	1700
Volume to Capacity	0.13	0.12	0.04	0.56	0.31	0.02	0.44	0.22
Queue Length 95th (ft)	11	10	3	0	0	2	0	0
Control Delay (s)	16.3	25.1	1.2	0.0	0.0	0.7	0.0	0.0
Lane LOS	C	D	A			A		
Approach Delay (s)	16.3	25.1	0.3			0.2		
Approach LOS	C	D						

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	81.9%	ICU Level of Service	D	
Analysis Period (min)	15			

* User Entered Value

Movement	SBT	SBR
Lane Configurations		
Volume (veh/h)	1496	7
Sign Control	Free	
Grade	0%	
Peak Hour Factor	1.00	1.00
Hourly flow rate (vph)	1496	7
Pedestrians		
Lane Width (ft)		
Walking Speed (ft/s)		
Percent Blockage		
Right turn flare (veh)		
Median type	None	
Median storage veh)		
Upstream signal (ft)	294	
pX, platoon unblocked		
vC, conflicting volume		
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol		
tC, single (s)		
tC, 2 stage (s)		
tF (s)		
p0 queue free %		
cM capacity (veh/h)		

Direction, Lane #

HCM Unsignalized Intersection Capacity Analysis
6: Dover Street & 54th Street

Children's Hospital
DC_Existing PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	38	4	2	5	11	8	31	4	7	17	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	8	38	4	2	5	11	8	31	4	7	17	2
Pedestrians		12			8			6			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	110	103	36	118	102	44	31			43		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	110	103	36	118	102	44	31			43		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	95	100	100	99	99	99			100		
cM capacity (veh/h)	832	770	1027	801	771	1022	1579			1568		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	50	18	43	26
Volume Left	8	2	8	7
Volume Right	4	11	4	2
cSH	796	912	1579	1568
Volume to Capacity	0.06	0.02	0.01	0.00
Queue Length 95th (ft)	5	2	0	0
Control Delay (s)	9.8	9.0	1.4	2.0
Lane LOS	A	A	A	A
Approach Delay (s)	9.8	9.0	1.4	2.0
Approach LOS	A	A		

Intersection Summary				
Average Delay	5.6			
Intersection Capacity Utilization	19.1%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
7: Shattuck Ave & 54th Street

Children's Hospital
DC_Existing PM Plus Phase 1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	3	42	11	601	614	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	3	42	11	601	614	3
Pedestrians	25				1	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	2				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.83	0.79	0.79			
vC, conflicting volume	1264	640	642			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1003	416	418			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	92	99			
cM capacity (veh/h)	218	498	886			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	45	612	617
Volume Left	3	11	0
Volume Right	42	0	3
cSH	458	886	1700
Volume to Capacity	0.10	0.01	0.36
Queue Length 95th (ft)	8	1	0
Control Delay (s)	13.7	0.3	0.0
Lane LOS	B	A	
Approach Delay (s)	13.7	0.3	0.0
Approach LOS	B		

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	50.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	2	3	52	46	6	4	7	9	1993	68	2	1581
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.88			0.99			1.00	1.00		1.00	1.00
Flt Protected		1.00			0.96			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1600			1801			1770	5040		1787	5133
Flt Permitted		0.99			0.74			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1592			1391			1770	5040		1787	5133
Peak-hour factor, PHF	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. Flow (vph)	2	3	52	46	6	4	7	9	1993	68	2	1581
RTOR Reduction (vph)	0	43	0	0	3	0	0	0	2	0	0	0
Lane Group Flow (vph)	0	14	0	0	53	0	0	16	2059	0	2	1585
Confl. Peds. (#/hr)	8		4	4		8		14		32	32	
Confl. Bikes (#/hr)			4			2				13		
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		16.4			16.4			3.0	69.3		1.8	68.1
Effective Green, g (s)		16.4			16.4			3.0	69.3		1.8	68.1
Actuated g/C Ratio		0.16			0.16			0.03	0.69		0.02	0.68
Clearance Time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		261			228			53	3492		32	3495
v/s Ratio Prot								0.01	c0.41		0.00	c0.31
v/s Ratio Perm		0.01			c0.04							
v/c Ratio		0.05			0.23			0.30	0.59		0.06	0.45
Uniform Delay, d1		35.2			36.3			47.5	8.0		48.3	7.4
Progression Factor		1.00			1.03			1.42	0.21		0.78	0.47
Incremental Delay, d2		0.1			0.5			2.4	0.5		0.6	0.3
Delay (s)		35.3			37.8			69.9	2.2		38.5	3.8
Level of Service		D			D			E	A		D	A
Approach Delay (s)		35.3			37.8				2.8			3.8
Approach LOS		D			D				A			A

Intersection Summary			
HCM 2000 Control Delay	4.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: MLK Way & 53rd Street

Children's Hospital
DC_Existing PM Plus Phase 1

Movement	SBR
Lane Configurations	
Volume (vph)	4
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	4
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	14
Confl. Bikes (#/hr)	16
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis
9: Dover Street & 53rd Street

Children's Hospital
DC_Existing PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	41	8	0	0	6	5	0	0	0	1	0	28
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	41	8	0	0	6	5	0	0	0	1	0	28
Pedestrians		25			10			4			4	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			1			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	53	51	43	34	65	14	53			10		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	53	51	43	34	65	14	53			10		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	99	100	100	99	100	100			100		
cM capacity (veh/h)	897	819	1008	938	805	1059	1533			1609		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	49	11	0	29
Volume Left	41	0	0	1
Volume Right	0	5	0	28
cSH	884	904	1700	1609
Volume to Capacity	0.06	0.01	0.00	0.00
Queue Length 95th (ft)	4	1	0	0
Control Delay (s)	9.3	9.0	0.0	0.3
Lane LOS	A	A		A
Approach Delay (s)	9.3	9.0	0.0	0.3
Approach LOS	A	A		

Intersection Summary				
Average Delay		6.3		
Intersection Capacity Utilization		25.8%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
10: MLK Way & 52nd Street

Children's Hospital
DC_Existing PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	76	107	95	110	81	238	42	74	1685	71	4	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.96			1.00	0.97		1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00			0.98	1.00		1.00	1.00			1.00
Frt	1.00	0.93			1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00			0.97	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1767	1685			1768	1535		1787	5097			1787
Flt Permitted	0.53	1.00			0.58	1.00		0.95	1.00			0.95
Satd. Flow (perm)	993	1685			1053	1535		1787	5097			1787
Peak-hour factor, PHF	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. Flow (vph)	76	107	95	110	81	238	42	74	1685	71	4	180
RTOR Reduction (vph)	0	35	0	0	0	180	0	0	4	0	0	0
Lane Group Flow (vph)	76	167	0	0	191	58	0	116	1752	0	0	184
Confl. Peds. (#/hr)	16		61	61		16		13		10		10
Confl. Bikes (#/hr)			9			4				15		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	24.4	24.4			24.4	24.4		10.8	44.6			17.5
Effective Green, g (s)	24.4	24.4			24.4	24.4		10.8	44.6			17.5
Actuated g/C Ratio	0.24	0.24			0.24	0.24		0.11	0.45			0.18
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	242	411			256	374		192	2273			312
v/s Ratio Prot		0.10						0.06	c0.34			0.10
v/s Ratio Perm	0.08				c0.18	0.04						
v/c Ratio	0.31	0.41			0.75	0.16		0.60	0.77			0.59
Uniform Delay, d1	30.9	31.7			34.9	29.7		42.6	23.4			37.9
Progression Factor	1.00	1.00			0.91	2.42		0.98	1.06			0.61
Incremental Delay, d2	0.3	0.2			9.5	0.1		1.6	1.1			1.7
Delay (s)	31.2	32.0			41.5	71.8		43.3	25.9			25.0
Level of Service	C	C			D	E		D	C			C
Approach Delay (s)		31.8			58.3				26.9			
Approach LOS		C			E				C			

Intersection Summary					
HCM 2000 Control Delay		22.7	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio		0.74			
Actuated Cycle Length (s)		100.0	Sum of lost time (s)		14.0
Intersection Capacity Utilization		104.3%	ICU Level of Service		G
Analysis Period (min)		15			

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1508	3
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5133	
Flt Permitted	1.00	
Satd. Flow (perm)	5133	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1508	3
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1511	0
Confl. Peds. (#/hr)		13
Confl. Bikes (#/hr)		17
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	50.8	
Effective Green, g (s)	50.8	
Actuated g/C Ratio	0.51	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2607	
v/s Ratio Prot	c0.29	
v/s Ratio Perm		
v/c Ratio	0.58	
Uniform Delay, d1	17.2	
Progression Factor	0.26	
Incremental Delay, d2	0.9	
Delay (s)	5.4	
Level of Service	A	
Approach Delay (s)	7.5	
Approach LOS	A	

Intersection Summary			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	352	7	9	351	2	25	3	13	0	4	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.95			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.96			0.87	
Flt Protected		1.00			1.00			0.97			1.00	
Satd. Flow (prot)		3518			3595			1452			1640	
Flt Permitted		0.95			0.95			0.89			1.00	
Satd. Flow (perm)		3360			3404			1333			1640	
Peak-hour factor, PHF	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. Flow (vph)	3	352	7	9	351	2	25	3	13	0	4	59
RTOR Reduction (vph)	0	3	0	0	1	0	0	7	0	0	32	0
Lane Group Flow (vph)	0	359	0	0	361	0	0	34	0	0	31	0
Confl. Peds. (#/hr)	25		59	59		25			208	208		
Confl. Bikes (#/hr)			10			6						1
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Prot	NA		Perm	NA		Perm	NA			NA	
Protected Phases	5	2			6			4			8	
Permitted Phases				6			4			8		
Actuated Green, G (s)		21.0			14.0			23.0			23.0	
Effective Green, g (s)		21.0			14.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.28			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1423			953			613			754	
v/s Ratio Prot		c0.02									0.02	
v/s Ratio Perm		0.09			c0.11			c0.03				
v/c Ratio		0.25			0.38			0.06			0.04	
Uniform Delay, d1		9.4			14.5			7.5			7.4	
Progression Factor		1.84			1.00			1.00			1.00	
Incremental Delay, d2		0.4			1.1			0.2			0.1	
Delay (s)		17.7			15.6			7.7			7.5	
Level of Service		B			B			A			A	
Approach Delay (s)		17.7			15.6			7.7			7.5	
Approach LOS		B			B			A			A	

Intersection Summary					
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.19				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	9.0		
Intersection Capacity Utilization	42.1%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
12: 52nd Street & Dover Street

Children's Hospital
DC_Existing PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	347	8	5	350	4	7	0	8	10	0	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	8	347	8	5	350	4	7	0	8	10	0	14
Pedestrians		37			7			35			15	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			1			3			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.91			0.89			0.94	0.94	0.89	0.94	0.94	0.91
vC, conflicting volume	369			390			815	781	393	759	783	404
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	252			254			545	509	257	485	511	291
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	99			100			98	100	99	98	100	98
cM capacity (veh/h)	1170			1139			362	405	655	433	417	653

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	363	359	15	24
Volume Left	8	5	7	10
Volume Right	8	4	8	14
cSH	1170	1139	476	539
Volume to Capacity	0.01	0.00	0.03	0.04
Queue Length 95th (ft)	1	0	2	3
Control Delay (s)	0.2	0.2	12.8	12.0
Lane LOS	A	A	B	B
Approach Delay (s)	0.2	0.2	12.8	12.0
Approach LOS			B	B

Intersection Summary					
Average Delay			0.8		
Intersection Capacity Utilization			40.6%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis
13: SR-24 NB Off-Ramp & 52nd Street

Children's Hospital
DC_Existing PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	360	0	0	366	1003	0	1024	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	360	0	0	366	1003	0	1024	0	0
Pedestrians							33		9	
Lane Width (ft)							12.0		0.0	
Walking Speed (ft/s)							4.0		4.0	
Percent Blockage							3		0	
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.84						0.84		0.84	0.84
vC, conflicting volume	1378			393			1771	213	1579	768
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1060			393			1530	213	1301	331
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	546			1130			94	767	0	478

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	180	180	244	456	669	512	512
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	334	669	512	512
cSH	1700	1700	1700	1700	1700	767	767
Volume to Capacity	0.11	0.11	0.14	0.27	0.39	0.67	0.67
Queue Length 95th (ft)	0	0	0	0	0	129	129
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	18.6	18.6
Lane LOS						C	C
Approach Delay (s)	0.0		0.0			18.6	
Approach LOS						C	

Intersection Summary					
Average Delay			6.9		
Intersection Capacity Utilization			54.7%	ICU Level of Service	A
Analysis Period (min)			15		

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	40	302	850	172	35	831	129	146	207	40	161	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.99		1.00	0.99		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			0.99
Frt		1.00	0.97		1.00	0.98		1.00	0.98			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.97
Satd. Flow (prot)		1787	4944		1805	5037		1748	1783			1712
Flt Permitted		0.95	1.00		0.95	1.00		0.27	1.00			0.71
Satd. Flow (perm)		1787	4944		1805	5037		493	1783			1243
Peak-hour factor, PHF	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. Flow (vph)	40	302	850	172	35	831	129	146	207	40	161	143
RTOR Reduction (vph)	0	0	26	0	0	19	0	0	6	0	0	0
Lane Group Flow (vph)	0	342	996	0	35	941	0	146	241	0	0	304
Confl. Peds. (#/hr)		11		14	14		11	18		22	22	
Confl. Bikes (#/hr)				13			8			30		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		33.5	57.2		3.9	27.6		34.9	34.9			25.4
Effective Green, g (s)		33.5	57.2		3.9	27.6		34.9	34.9			25.4
Actuated g/C Ratio		0.30	0.52		0.04	0.25		0.32	0.32			0.23
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		544	2570		63	1263		219	565			287
v/s Ratio Prot		c0.19	0.20		0.02	c0.19		c0.03	0.14			
v/s Ratio Perm								0.18				c0.24
v/c Ratio		0.63	0.39		0.56	0.75		0.67	0.43			1.06
Uniform Delay, d1		32.9	15.9		52.2	38.0		31.8	29.6			42.3
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Incremental Delay, d2		5.4	0.4		10.2	4.0		7.5	2.3			69.6
Delay (s)		38.3	16.3		62.4	42.0		39.2	32.0			111.9
Level of Service		D	B		E	D		D	C			F
Approach Delay (s)			21.8			42.7			34.7			71.3
Approach LOS			C			D			C			E

Intersection Summary			
HCM 2000 Control Delay	38.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	100.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: 52nd Street & Shattuck Ave

Children's Hospital
DC_Existing PM Plus Phase 1

Movement	SBR
Lane Configurations	
Volume (vph)	353
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.94
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1421
Flt Permitted	1.00
Satd. Flow (perm)	1421
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	353
RTOR Reduction (vph)	271
Lane Group Flow (vph)	82
Confl. Peds. (#/hr)	18
Confl. Bikes (#/hr)	27
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	25.4
Effective Green, g (s)	25.4
Actuated g/C Ratio	0.23
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	328
v/s Ratio Prot	
v/s Ratio Perm	0.06
v/c Ratio	0.25
Uniform Delay, d1	34.5
Progression Factor	1.00
Incremental Delay, d2	1.8
Delay (s)	36.3
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
15: Telegraph Ave & 52nd Street/Claremont Ave

Children's Hospital
DC_Existing PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	13	7	13	99	72	157	14	842	224	101	667	281
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.95			0.99		1.00	0.93	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.95		1.00	0.90			0.97		1.00	0.96	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1623		1698	1532			3794		1770	3149	
Flt Permitted		0.98		0.95	1.00			0.94		0.95	1.00	
Satd. Flow (perm)		1623		1698	1532			3561		1770	3149	
Peak-hour factor, PHF	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. Flow (vph)	13	7	13	99	72	157	14	842	224	101	667	281
RTOR Reduction (vph)	0	12	0	0	74	0	0	19	0	0	36	0
Lane Group Flow (vph)	0	21	0	89	165	0	0	1061	0	101	912	0
Confl. Peds. (#/hr)	34					34	70		22	22		70
Confl. Bikes (#/hr)			1			10			35			48
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		4.6		16.9	16.9			51.2		9.3	65.0	
Effective Green, g (s)		4.6		16.9	16.9			51.2		9.3	65.0	
Actuated g/C Ratio		0.05		0.17	0.17			0.51		0.09	0.65	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		74		286	258			1823		164	2046	
v/s Ratio Prot		c0.01		0.05	c0.11					c0.06	0.29	
v/s Ratio Perm								c0.30				
v/c Ratio		0.28		0.31	0.64			0.58		0.62	0.45	
Uniform Delay, d1		46.1		36.4	38.7			17.0		43.6	8.6	
Progression Factor		1.88		1.00	1.00			0.60		1.00	1.00	
Incremental Delay, d2		1.2		0.6	5.1			1.1		6.7	0.7	
Delay (s)		87.7		37.1	43.9			11.3		50.3	9.3	
Level of Service		F		D	D			B		D	A	
Approach Delay (s)		87.7			42.0			11.3			13.3	
Approach LOS		F			D			B			B	

Intersection Summary				
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	87.3%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
16: Telegraph Ave & 51St Street

Children's Hospital
DC_Existing PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	305	607	85	56	477	229	79	574	97	262	476	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.97		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3402		1787	3314		1719	3311		1752	3401	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3402		1787	3314		1719	3311		1752	3401	
Peak-hour factor, PHF	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. Flow (vph)	305	607	85	56	477	229	79	574	97	262	476	44
RTOR Reduction (vph)	0	11	0	0	57	0	0	13	0	0	7	0
Lane Group Flow (vph)	305	681	0	56	649	0	79	658	0	262	513	0
Confl. Peds. (#/hr)	38		52	52		38	92		57	57		92
Confl. Bikes (#/hr)			8			15			34			54
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.0	29.3		7.4	23.2		7.7	33.8		13.0	40.1	
Effective Green, g (s)	14.0	29.3		7.4	23.2		7.7	33.8		13.0	40.1	
Actuated g/C Ratio	0.14	0.29		0.07	0.23		0.08	0.34		0.13	0.40	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	476	996		132	768		132	1119		227	1363	
v/s Ratio Prot	c0.09	0.20		0.03	c0.20		0.05	c0.20		c0.15	0.15	
v/s Ratio Perm												
v/c Ratio	0.64	0.68		0.42	0.85		0.60	0.59		1.15	0.38	
Uniform Delay, d1	40.6	31.3		44.3	36.7		44.7	27.3		43.5	21.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.17	0.74	
Incremental Delay, d2	2.9	3.8		2.2	11.1		7.1	2.3		105.5	0.7	
Delay (s)	43.6	35.1		46.5	47.7		51.8	29.6		156.5	16.3	
Level of Service	D	D		D	D		D	C		F	B	
Approach Delay (s)		37.7			47.6			31.9			63.3	
Approach LOS		D			D			C			E	

Intersection Summary				
HCM 2000 Control Delay	44.8	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	78.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	268	0	0	0	0	1616	0	0	0	0	1547	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	268	0	0	0	0	1616	0	0	0	0	1547	235
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	268	0	0	0	0	1616	0	0	0	0	1547	235
Confl. Peds. (#/hr)			2	2			18					18
Confl. Bikes (#/hr)									9			12
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	13.0					50.0					29.0	50.0
Effective Green, g (s)	13.0					50.0					29.0	50.0
Actuated g/C Ratio	0.26					1.00					0.58	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	850					1627					2072	2814
v/s Ratio Prot	0.08										0.43	0.08
v/s Ratio Perm						c0.99						
v/c Ratio	0.32					0.99					0.75	0.08
Uniform Delay, d1	14.9					0.0					7.8	0.0
Progression Factor	1.00					1.00					2.62	1.00
Incremental Delay, d2	1.0					20.8					2.1	0.0
Delay (s)	15.9					20.8					22.5	0.0
Level of Service	B					C					C	A
Approach Delay (s)		15.9			20.8			0.0			19.5	
Approach LOS		B			C			A			B	

Intersection Summary				
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	1.18			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	57.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	112	8	83	93	0	43	0	134	6	52	4
Peak Hour 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
Hourly flow rate (vph)	0	112	8	83	93	0	43	0	134	6	52	4

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	120	176	43	134	62
Volume Left (vph)	0	83	43	0	6
Volume Right (vph)	8	0	0	134	4
Hadj (s)	-0.02	0.13	0.50	-0.70	0.01
Departure Headway (s)	4.7	4.8	5.8	4.6	5.0
Degree Utilization, x	0.16	0.23	0.07	0.17	0.09
Capacity (veh/h)	718	715	588	736	668
Control Delay (s)	8.5	9.2	8.0	7.3	8.4
Approach Delay (s)	8.5	9.2	7.5		8.4
Approach LOS	A	A	A		A

Intersection Summary				
Delay	8.4			
Level of Service	A			
Intersection Capacity Utilization	35.8%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	1	110	2	2	96	36	2	0	3	11	0	3
Peak Hour 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
Hourly flow rate (vph)	1	110	2	2	96	36	2	0	3	11	0	3

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	113	134	5	14
Volume Left (vph)	1	2	2	11
Volume Right (vph)	2	36	3	3
Hadj (s)	0.01	-0.16	-0.28	0.03
Departure Headway (s)	4.1	3.9	4.1	4.4
Degree Utilization, x	0.13	0.14	0.01	0.02
Capacity (veh/h)	870	912	809	753
Control Delay (s)	7.7	7.5	7.2	7.5
Approach Delay (s)	7.7	7.5	7.2	7.5
Approach LOS	A	A	A	A

Intersection Summary				
Delay			7.6	
Level of Service			A	
Intersection Capacity Utilization			20.2%	ICU Level of Service
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	12	370	1	10	339	29	8	18	29	27	3	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	12	370	1	10	339	29	8	18	29	27	3	10
Pedestrians		5						7			3	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	371			378			792	792	378	809	778	362
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	371			378			792	792	378	809	778	362
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			97	94	96	90	99	99
cM capacity (veh/h)	1190			1185			294	315	670	267	319	679

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	383	378	55	40
Volume Left	12	10	8	27
Volume Right	1	29	29	10
cSH	1190	1185	431	320
Volume to Capacity	0.01	0.01	0.13	0.13
Queue Length 95th (ft)	1	1	11	11
Control Delay (s)	0.4	0.3	14.6	17.9
Lane LOS	A	A	B	C
Approach Delay (s)	0.4	0.3	14.6	17.9
Approach LOS			B	C

Intersection Summary				
Average Delay			2.1	
Intersection Capacity Utilization			40.3%	ICU Level of Service
Analysis Period (min)			15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	123	1969	34	0	1686
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	123	1969	34	0	1686
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			154			137
pX, platoon unblocked	0.78	0.71			0.71	
vC, conflicting volume	2548	673			2003	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	766	0			981	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	84			100	
cM capacity (veh/h)	265	769			496	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	123	788	788	428	562	562	562
Volume Left	0	0	0	0	0	0	0
Volume Right	123	0	0	34	0	0	0
cSH	769	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.16	0.46	0.46	0.25	0.33	0.33	0.33
Queue Length 95th (ft)	14	0	0	0	0	0	0
Control Delay (s)	10.6	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	10.6	0.0			0.0		
Approach LOS	B						

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	53.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	1864	20	0	1755
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	1864	20	0	1755
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			424			204
pX, platoon unblocked	0.79					
vC, conflicting volume	2459	631			1884	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1932	631			1884	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	46	424			314	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	0	746	746	393	585	585	585
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	20	0	0	0
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.44	0.44	0.23	0.34	0.34	0.34
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	0.0	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	39.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	13	170	219	54	217	57	14	127	1346	61	52	1250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.93			0.98			1.00	0.99		1.00	1.00
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1707			1759			1770	5038		1770	5064
Flt Permitted		0.98			0.77			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1683			1364			1770	5038		1770	5064
Peak-hour factor, PHF	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. Flow (vph)	13	170	219	54	217	57	14	127	1346	61	52	1250
RTOR Reduction (vph)	0	56	0	0	10	0	0	0	4	0	0	2
Lane Group Flow (vph)	0	346	0	0	318	0	0	141	1403	0	52	1275
Confl. Peds. (#/hr)	7		14	14		7				21		
Confl. Bikes (#/hr)			16			15				6		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		25.9			25.9			15.3	45.1		4.5	34.3
Effective Green, g (s)		25.9			25.9			15.3	45.1		4.5	34.3
Actuated g/C Ratio		0.29			0.29			0.17	0.50		0.05	0.38
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		484			392			300	2524		88	1929
v/s Ratio Prot								0.08	c0.28		0.03	c0.25
v/s Ratio Perm		0.21			c0.23							
v/c Ratio		0.72			0.81			0.47	0.56		0.59	0.66
Uniform Delay, d1		28.7			29.8			33.7	15.5		41.8	23.0
Progression Factor		1.00			1.00			0.52	0.11		1.00	1.00
Incremental Delay, d2		5.0			12.0			1.1	0.8		10.2	1.8
Delay (s)		33.7			41.8			18.6	2.6		52.0	24.8
Level of Service		C			D			B	A		D	C
Approach Delay (s)		33.7			41.8				4.1			25.9
Approach LOS		C			D				A			C

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	85.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	27
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	27
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	12
Confl. Bikes (#/hr)	7
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	261	6	20	296	6	7	8	11	8	6	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	18	261	6	20	296	6	7	8	11	8	6	21
Pedestrians		9			20			15			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked	0.91						0.91	0.91		0.91	0.91	0.91
vC, conflicting volume	308			282			687	663	299	680	663	314
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	186			282			604	577	299	596	577	192
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			98	98	98	98	98	97
cM capacity (veh/h)	1237			1253			340	372	724	343	368	758

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	285	322	26	35
Volume Left	18	20	7	8
Volume Right	6	6	11	21
cSH	1237	1253	454	520
Volume to Capacity	0.01	0.02	0.06	0.07
Queue Length 95th (ft)	1	1	5	5
Control Delay (s)	0.6	0.6	13.4	12.4
Lane LOS	A	A	B	B
Approach Delay (s)	0.6	0.6	13.4	12.4
Approach LOS			B	B

Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	36.8%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
DC_Existing AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	199	40	30	250	31	28	430	27	25	544	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.99			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.99			0.99			0.99	
Flt Protected		0.99			1.00			1.00			1.00	
Satd. Flow (prot)		1743			1802			1839			1861	
Flt Permitted		0.90			0.96			0.95			0.97	
Satd. Flow (perm)		1578			1735			1758			1813	
Peak-hour factor, PHF	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. Flow (vph)	50	199	40	30	250	31	28	430	27	25	544	28
RTOR Reduction (vph)	0	8	0	0	5	0	0	2	0	0	2	0
Lane Group Flow (vph)	0	281	0	0	306	0	0	483	0	0	595	0
Confl. Peds. (#/hr)	6		13	13		6	7		17	17		7
Confl. Bikes (#/hr)			22			10			13			24
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		25.0			25.0			47.0			47.0	
Effective Green, g (s)		25.0			25.0			47.0			47.0	
Actuated g/C Ratio		0.31			0.31			0.59			0.59	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		493			542			1032			1065	
v/s Ratio Prot												
v/s Ratio Perm		c0.18			0.18			0.27			c0.33	
v/c Ratio		0.57			0.56			0.47			0.56	
Uniform Delay, d1		23.0			23.0			9.4			10.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		4.7			4.2			1.5			2.1	
Delay (s)		27.8			27.2			10.9			12.2	
Level of Service		C			C			B			B	
Approach Delay (s)		27.8			27.2			10.9			12.2	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	72.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
DC_Existing AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	151	14	77	32	10	9	58	715	40	27	826	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		0.99	1.00	
Frt		0.96			0.98		1.00	0.99		1.00	0.97	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1655			1713		1761	3497		1768	3406	
Flt Permitted		0.78			0.79		0.22	1.00		0.34	1.00	
Satd. Flow (perm)		1331			1403		415	3497		636	3406	
Peak-hour factor, PHF	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. Flow (vph)	151	14	77	32	10	9	58	715	40	27	826	241
RTOR Reduction (vph)	0	29	0	0	7	0	0	4	0	0	29	0
Lane Group Flow (vph)	0	213	0	0	44	0	58	751	0	27	1038	0
Confl. Peds. (#/hr)	6		11	11		6	13		17	17		13
Confl. Bikes (#/hr)			15			15			43			27
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		16.9			16.9		44.1	44.1		44.1	44.1	
Effective Green, g (s)		16.9			16.9		44.1	44.1		44.1	44.1	
Actuated g/C Ratio		0.24			0.24		0.63	0.63		0.63	0.63	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		321			338		261	2203		400	2145	
v/s Ratio Prot								0.21			c0.30	
v/s Ratio Perm		c0.16			0.03		0.14			0.04		
v/c Ratio		0.66			0.13		0.22	0.34		0.07	0.48	
Uniform Delay, d1		24.0			20.8		5.6	6.1		5.0	6.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.1			0.2		2.0	0.4		0.3	0.8	
Delay (s)		29.1			21.0		7.5	6.5		5.3	7.7	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		29.1			21.0			6.6			7.6	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	62.9%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	4	3	43	5	3	8	11	15	1522	16	5	1497
Sign Control		Stop			Stop				Free			Free
Grade		0%			0%				0%			0%
Peak Hour 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
Hourly flow rate (vph)	4	3	43	5	3	8	0	15	1522	16	5	1497
Pedestrians		7			6				8			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		1			1				1			
Right turn flare (veh)												
Median type									None			None
Median storage veh)												
Upstream signal (ft)									299			294
pX, platoon unblocked	0.88	0.88	0.80	0.88	0.88	0.84	0.00	0.80			0.84	
vC, conflicting volume	2064	3092	518	2128	3087	521	0	1511			1544	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	510	1684	0	582	1678	0	0	750			995	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			4.1	
tC, 2 stage (s)												
tF (s)	*5.0	*5.0	*5.0	*5.0	*5.0	*5.0	0.0	2.2			2.2	
p0 queue free %	99	96	92	98	96	99	0	98			99	
cM capacity (veh/h)	280	75	567	234	75	604	0	677			585	

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	50	16	396	761	396	379	748	381
Volume Left	4	5	15	0	0	5	0	0
Volume Right	43	8	0	0	16	0	0	7
cSH	384	215	677	1700	1700	585	1700	1700
Volume to Capacity	0.13	0.07	0.02	0.45	0.23	0.01	0.44	0.22
Queue Length 95th (ft)	11	6	2	0	0	1	0	0
Control Delay (s)	15.8	23.1	0.7	0.0	0.0	0.3	0.0	0.0
Lane LOS	C	C	A			A		
Approach Delay (s)	15.8	23.1	0.2			0.1		
Approach LOS	C	C						

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	60.9%	ICU Level of Service	B	
Analysis Period (min)	15			

* User Entered Value

Movement	SBR
Lane Configurations	
Volume (veh/h)	7
Sign Control	
Grade	
Peak Hour Factor	1.00
Hourly flow rate (vph)	7
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	
tC, single (s)	
tC, 2 stage (s)	
tF (s)	
p0 queue free %	
cM capacity (veh/h)	

Direction, Lane #

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	11	6	4	6	9	8	17	11	4	33	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	5	11	6	4	6	9	8	17	11	4	33	5
Pedestrians		10			14			2			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	110	112	48	110	108	42	48			42		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	110	112	48	110	108	42	48			42		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	99	100	99	99	99			100		
cM capacity (veh/h)	831	761	1017	830	764	1017	1559			1562		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	22	19	36	42
Volume Left	5	4	8	4
Volume Right	6	9	11	5
cSH	834	883	1559	1562
Volume to Capacity	0.03	0.02	0.01	0.00
Queue Length 95th (ft)	2	2	0	0
Control Delay (s)	9.4	9.2	1.7	0.7
Lane LOS	A	A	A	A
Approach Delay (s)	9.4	9.2	1.7	0.7
Approach LOS	A	A		

Intersection Summary				
Average Delay	4.0			
Intersection Capacity Utilization	19.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	20	12	490	592	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	20	12	490	592	5
Pedestrians	9			2	1	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.81	0.81	0.81			
vC, conflicting volume	1118	606	606			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1015	392	393			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	96	99			
cM capacity (veh/h)	211	529	934			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	21	502	597
Volume Left	1	12	0
Volume Right	20	0	5
cSH	493	934	1700
Volume to Capacity	0.04	0.01	0.35
Queue Length 95th (ft)	3	1	0
Control Delay (s)	12.6	0.4	0.0
Lane LOS	B	A	
Approach Delay (s)	12.6	0.4	0.0
Approach LOS	B		

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	46.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	0	38	42	4	10	21	1560	62	2	1572	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.98			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Frt		0.88			0.98		1.00	0.99		1.00	1.00	
Flt Protected		1.00			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1596			1771		1770	5045		1787	5132	
Flt Permitted		0.98			0.78		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1571			1430		1770	5045		1787	5132	
Peak-hour factor, PHF	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. Flow (vph)	4	0	38	42	4	10	21	1560	62	2	1572	5
RTOR Reduction (vph)	0	34	0	0	8	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	8	0	0	48	0	21	1619	0	2	1577	0
Confl. Peds. (#/hr)	7		13	13		7			13			20
Confl. Bikes (#/hr)									5			13
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		16.2			16.2		3.0	59.5		1.8	58.3	
Effective Green, g (s)		16.2			16.2		3.0	59.5		1.8	58.3	
Actuated g/C Ratio		0.18			0.18		0.03	0.66		0.02	0.65	
Clearance Time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		282			257		59	3335		35	3324	
v/s Ratio Prot							0.01	c0.32		0.00	c0.31	
v/s Ratio Perm		0.00			c0.03							
v/c Ratio		0.03			0.19		0.36	0.49		0.06	0.47	
Uniform Delay, d1		30.4			31.3		42.6	7.6		43.3	8.1	
Progression Factor		1.00			1.01		1.17	0.50		0.50	0.22	
Incremental Delay, d2		0.0			0.4		2.9	0.4		0.6	0.4	
Delay (s)		30.4			32.1		52.9	4.2		22.4	2.2	
Level of Service		C			C		D	A		C	A	
Approach Delay (s)		30.4			32.1			4.8			2.2	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	4.4	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.44			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5	
Intersection Capacity Utilization	53.9%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	32	13	0	0	6	6	0	0	0	2	0	44
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	32	13	0	0	6	6	0	0	0	2	0	44
Pedestrians		22			21			2			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			2			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	59	69	46	56	91	23	66			21		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	59	69	46	56	91	23	66			21		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	98	100	100	99	99	100			100		
cM capacity (veh/h)	887	795	1009	892	773	1039	1520			1580		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	45	12	0	46
Volume Left	32	0	0	2
Volume Right	0	6	0	44
cSH	858	887	1700	1580
Volume to Capacity	0.05	0.01	0.00	0.00
Queue Length 95th (ft)	4	1	0	0
Control Delay (s)	9.4	9.1	0.0	0.3
Lane LOS	A	A		A
Approach Delay (s)	9.4	9.1	0.0	0.3
Approach LOS	A	A		

Intersection Summary				
Average Delay	5.3			
Intersection Capacity Utilization	25.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	45	73	100	75	76	253	50	56	1493	90	28	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.97			1.00	0.98		1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00			0.98	1.00		1.00	1.00			1.00
Frt	1.00	0.91			1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00			0.98	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1775	1660			1788	1544		1787	5081			1787
Flt Permitted	0.63	1.00			0.74	1.00		0.95	1.00			0.95
Satd. Flow (perm)	1169	1660			1351	1544		1787	5081			1787
Peak-hour factor, PHF	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. Flow (vph)	45	73	100	75	76	253	50	56	1493	90	28	125
RTOR Reduction (vph)	0	63	0	0	0	190	0	0	6	0	0	0
Lane Group Flow (vph)	45	110	0	0	151	63	0	106	1577	0	0	153
Confl. Peds. (#/hr)	10		49	49		10				7		
Confl. Bikes (#/hr)			6			5				1		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	22.4	22.4			22.4	22.4		7.2	41.6			12.5
Effective Green, g (s)	22.4	22.4			22.4	22.4		7.2	41.6			12.5
Actuated g/C Ratio	0.25	0.25			0.25	0.25		0.08	0.46			0.14
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	290	413			336	384		142	2348			248
v/s Ratio Prot		0.07						0.06	c0.31			0.09
v/s Ratio Perm	0.04				c0.11	0.04						
v/c Ratio	0.16	0.27			0.45	0.16		0.75	0.67			0.62
Uniform Delay, d1	26.4	27.2			28.6	26.5		40.5	18.9			36.5
Progression Factor	1.00	1.00			1.00	1.00		0.99	1.06			0.78
Incremental Delay, d2	0.1	0.1			0.3	0.1		8.1	0.7			2.9
Delay (s)	26.5	27.3			28.9	26.5		48.4	20.7			31.4
Level of Service	C	C			C	C		D	C			C
Approach Delay (s)		27.1			27.4				22.4			
Approach LOS		C			C				C			

Intersection Summary			
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	97.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: MLK Way & 52nd Street

Children's Hospital
DC_Existing AM Plus Phase 2

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1483	6
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5131	
Flt Permitted	1.00	
Satd. Flow (perm)	5131	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1483	6
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1489	0
Confl. Peds. (#/hr)		10
Confl. Bikes (#/hr)		10
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	46.4	
Effective Green, g (s)	46.4	
Actuated g/C Ratio	0.52	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2645	
v/s Ratio Prot	c0.29	
v/s Ratio Perm		
v/c Ratio	0.56	
Uniform Delay, d1	14.9	
Progression Factor	0.76	
Incremental Delay, d2	0.8	
Delay (s)	12.1	
Level of Service	B	
Approach Delay (s)	13.9	
Approach LOS	B	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	283	5	2	384	2	7	3	5	0	2	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.95			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.95			0.88	
Flt Protected		1.00			1.00			0.98			1.00	
Satd. Flow (prot)		1853			1897			1457			1655	
Flt Permitted		1.00			1.00			0.95			1.00	
Satd. Flow (perm)		1847			1896			1418			1655	
Peak-hour factor, PHF	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. Flow (vph)	4	283	5	2	384	2	7	3	5	0	2	15
RTOR Reduction (vph)	0	1	0	0	1	0	0	3	0	0	8	0
Lane Group Flow (vph)	0	291	0	0	387	0	0	12	0	0	9	0
Confl. Peds. (#/hr)	17		55	55		17			202	202		
Confl. Bikes (#/hr)			6			5						1
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		21.0			21.0			23.0			23.0	
Effective Green, g (s)		21.0			21.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.42			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		775			796			652			761	
v/s Ratio Prot											0.01	
v/s Ratio Perm		0.16			c0.20			c0.01				
v/c Ratio		0.38			0.49			0.02			0.01	
Uniform Delay, d1		10.0			10.6			7.4			7.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.4			2.1			0.1			0.0	
Delay (s)		11.4			12.7			7.4			7.4	
Level of Service		B			B			A			A	
Approach Delay (s)		11.4			12.7			7.4			7.4	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.24			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	6.0	
Intersection Capacity Utilization	47.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	12	206	75	45	348	5	36	0	28	2	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	12	206	75	45	348	5	36	0	28	2	0	6
Pedestrians		20			10			12			23	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			1			1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.88			0.90			0.93	0.93	0.90	0.93	0.93	0.88
vC, conflicting volume	376			293			746	746	266	769	780	394
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	227			162			455	455	132	480	492	247
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	99			96			92	100	96	100	100	99
cM capacity (veh/h)	1156			1271			426	423	794	412	415	678

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	293	398	64	8
Volume Left	12	45	36	2
Volume Right	75	5	28	6
cSH	1156	1271	534	584
Volume to Capacity	0.01	0.04	0.12	0.01
Queue Length 95th (ft)	1	3	10	1
Control Delay (s)	0.4	1.2	12.7	11.2
Lane LOS	A	A	B	B
Approach Delay (s)	0.4	1.2	12.7	11.2
Approach LOS			B	B

Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	52.8%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
13: SR-24 NB Off-Ramp & 52nd Street

Children's Hospital
DC_Existing AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	234	0	0	402	1077	0	898	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	234	0	0	402	1077	0	898	0	0
Pedestrians							24			
Lane Width (ft)							12.0			
Walking Speed (ft/s)							4.0			
Percent Blockage							2			
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.82						0.82		0.82	0.82
vC, conflicting volume	1479			258			1737	141	1417	660
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1155			258			1468	141	1080	161
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	495			1278			102	860	0	590

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	117	117	268	493	718	449	449
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	359	718	449	449
cSH	1700	1700	1700	1700	1700	860	860
Volume to Capacity	0.07	0.07	0.16	0.29	0.42	0.52	0.52
Queue Length 95th (ft)	0	0	0	0	0	77	77
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	13.7	13.7
Lane LOS						B	B
Approach Delay (s)	0.0		0.0			13.7	
Approach LOS						B	

Intersection Summary				
Average Delay	4.7			
Intersection Capacity Utilization	48.3%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
14: 52nd Street & Shattuck Ave

Children's Hospital
DC_Existing AM Plus Phase 2

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	40	288	691	148	24	897	82	154	123	30	101	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.99		1.00	1.00		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.97		1.00	0.99		1.00	0.97			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.98
Satd. Flow (prot)		1787	4946		1805	5107		1752	1781			1733
Flt Permitted		0.95	1.00		0.95	1.00		0.43	1.00			0.79
Satd. Flow (perm)		1787	4946		1805	5107		796	1781			1401
Peak-hour factor, PHF	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. Flow (vph)	40	288	691	148	24	897	82	154	123	30	101	136
RTOR Reduction (vph)	0	0	30	0	0	12	0	0	10	0	0	0
Lane Group Flow (vph)	0	328	809	0	24	967	0	154	143	0	0	237
Confl. Peds. (#/hr)				12			5			10	10	
Confl. Bikes (#/hr)				12			1			10		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		21.5	37.7		3.2	19.4		35.1	35.1			24.6
Effective Green, g (s)		21.5	37.7		3.2	19.4		35.1	35.1			24.6
Actuated g/C Ratio		0.24	0.42		0.04	0.22		0.39	0.39			0.27
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		426	2071		64	1100		379	694			382
v/s Ratio Prot		c0.18	0.16		0.01	c0.19		c0.03	0.08			
v/s Ratio Perm								0.13				c0.17
v/c Ratio		0.77	0.39		0.38	0.88		0.41	0.21			0.62
Uniform Delay, d1		31.9	18.2		42.4	34.2		18.8	18.2			28.6
Progression Factor		1.00	1.00		1.22	0.84		1.00	1.00			1.00
Incremental Delay, d2		12.6	0.6		3.1	8.6		0.7	0.7			7.4
Delay (s)		44.6	18.7		54.6	37.3		19.5	18.9			36.0
Level of Service		D	B		D	D		B	B			D
Approach Delay (s)			26.0			37.7			19.2			30.7
Approach LOS			C			D			B			C

Intersection Summary				
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		18.0
Intersection Capacity Utilization	101.4%	ICU Level of Service		G
Analysis Period (min)	15			

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	382
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.94
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1419
Flt Permitted	1.00
Satd. Flow (perm)	1419
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	382
RTOR Reduction (vph)	278
Lane Group Flow (vph)	104
Confl. Peds. (#/hr)	16
Confl. Bikes (#/hr)	41
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	24.6
Effective Green, g (s)	24.6
Actuated g/C Ratio	0.27
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	387
v/s Ratio Prot	
v/s Ratio Perm	0.07
v/c Ratio	0.27
Uniform Delay, d1	25.7
Progression Factor	1.00
Incremental Delay, d2	1.7
Delay (s)	27.4
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	0	6	94	52	154	0	665	117	64	598	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.98		1.00	0.99			0.99		1.00	0.97	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.93		1.00	0.89			0.98		1.00	0.95	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1576		1698	1569			3853		1770	3270	
Flt Permitted		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (perm)		1576		1698	1569			3853		1770	3270	
Peak-hour factor, PHF	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. Flow (vph)	6	0	6	94	52	154	0	665	117	64	598	289
RTOR Reduction (vph)	0	12	0	0	119	0	0	10	0	0	40	0
Lane Group Flow (vph)	0	0	0	85	96	0	0	772	0	64	847	0
Confl. Peds. (#/hr)	4					4	22		18			22
Confl. Bikes (#/hr)			1			2			33			27
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA			NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		1.1		15.4	15.4			48.2		7.3	60.0	
Effective Green, g (s)		1.1		15.4	15.4			48.2		7.3	60.0	
Actuated g/C Ratio		0.01		0.17	0.17			0.54		0.08	0.67	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		19		290	268			2063		143	2180	
v/s Ratio Prot		c0.00		0.05	c0.06			0.20		0.04	c0.26	
v/s Ratio Perm												
v/c Ratio		0.01		0.29	0.36			0.37		0.45	0.39	
Uniform Delay, d1		43.9		32.6	32.9			12.1		39.4	6.7	
Progression Factor		1.00		1.00	1.00			0.97		1.00	1.00	
Incremental Delay, d2		0.1		0.6	0.8			0.5		2.2	0.5	
Delay (s)		44.0		33.1	33.8			12.2		41.7	7.3	
Level of Service		D		C	C			B		D	A	
Approach Delay (s)		44.0			33.6			12.2			9.6	
Approach LOS		D			C			B			A	

Intersection Summary					
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.40				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0		
Intersection Capacity Utilization	70.8%	ICU Level of Service	C		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
16: Telegraph Ave & 51St Street

Children's Hospital
DC_Existing AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	228	490	71	101	534	238	97	320	58	147	511	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.98		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3414		1787	3350		1719	3324		1752	3447	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3414		1787	3350		1719	3324		1752	3447	
Peak-hour factor, PHF	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. Flow (vph)	228	490	71	101	534	238	97	320	58	147	511	38
RTOR Reduction (vph)	0	12	0	0	55	0	0	16	0	0	5	0
Lane Group Flow (vph)	228	549	0	101	717	0	97	362	0	147	544	0
Confl. Peds. (#/hr)			31			31			30			37
Confl. Bikes (#/hr)			9			7			27			27
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.2	29.0		8.6	26.9		8.6	24.9		11.0	28.3	
Effective Green, g (s)	11.2	29.0		8.6	26.9		8.6	24.9		11.0	28.3	
Actuated g/C Ratio	0.12	0.32		0.10	0.30		0.10	0.28		0.12	0.31	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	423	1100		170	1001		164	919		214	1083	
v/s Ratio Prot	c0.07	c0.16		0.06	c0.21		0.06	0.11		c0.08	c0.16	
v/s Ratio Perm												
v/c Ratio	0.54	0.50		0.59	0.72		0.59	0.39		0.69	0.50	
Uniform Delay, d1	37.0	24.6		39.0	28.1		39.0	26.4		37.8	25.1	
Progression Factor	1.29	0.79		1.00	1.00		1.00	1.00		1.01	0.86	
Incremental Delay, d2	1.2	1.5		5.5	4.4		5.6	1.3		8.4	1.6	
Delay (s)	48.8	21.0		44.5	32.5		44.6	27.7		46.6	23.3	
Level of Service	D	C		D	C		D	C		D	C	
Approach Delay (s)		29.0			33.9			31.2			28.2	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	70.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
17: SB SR-24 On-Ramp & MLK Way & NB SR-24 Off-Ramp

Children's Hospital
DC_Existing AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	151	0	0	0	0	1535	0	0	0	0	1434	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	151	0	0	0	0	1535	0	0	0	0	1434	235
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	151	0	0	0	0	1535	0	0	0	0	1434	235
Confl. Bikes (#/hr)		2										
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	8.0					45.0					29.0	45.0
Effective Green, g (s)	8.0					45.0					29.0	45.0
Actuated g/C Ratio	0.18					1.00					0.64	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	581					1627					2303	2814
v/s Ratio Prot	0.05										0.40	0.08
v/s Ratio Perm						c0.94						
v/c Ratio	0.26					0.94					0.62	0.08
Uniform Delay, d1	15.9					0.0					4.8	0.0
Progression Factor	1.00					1.00					1.76	1.00
Incremental Delay, d2	1.1					12.4					1.1	0.0
Delay (s)	17.0					12.4					9.5	0.0
Level of Service	B					B					A	A
Approach Delay (s)		17.0			12.4			0.0			8.1	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	1.15			
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	50.6%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	162	10	57	74	0	22	0	71	2	43	5
Peak Hour 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
Hourly flow rate (vph)	0	162	10	57	74	0	22	0	71	2	43	5

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	172	131	22	71	50
Volume Left (vph)	0	57	22	0	2
Volume Right (vph)	10	0	0	71	5
Hadj (s)	-0.02	0.12	0.50	-0.70	-0.02
Departure Headway (s)	4.4	4.6	5.8	4.6	4.8
Degree Utilization, x	0.21	0.17	0.04	0.09	0.07
Capacity (veh/h)	792	751	589	736	691
Control Delay (s)	8.5	8.5	7.8	6.8	8.2
Approach Delay (s)	8.5	8.5	7.0		8.2
Approach LOS	A	A	A		A

Intersection Summary					
Delay			8.2		
Level of Service			A		
Intersection Capacity Utilization			36.4%	ICU Level of Service	A
Analysis Period (min)			15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	5	147	1	4	79	20	1	0	3	15	0	3
Peak Hour 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
Hourly flow rate (vph)	5	147	1	4	79	20	1	0	3	15	0	3

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	153	103	4	18
Volume Left (vph)	5	4	1	15
Volume Right (vph)	1	20	3	3
Hadj (s)	0.02	-0.11	-0.40	0.07
Departure Headway (s)	4.1	4.0	4.1	4.5
Degree Utilization, x	0.17	0.11	0.00	0.02
Capacity (veh/h)	872	888	824	742
Control Delay (s)	7.9	7.5	7.1	7.6
Approach Delay (s)	7.9	7.5	7.1	7.6
Approach LOS	A	A	A	A

Intersection Summary					
Delay			7.7		
Level of Service			A		
Intersection Capacity Utilization			21.6%	ICU Level of Service	A
Analysis Period (min)			15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	354	0	4	312	10	6	11	14	32	12	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	2	354	0	4	312	10	6	11	14	32	12	8
Pedestrians		8			2			10			11	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	333			364			715	709	366	716	704	336
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	333			364			715	709	366	716	704	336
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	97	98	90	97	99
cM capacity (veh/h)	1221			1196			325	353	677	321	353	695

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	356	326	31	52
Volume Left	2	4	6	32
Volume Right	0	10	14	8
cSH	1221	1196	441	358
Volume to Capacity	0.00	0.00	0.07	0.15
Queue Length 95th (ft)	0	0	6	13
Control Delay (s)	0.1	0.1	13.8	16.7
Lane LOS	A	A	B	C
Approach Delay (s)	0.1	0.1	13.8	16.7
Approach LOS			B	C

Intersection Summary					
Average Delay	1.8				
Intersection Capacity Utilization	35.4%	ICU Level of Service		A	
Analysis Period (min)	15				

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	34	1618	201	0	1652
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	34	1618	201	0	1652
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			154			137
pX, platoon unblocked	0.84	0.76			0.76	
vC, conflicting volume	2269	640			1819	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	576	0			970	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	375	824			536	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	34	647	647	525	551	551	551
Volume Left	0	0	0	0	0	0	0
Volume Right	34	0	0	201	0	0	0
cSH	824	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.04	0.38	0.38	0.31	0.32	0.32	0.32
Queue Length 95th (ft)	3	0	0	0	0	0	0
Control Delay (s)	9.6	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	9.6	0.0			0.0		
Approach LOS	A						

Intersection Summary					
Average Delay	0.1				
Intersection Capacity Utilization	45.7%	ICU Level of Service			A
Analysis Period (min)	15				

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	1686	0	0	1708
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	1686	0	0	1708
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			424			204
pX, platoon unblocked	0.80					
vC, conflicting volume	2255	562			1686	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1701	562			1686	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	66	470			375	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	0	674	674	337	569	569	569
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.40	0.40	0.20	0.33	0.33	0.33
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	0.0	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	36.3%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	12	247	161	49	137	42	22	198	1591	143	86	1298
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.99			0.99			1.00	0.99		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.95			0.98			1.00	0.99		1.00	1.00
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1756			1751			1770	4991		1770	5074
Flt Permitted		0.99			0.70			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1739			1233			1770	4991		1770	5074
Peak-hour factor, PHF	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. Flow (vph)	12	247	161	49	137	42	22	198	1591	143	86	1298
RTOR Reduction (vph)	0	24	0	0	9	0	0	0	9	0	0	1
Lane Group Flow (vph)	0	396	0	0	219	0	0	220	1725	0	86	1311
Confl. Peds. (#/hr)	11		15	15		11		12		20	20	
Confl. Bikes (#/hr)			16			12				15		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		28.2			28.2			22.4	48.9		8.4	34.9
Effective Green, g (s)		28.2			28.2			22.4	48.9		8.4	34.9
Actuated g/C Ratio		0.28			0.28			0.22	0.49		0.08	0.35
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		490			347			396	2440		148	1770
v/s Ratio Prot								0.12	c0.35		0.05	c0.26
v/s Ratio Perm		c0.23			0.18							
v/c Ratio		0.81			0.63			0.56	0.71		0.58	0.74
Uniform Delay, d1		33.4			31.3			34.4	20.0		44.1	28.6
Progression Factor		1.00			1.00			0.52	0.37		1.00	1.00
Incremental Delay, d2		9.4			3.7			1.4	1.5		5.7	2.8
Delay (s)		42.8			35.0			19.2	8.8		49.8	31.4
Level of Service		D			D			B	A		D	C
Approach Delay (s)		42.8			35.0				10.0			32.5
Approach LOS		D			D				A			C

Intersection Summary			
HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	14
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	14
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	12
Confl. Bikes (#/hr)	15
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis
2: Dover Street & 55th Street

Children's Hospital
DC_Existing PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	17	446	9	6	174	9	12	12	22	11	9	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	17	446	9	6	174	9	12	12	22	11	9	30
Pedestrians		4			13			7			17	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked				0.95			0.95	0.95	0.95	0.95	0.95	
vC, conflicting volume	200			462			720	704	470	733	704	200
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	200			403			676	658	412	689	658	200
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			96	97	96	96	97	96
cM capacity (veh/h)	1335			1077			318	352	600	301	348	824

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	472	189	46	50
Volume Left	17	6	12	11
Volume Right	9	9	22	30
cSH	1335	1077	424	506
Volume to Capacity	0.01	0.01	0.11	0.10
Queue Length 95th (ft)	1	0	9	8
Control Delay (s)	0.4	0.3	14.5	12.9
Lane LOS	A	A	B	B
Approach Delay (s)	0.4	0.3	14.5	12.9
Approach LOS			B	B

Intersection Summary				
Average Delay			2.1	
Intersection Capacity Utilization			45.4%	ICU Level of Service
Analysis Period (min)			15	

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
DC_Existing PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	348	43	18	134	36	27	523	39	18	530	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.97			0.99			0.99	
Flt Protected		0.99			1.00			1.00			1.00	
Satd. Flow (prot)		1762			1772			1835			1863	
Flt Permitted		0.93			0.95			0.96			0.98	
Satd. Flow (perm)		1646			1692			1772			1824	
Peak-hour factor, PHF	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. Flow (vph)	70	348	43	18	134	36	27	523	39	18	530	24
RTOR Reduction (vph)	0	4	0	0	11	0	0	3	0	0	2	0
Lane Group Flow (vph)	0	457	0	0	177	0	0	586	0	0	570	0
Confl. Peds. (#/hr)	11		11	11		11	19		7	7		19
Confl. Bikes (#/hr)			15			10			31			22
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		29.0			29.0			43.0			43.0	
Effective Green, g (s)		29.0			29.0			43.0			43.0	
Actuated g/C Ratio		0.36			0.36			0.54			0.54	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		596			613			952			980	
v/s Ratio Prot												
v/s Ratio Perm		c0.28			0.10			c0.33			0.31	
v/c Ratio		0.77			0.29			0.62			0.58	
Uniform Delay, d1		22.5			18.2			12.8			12.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		9.1			1.2			3.0			2.5	
Delay (s)		31.6			19.3			15.8			15.0	
Level of Service		C			B			B			B	
Approach Delay (s)		31.6			19.3			15.8			15.0	
Approach LOS		C			B			B			B	

Intersection Summary				
HCM 2000 Control Delay		19.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio		0.68		
Actuated Cycle Length (s)		80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization		87.5%	ICU Level of Service	E
Analysis Period (min)		15		
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
DC_Existing PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	289	20	94	38	14	18	70	899	57	20	930	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			0.99		0.99	1.00		0.99	1.00	
Frt		0.97			0.97		1.00	0.99		1.00	0.99	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1659			1692		1752	3491		1773	3486	
Flt Permitted		0.76			0.77		0.21	1.00		0.23	1.00	
Satd. Flow (perm)		1305			1339		383	3491		435	3486	
Peak-hour factor, PHF	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. Flow (vph)	289	20	94	38	14	18	70	899	57	20	930	98
RTOR Reduction (vph)	0	13	0	0	12	0	0	4	0	0	8	0
Lane Group Flow (vph)	0	390	0	0	58	0	70	952	0	20	1020	0
Confl. Peds. (#/hr)	11		26	26		11	25		17	17		25
Confl. Bikes (#/hr)			8			9			29			45
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		31.1			31.1		49.9	49.9		49.9	49.9	
Effective Green, g (s)		31.1			31.1		49.9	49.9		49.9	49.9	
Actuated g/C Ratio		0.35			0.35		0.55	0.55		0.55	0.55	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		450			462		212	1935		241	1932	
v/s Ratio Prot								0.27			c0.29	
v/s Ratio Perm		c0.30			0.04		0.18			0.05		
v/c Ratio		0.87			0.13		0.33	0.49		0.08	0.53	
Uniform Delay, d1		27.5			20.2		10.9	12.3		9.4	12.6	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		15.9			0.1		4.1	0.9		0.7	1.0	
Delay (s)		43.4			20.3		15.1	13.2		10.0	13.7	
Level of Service		D			C		B	B		B	B	
Approach Delay (s)		43.4			20.3			13.3			13.6	
Approach LOS		D			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	74.2%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
5: MLK Way & 54th Street

Children's Hospital
DC_Existing PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (veh/h)	4	5	38	14	2	8	11	32	1915	43	6	9
Sign Control		Stop			Stop				Free			
Grade		0%			0%				0%			
Peak Hour 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
Hourly flow rate (vph)	4	5	38	14	2	8	0	32	1915	43	0	9
Pedestrians		5			19				11			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		0			2				1			
Right turn flare (veh)												
Median type									None			
Median storage veh)												
Upstream signal (ft)									299			
pX, platoon unblocked	0.88	0.88	0.78	0.88	0.88	0.78	0.00	0.78			0.00	0.78
vC, conflicting volume	2237	3566	519	2589	3548	679	0	1511			0	1977
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	290	1794	0	688	1774	0	0	649			0	1281
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			0.0	4.1
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	*5.5	*5.5	*5.5	0.0	2.2			0.0	2.2
p0 queue free %	99	92	95	92	97	98	0	96			0	98
cM capacity (veh/h)	510	66	835	183	63	505	0	721			0	419

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	47	24	511	958	522	384	750	382
Volume Left	4	14	32	0	0	9	0	0
Volume Right	38	8	0	0	43	0	0	7
cSH	364	193	721	1700	1700	419	1700	1700
Volume to Capacity	0.13	0.12	0.04	0.56	0.31	0.02	0.44	0.22
Queue Length 95th (ft)	11	10	3	0	0	2	0	0
Control Delay (s)	16.4	26.3	1.2	0.0	0.0	0.7	0.0	0.0
Lane LOS	C	D	A			A		
Approach Delay (s)	16.4	26.3	0.3			0.2		
Approach LOS	C	D						

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	82.1%	ICU Level of Service	E	
Analysis Period (min)	15			

* User Entered Value

Movement	SBT	SBR
Lane Configurations		
Volume (veh/h)	1499	7
Sign Control	Free	
Grade	0%	
Peak Hour Factor	1.00	1.00
Hourly flow rate (vph)	1499	7
Pedestrians		
Lane Width (ft)		
Walking Speed (ft/s)		
Percent Blockage		
Right turn flare (veh)		
Median type	None	
Median storage veh)		
Upstream signal (ft)	294	
pX, platoon unblocked		
vC, conflicting volume		
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol		
tC, single (s)		
tC, 2 stage (s)		
tF (s)		
p0 queue free %		
cM capacity (veh/h)		

Direction, Lane #

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	38	4	2	5	11	8	31	4	7	17	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	8	38	4	2	5	11	8	31	4	7	17	2
Pedestrians		12			8			6			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	110	103	36	118	102	44	31			43		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	110	103	36	118	102	44	31			43		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	95	100	100	99	99	99			100		
cM capacity (veh/h)	832	770	1027	801	771	1022	1579			1568		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	50	18	43	26
Volume Left	8	2	8	7
Volume Right	4	11	4	2
cSH	796	912	1579	1568
Volume to Capacity	0.06	0.02	0.01	0.00
Queue Length 95th (ft)	5	2	0	0
Control Delay (s)	9.8	9.0	1.4	2.0
Lane LOS	A	A	A	A
Approach Delay (s)	9.8	9.0	1.4	2.0
Approach LOS	A	A		

Intersection Summary				
Average Delay	5.6			
Intersection Capacity Utilization	19.1%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
7: Shattuck Ave & 54th Street

Children's Hospital
DC_Existing PM Plus Phase 2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	3	42	11	607	616	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	3	42	11	607	616	3
Pedestrians	25				1	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	2				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.83	0.79	0.79			
vC, conflicting volume	1272	642	644			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1012	419	421			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	92	99			
cM capacity (veh/h)	215	496	884			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	45	618	619
Volume Left	3	11	0
Volume Right	42	0	3
cSH	456	884	1700
Volume to Capacity	0.10	0.01	0.36
Queue Length 95th (ft)	8	1	0
Control Delay (s)	13.8	0.3	0.0
Lane LOS	B	A	
Approach Delay (s)	13.8	0.3	0.0
Approach LOS	B		

Intersection Summary				
Average Delay		0.6		
Intersection Capacity Utilization		50.8%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
8: MLK Way & 53rd Street

Children's Hospital
DC_Existing PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	2	3	52	46	6	4	7	9	2004	68	2	1584
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.88			0.99			1.00	1.00		1.00	1.00
Flt Protected		1.00			0.96			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1600			1801			1770	5041		1787	5133
Flt Permitted		0.99			0.74			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1592			1391			1770	5041		1787	5133
Peak-hour factor, PHF	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. Flow (vph)	2	3	52	46	6	4	7	9	2004	68	2	1584
RTOR Reduction (vph)	0	43	0	0	3	0	0	0	2	0	0	0
Lane Group Flow (vph)	0	14	0	0	53	0	0	16	2070	0	2	1588
Confl. Peds. (#/hr)	8		4	4		8		14		32	32	
Confl. Bikes (#/hr)			4			2				13		
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		16.4			16.4			3.0	69.3		1.8	68.1
Effective Green, g (s)		16.4			16.4			3.0	69.3		1.8	68.1
Actuated g/C Ratio		0.16			0.16			0.03	0.69		0.02	0.68
Clearance Time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		261			228			53	3493		32	3495
v/s Ratio Prot								0.01	c0.41		0.00	c0.31
v/s Ratio Perm		0.01			c0.04							
v/c Ratio		0.05			0.23			0.30	0.59		0.06	0.45
Uniform Delay, d1		35.2			36.3			47.5	8.0		48.3	7.4
Progression Factor		1.00			1.03			1.41	0.21		0.78	0.47
Incremental Delay, d2		0.1			0.5			2.3	0.5		0.6	0.3
Delay (s)		35.3			37.8			69.3	2.2		38.5	3.8
Level of Service		D			D			E	A		D	A
Approach Delay (s)		35.3			37.8				2.7			3.8
Approach LOS		D			D				A			A

Intersection Summary				
HCM 2000 Control Delay	4.2	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5	
Intersection Capacity Utilization	63.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	4
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	4
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	14
Confl. Bikes (#/hr)	16
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	41	8	0	0	6	5	0	0	0	1	0	28
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	41	8	0	0	6	5	0	0	0	1	0	28
Pedestrians		25			10			4			4	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			1			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	53	51	43	34	65	14	53			10		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	53	51	43	34	65	14	53			10		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	99	100	100	99	100	100			100		
cM capacity (veh/h)	897	819	1008	938	805	1059	1533			1609		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	49	11	0	29
Volume Left	41	0	0	1
Volume Right	0	5	0	28
cSH	884	904	1700	1609
Volume to Capacity	0.06	0.01	0.00	0.00
Queue Length 95th (ft)	4	1	0	0
Control Delay (s)	9.3	9.0	0.0	0.3
Lane LOS	A	A		A
Approach Delay (s)	9.3	9.0	0.0	0.3
Approach LOS	A	A		

Intersection Summary					
Average Delay	6.3				
Intersection Capacity Utilization	25.8%	ICU Level of Service		A	
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	76	108	95	147	85	249	42	74	1685	102	4	183
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.96			1.00	0.97		1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00			0.97	1.00		1.00	1.00			1.00
Frt	1.00	0.93			1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00			0.97	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1769	1686			1758	1535		1787	5075			1787
Flt Permitted	0.47	1.00			0.57	1.00		0.95	1.00			0.95
Satd. Flow (perm)	880	1686			1041	1535		1787	5075			1787
Peak-hour factor, PHF	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. Flow (vph)	76	108	95	147	85	249	42	74	1685	102	4	183
RTOR Reduction (vph)	0	34	0	0	0	185	0	0	6	0	0	0
Lane Group Flow (vph)	76	169	0	0	232	64	0	116	1781	0	0	187
Confl. Peds. (#/hr)	16		61	61		16		13		10		10
Confl. Bikes (#/hr)			9			4				15		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	25.9	25.9			25.9	25.9		10.8	43.1			17.5
Effective Green, g (s)	25.9	25.9			25.9	25.9		10.8	43.1			17.5
Actuated g/C Ratio	0.26	0.26			0.26	0.26		0.11	0.43			0.18
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	227	436			269	397		192	2187			312
v/s Ratio Prot		0.10						0.06	c0.35			0.10
v/s Ratio Perm	0.09				c0.22	0.04						
v/c Ratio	0.33	0.39			0.86	0.16		0.60	0.81			0.60
Uniform Delay, d1	30.1	30.5			35.4	28.7		42.6	24.9			38.0
Progression Factor	1.00	1.00			0.79	2.03		0.97	1.06			0.61
Incremental Delay, d2	0.3	0.2			21.1	0.1		1.5	1.5			1.9
Delay (s)	30.4	30.7			49.2	58.2		42.9	27.9			25.3
Level of Service	C	C			D	E		D	C			C
Approach Delay (s)		30.6			53.9				28.8			
Approach LOS		C			D				C			

Intersection Summary			
HCM 2000 Control Delay	23.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	105.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: MLK Way & 52nd Street

Children's Hospital
DC_Existing PM Plus Phase 2

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1508	3
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5133	
Flt Permitted	1.00	
Satd. Flow (perm)	5133	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1508	3
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1511	0
Confl. Peds. (#/hr)		13
Confl. Bikes (#/hr)		17
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	49.3	
Effective Green, g (s)	49.3	
Actuated g/C Ratio	0.49	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2530	
v/s Ratio Prot	c0.29	
v/s Ratio Perm		
v/c Ratio	0.60	
Uniform Delay, d1	18.2	
Progression Factor	0.27	
Incremental Delay, d2	1.0	
Delay (s)	5.9	
Level of Service	A	
Approach Delay (s)	8.1	
Approach LOS	A	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	390	4	3	416	2	12	1	7	0	4	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.95			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.95			0.87	
Flt Protected		1.00			1.00			0.97			1.00	
Satd. Flow (prot)		1857			1897			1438			1640	
Flt Permitted		1.00			1.00			0.92			1.00	
Satd. Flow (perm)		1854			1894			1359			1640	
Peak-hour factor, PHF	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. Flow (vph)	3	390	4	3	416	2	12	1	7	0	4	59
RTOR Reduction (vph)	0	1	0	0	1	0	0	4	0	0	32	0
Lane Group Flow (vph)	0	396	0	0	420	0	0	16	0	0	31	0
Confl. Peds. (#/hr)	25		59	59		25			208	208		
Confl. Bikes (#/hr)			10			6						1
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		21.0			21.0			23.0			23.0	
Effective Green, g (s)		21.0			21.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.42			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		778			795			625			754	
v/s Ratio Prot											c0.02	
v/s Ratio Perm		0.21			c0.22			0.01				
v/c Ratio		0.51			0.53			0.03			0.04	
Uniform Delay, d1		10.7			10.8			7.4			7.4	
Progression Factor		1.70			1.00			1.00			1.00	
Incremental Delay, d2		1.9			2.5			0.1			0.1	
Delay (s)		20.1			13.3			7.5			7.5	
Level of Service		C			B			A			A	
Approach Delay (s)		20.1			13.3			7.5			7.5	
Approach LOS		C			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.27			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	6.0	
Intersection Capacity Utilization	49.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	341	46	21	344	4	72	0	50	10	0	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	8	341	46	21	344	4	72	0	50	10	0	14
Pedestrians		37			7			35			15	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			1			3			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.90			0.84			0.89	0.89	0.84	0.89	0.89	0.90
vC, conflicting volume	363			422			854	820	406	840	841	398
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	233			221			519	481	202	504	505	272
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	99			98			80	100	92	97	100	98
cM capacity (veh/h)	1177			1108			356	395	666	371	395	663

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	395	369	122	24
Volume Left	8	21	72	10
Volume Right	46	4	50	14
cSH	1177	1108	440	499
Volume to Capacity	0.01	0.02	0.28	0.05
Queue Length 95th (ft)	1	1	28	4
Control Delay (s)	0.2	0.7	16.3	12.6
Lane LOS	A	A	C	B
Approach Delay (s)	0.2	0.7	16.3	12.6
Approach LOS			C	B

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	47.4%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
13: SR-24 NB Off-Ramp & 52nd Street

Children's Hospital
DC_Existing PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	396	0	0	376	1003	0	1024	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	396	0	0	376	1003	0	1024	0	0
Pedestrians							33		9	
Lane Width (ft)							12.0		0.0	
Walking Speed (ft/s)							4.0		4.0	
Percent Blockage							3		0	
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.83						0.83		0.83	0.83
vC, conflicting volume	1388			429			1817	231	1607	814
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1067			429			1582	231	1330	379
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	541			1096			87	747	0	447

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	198	198	251	460	669	512	512
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	334	669	512	512
cSH	1700	1700	1700	1700	1700	747	747
Volume to Capacity	0.12	0.12	0.15	0.27	0.39	0.69	0.69
Queue Length 95th (ft)	0	0	0	0	0	138	138
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	19.6	19.6
Lane LOS						C	C
Approach Delay (s)	0.0		0.0			19.6	
Approach LOS						C	

Intersection Summary				
Average Delay	7.2			
Intersection Capacity Utilization	55.0%	ICU Level of Service		B
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
14: 52nd Street & Shattuck Ave

Children's Hospital
DC_Existing PM Plus Phase 2

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	40	308	880	172	35	839	129	146	207	40	161	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.99		1.00	0.99		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			0.99
Frt		1.00	0.98		1.00	0.98		1.00	0.98			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.97
Satd. Flow (prot)		1787	4950		1805	5038		1748	1783			1712
Flt Permitted		0.95	1.00		0.95	1.00		0.27	1.00			0.71
Satd. Flow (perm)		1787	4950		1805	5038		493	1783			1243
Peak-hour factor, PHF	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. Flow (vph)	40	308	880	172	35	839	129	146	207	40	161	143
RTOR Reduction (vph)	0	0	24	0	0	18	0	0	6	0	0	0
Lane Group Flow (vph)	0	348	1028	0	35	950	0	146	241	0	0	304
Confl. Peds. (#/hr)		11		14	14		11	18		22	22	
Confl. Bikes (#/hr)				13			8			30		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		33.5	57.2		3.9	27.6		34.9	34.9			25.4
Effective Green, g (s)		33.5	57.2		3.9	27.6		34.9	34.9			25.4
Actuated g/C Ratio		0.30	0.52		0.04	0.25		0.32	0.32			0.23
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		544	2574		63	1264		219	565			287
v/s Ratio Prot		c0.19	0.21		0.02	c0.19		c0.03	0.14			
v/s Ratio Perm								0.18				c0.24
v/c Ratio		0.64	0.40		0.56	0.75		0.67	0.43			1.06
Uniform Delay, d1		33.0	16.0		52.2	38.0		31.8	29.6			42.3
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Incremental Delay, d2		5.7	0.5		10.2	4.2		7.5	2.3			69.6
Delay (s)		38.7	16.5		62.4	42.2		39.2	32.0			111.9
Level of Service		D	B		E	D		D	C			F
Approach Delay (s)			22.0			42.9			34.7			71.2
Approach LOS			C			D			C			E

Intersection Summary				
HCM 2000 Control Delay	38.9	HCM 2000 Level of Service		D
HCM 2000 Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		18.0
Intersection Capacity Utilization	101.0%	ICU Level of Service		G
Analysis Period (min)	15			

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	355
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.94
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1421
Flt Permitted	1.00
Satd. Flow (perm)	1421
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	355
RTOR Reduction (vph)	273
Lane Group Flow (vph)	82
Confl. Peds. (#/hr)	18
Confl. Bikes (#/hr)	27
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	25.4
Effective Green, g (s)	25.4
Actuated g/C Ratio	0.23
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	328
v/s Ratio Prot	
v/s Ratio Perm	0.06
v/c Ratio	0.25
Uniform Delay, d1	34.5
Progression Factor	1.00
Incremental Delay, d2	1.8
Delay (s)	36.3
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	13	7	13	99	72	157	14	861	224	101	667	286
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.95			0.99		1.00	0.93	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.95		1.00	0.90			0.97		1.00	0.95	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1623		1698	1532			3797		1770	3144	
Flt Permitted		0.98		0.95	1.00			0.94		0.95	1.00	
Satd. Flow (perm)		1623		1698	1532			3564		1770	3144	
Peak-hour factor, PHF	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. Flow (vph)	13	7	13	99	72	157	14	861	224	101	667	286
RTOR Reduction (vph)	0	12	0	0	74	0	0	18	0	0	37	0
Lane Group Flow (vph)	0	21	0	89	165	0	0	1081	0	101	916	0
Confl. Peds. (#/hr)	34					34	70		22	22		70
Confl. Bikes (#/hr)			1			10			35			48
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		4.6		16.9	16.9			51.2		9.3	65.0	
Effective Green, g (s)		4.6		16.9	16.9			51.2		9.3	65.0	
Actuated g/C Ratio		0.05		0.17	0.17			0.51		0.09	0.65	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		74		286	258			1824		164	2043	
v/s Ratio Prot		c0.01		0.05	c0.11					c0.06	0.29	
v/s Ratio Perm								c0.30				
v/c Ratio		0.28		0.31	0.64			0.59		0.62	0.45	
Uniform Delay, d1		46.1		36.4	38.7			17.1		43.6	8.6	
Progression Factor		1.87		1.00	1.00			0.60		1.00	1.00	
Incremental Delay, d2		1.2		0.6	5.1			1.1		6.7	0.7	
Delay (s)		87.3		37.1	43.9			11.4		50.3	9.4	
Level of Service		F		D	D			B		D	A	
Approach Delay (s)		87.3			42.0			11.4			13.3	
Approach LOS		F			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
16: Telegraph Ave & 51St Street

Children's Hospital
DC_Existing PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	324	611	92	56	478	229	81	574	97	262	476	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.97		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3396		1787	3314		1719	3311		1752	3401	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3396		1787	3314		1719	3311		1752	3401	
Peak-hour factor, PHF	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. Flow (vph)	324	611	92	56	478	229	81	574	97	262	476	44
RTOR Reduction (vph)	0	11	0	0	57	0	0	13	0	0	7	0
Lane Group Flow (vph)	324	692	0	56	650	0	81	658	0	262	513	0
Confl. Peds. (#/hr)	38		52	52		38	92		57	57		92
Confl. Bikes (#/hr)			8			15			34			54
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.4	29.8		7.4	23.3		7.5	33.3		13.0	39.8	
Effective Green, g (s)	14.4	29.8		7.4	23.3		7.5	33.3		13.0	39.8	
Actuated g/C Ratio	0.14	0.30		0.07	0.23		0.08	0.33		0.13	0.40	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	489	1012		132	772		128	1102		227	1353	
v/s Ratio Prot	c0.10	0.20		0.03	c0.20		0.05	c0.20		c0.15	0.15	
v/s Ratio Perm												
v/c Ratio	0.66	0.68		0.42	0.84		0.63	0.60		1.15	0.38	
Uniform Delay, d1	40.5	30.9		44.3	36.6		44.9	27.8		43.5	21.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.18	0.74	
Incremental Delay, d2	3.4	3.7		2.2	10.8		9.8	2.4		105.5	0.8	
Delay (s)	43.9	34.7		46.5	47.4		54.7	30.1		156.6	16.6	
Level of Service	D	C		D	D		D	C		F	B	
Approach Delay (s)		37.6			47.3			32.8			63.5	
Approach LOS		D			D			C			E	

Intersection Summary				
HCM 2000 Control Delay	44.8	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	78.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
17: SB SR-24 On-Ramp & MLK Way & NB SR-24 Off-Ramp

Children's Hospital
DC_Existing PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	269	0	0	0	0	1626	0	0	0	0	1581	238
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	269	0	0	0	0	1626	0	0	0	0	1581	238
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	269	0	0	0	0	1626	0	0	0	0	1581	238
Confl. Peds. (#/hr)			2	2			18					18
Confl. Bikes (#/hr)									9			12
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	13.0					50.0					29.0	50.0
Effective Green, g (s)	13.0					50.0					29.0	50.0
Actuated g/C Ratio	0.26					1.00					0.58	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	850					1627					2072	2814
v/s Ratio Prot	0.08										0.44	0.08
v/s Ratio Perm						c1.00						
v/c Ratio	0.32					1.00					0.76	0.08
Uniform Delay, d1	14.9					0.0					7.9	0.0
Progression Factor	1.00					1.00					2.66	1.00
Incremental Delay, d2	1.0					22.2					2.2	0.0
Delay (s)	15.9					22.2					23.3	0.0
Level of Service	B					C					C	A
Approach Delay (s)		15.9			22.2			0.0			20.3	
Approach LOS		B			C			A			C	

Intersection Summary				
HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	1.19			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	58.0%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	113	8	83	97	0	43	0	134	6	52	4
Peak Hour 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
Hourly flow rate (vph)	0	113	8	83	97	0	43	0	134	6	52	4

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	121	180	43	134	62
Volume Left (vph)	0	83	43	0	6
Volume Right (vph)	8	0	0	134	4
Hadj (s)	-0.02	0.13	0.50	-0.70	0.01
Departure Headway (s)	4.7	4.8	5.8	4.6	5.0
Degree Utilization, x	0.16	0.24	0.07	0.17	0.09
Capacity (veh/h)	716	715	587	733	665
Control Delay (s)	8.6	9.2	8.0	7.4	8.5
Approach Delay (s)	8.6	9.2	7.5		8.5
Approach LOS	A	A	A		A

Intersection Summary					
Delay			8.4		
Level of Service			A		
Intersection Capacity Utilization			40.2%	ICU Level of Service	A
Analysis Period (min)			15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	1	111	2	2	100	36	2	0	3	11	0	3
Peak Hour 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
Hourly flow rate (vph)	1	111	2	2	100	36	2	0	3	11	0	3

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	114	138	5	14
Volume Left (vph)	1	2	2	11
Volume Right (vph)	2	36	3	3
Hadj (s)	0.01	-0.15	-0.28	0.03
Departure Headway (s)	4.1	3.9	4.2	4.5
Degree Utilization, x	0.13	0.15	0.01	0.02
Capacity (veh/h)	869	911	806	751
Control Delay (s)	7.7	7.6	7.2	7.5
Approach Delay (s)	7.7	7.6	7.2	7.5
Approach LOS	A	A	A	A

Intersection Summary					
Delay			7.6		
Level of Service			A		
Intersection Capacity Utilization			20.4%	ICU Level of Service	A
Analysis Period (min)			15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	12	370	1	10	339	29	8	18	29	27	3	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	12	370	1	10	339	29	8	18	29	27	3	10
Pedestrians		5						7			3	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	371			378			792	792	378	809	778	362
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	371			378			792	792	378	809	778	362
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			97	94	96	90	99	99
cM capacity (veh/h)	1190			1185			294	315	670	267	319	679

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	383	378	55	40
Volume Left	12	10	8	27
Volume Right	1	29	29	10
cSH	1190	1185	431	320
Volume to Capacity	0.01	0.01	0.13	0.13
Queue Length 95th (ft)	1	1	11	11
Control Delay (s)	0.4	0.3	14.6	17.9
Lane LOS	A	A	B	C
Approach Delay (s)	0.4	0.3	14.6	17.9
Approach LOS			B	C

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	40.3%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	123	1980	34	0	1689
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	123	1980	34	0	1689
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			154			137
pX, platoon unblocked	0.76	0.69			0.69	
vC, conflicting volume	2560	677			2014	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	694	0			909	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	84			100	
cM capacity (veh/h)	288	751			516	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	123	792	792	430	563	563	563
Volume Left	0	0	0	0	0	0	0
Volume Right	123	0	0	34	0	0	0
cSH	751	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.16	0.47	0.47	0.25	0.33	0.33	0.33
Queue Length 95th (ft)	15	0	0	0	0	0	0
Control Delay (s)	10.7	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	10.7	0.0			0.0		
Approach LOS	B						

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	53.3%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	1895	0	0	1792
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	1895	0	0	1792
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			424			204
pX, platoon unblocked	0.79					
vC, conflicting volume	2492	632			1895	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1954	632			1895	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	44	423			311	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	0	758	758	379	597	597	597
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.45	0.45	0.22	0.35	0.35	0.35
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	0.0	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	39.9%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	20	180	230	60	240	80	21	150	1381	72	90	1332
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			0.99			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.93			0.97			1.00	0.99		1.00	0.99
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1703			1747			1770	5027		1770	5046
Flt Permitted		0.98			0.77			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1664			1360			1770	5027		1770	5046
Peak-hour factor, PHF	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. Flow (vph)	20	180	230	60	240	80	21	150	1381	72	90	1332
RTOR Reduction (vph)	0	52	0	0	12	0	0	0	5	0	0	4
Lane Group Flow (vph)	0	378	0	0	368	0	0	171	1448	0	90	1378
Confl. Peds. (#/hr)	10		19	19		10				28		
Confl. Bikes (#/hr)			21			20				8		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		27.7			27.7			14.4	41.8		6.0	33.4
Effective Green, g (s)		27.7			27.7			14.4	41.8		6.0	33.4
Actuated g/C Ratio		0.31			0.31			0.16	0.46		0.07	0.37
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		512			418			283	2334		118	1872
v/s Ratio Prot								0.10	c0.29		0.05	c0.27
v/s Ratio Perm		0.23			c0.27							
v/c Ratio		0.74			0.88			0.60	0.62		0.76	0.74
Uniform Delay, d1		27.9			29.6			35.2	18.1		41.3	24.5
Progression Factor		1.00			1.00			0.55	0.26		1.00	1.00
Incremental Delay, d2		5.5			19.0			3.3	1.1		24.8	2.6
Delay (s)		33.4			48.6			22.7	5.8		66.1	27.1
Level of Service		C			D			C	A		E	C
Approach Delay (s)		33.4			48.6				7.6			29.5
Approach LOS		C			D				A			C

Intersection Summary			
HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	90.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: MLK Way & 55th Street

Children's Hospital
DC_2020 AM Plus Phase 1

Movement	SBR
Lane Configurations	
Volume (vph)	50
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	50
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	16
Confl. Bikes (#/hr)	10
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis
2: Dover Street & 55th Street

Children's Hospital
DC_2020 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	302	10	30	320	10	10	10	20	10	10	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	302	10	30	320	10	10	10	20	10	10	30
Pedestrians		12			26			20			8	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			2			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked	0.89						0.89	0.89		0.89	0.89	0.89
vC, conflicting volume	338			332			819	785	353	811	785	345
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	196			332			736	698	353	727	698	204
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			97			96	97	97	96	97	96
cM capacity (veh/h)	1203			1196			259	304	669	262	301	731

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	342	360	40	50
Volume Left	30	30	10	10
Volume Right	10	10	20	30
cSH	1203	1196	394	445
Volume to Capacity	0.02	0.03	0.10	0.11
Queue Length 95th (ft)	2	2	8	9
Control Delay (s)	0.9	0.9	15.2	14.1
Lane LOS	A	A	C	B
Approach Delay (s)	0.9	0.9	15.2	14.1
Approach LOS			C	B

Intersection Summary				
Average Delay			2.5	
Intersection Capacity Utilization			41.1%	ICU Level of Service
Analysis Period (min)			15	

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
DC_2020 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	232	60	30	270	50	40	460	30	30	570	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.99			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.99			0.99	
Flt Protected		0.99			1.00			1.00			1.00	
Satd. Flow (prot)		1727			1787			1836			1855	
Flt Permitted		0.86			0.96			0.93			0.96	
Satd. Flow (perm)		1493			1719			1710			1792	
Peak-hour factor, PHF	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. Flow (vph)	60	232	60	30	270	50	40	460	30	30	570	40
RTOR Reduction (vph)	0	9	0	0	8	0	0	3	0	0	3	0
Lane Group Flow (vph)	0	343	0	0	342	0	0	527	0	0	637	0
Confl. Peds. (#/hr)	8		17	17		8	10		23	23		10
Confl. Bikes (#/hr)			29			13			17			32
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		25.0			25.0			47.0			47.0	
Effective Green, g (s)		25.0			25.0			47.0			47.0	
Actuated g/C Ratio		0.31			0.31			0.59			0.59	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		466			537			1004			1052	
v/s Ratio Prot												
v/s Ratio Perm		c0.23			0.20			0.31			c0.36	
v/c Ratio		0.74			0.64			0.53			0.61	
Uniform Delay, d1		24.6			23.6			9.8			10.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		9.9			5.7			2.0			2.6	
Delay (s)		34.5			29.3			11.8			13.2	
Level of Service		C			C			B			B	
Approach Delay (s)		34.5			29.3			11.8			13.2	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM 2000 Control Delay		19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio		0.65		
Actuated Cycle Length (s)		80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization		80.8%	ICU Level of Service	D
Analysis Period (min)		15		
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
DC_2020 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	162	20	90	40	10	10	70	842	50	40	984	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	0.99		1.00	0.98	
Flpb, ped/bikes		1.00			0.99		1.00	1.00		0.99	1.00	
Frt		0.96			0.98		1.00	0.99		1.00	0.97	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1649			1709		1762	3491		1767	3409	
Flt Permitted		0.78			0.76		0.17	1.00		0.28	1.00	
Satd. Flow (perm)		1329			1338		310	3491		523	3409	
Peak-hour factor, PHF	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. Flow (vph)	162	20	90	40	10	10	70	842	50	40	984	260
RTOR Reduction (vph)	0	30	0	0	7	0	0	5	0	0	27	0
Lane Group Flow (vph)	0	242	0	0	53	0	70	887	0	40	1217	0
Confl. Peds. (#/hr)	8		15	15		8	17		23	23		17
Confl. Bikes (#/hr)			20			20			56			36
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		18.1			18.1		42.9	42.9		42.9	42.9	
Effective Green, g (s)		18.1			18.1		42.9	42.9		42.9	42.9	
Actuated g/C Ratio		0.26			0.26		0.61	0.61		0.61	0.61	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		343			345		189	2139		320	2089	
v/s Ratio Prot								0.25			c0.36	
v/s Ratio Perm		c0.18			0.04		0.23			0.08		
v/c Ratio		0.71			0.15		0.37	0.41		0.12	0.58	
Uniform Delay, d1		23.5			20.0		6.8	7.0		5.7	8.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		6.5			0.2		5.5	0.6		0.8	1.2	
Delay (s)		30.0			20.2		12.3	7.6		6.5	9.4	
Level of Service		C			C		B	A		A	A	
Approach Delay (s)		30.0			20.2			8.0			9.3	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	69.4%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
5: MLK Way & 54th Street

Children's Hospital
DC_2020 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	10	10	50	10	10	10	11	20	1572	26	20	1593
Sign Control		Stop			Stop				Free			Free
Grade		0%			0%				0%			0%
Peak Hour 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
Hourly flow rate (vph)	10	10	50	10	10	10	0	20	1572	26	20	1593
Pedestrians		10			8				11			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		1			1				1			
Right turn flare (veh)												
Median type									None			None
Median storage veh)												
Upstream signal (ft)									299			294
pX, platoon unblocked	0.85	0.85	0.77	0.85	0.85	0.83	0.00	0.77			0.83	
vC, conflicting volume	2227	3294	557	2270	3286	545	0	1613			1606	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	486	1734	0	536	1725	0	0	746			1007	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			4.1	
tC, 2 stage (s)												
tF (s)	*5.0	*5.0	*5.0	*4.5	*4.5	*4.5	0.0	2.2			2.2	
p0 queue free %	96	85	91	96	85	98	0	97			96	
cM capacity (veh/h)	251	66	544	228	68	658	0	654			568	

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	70	30	413	786	419	418	796	408
Volume Left	10	10	20	0	0	20	0	0
Volume Right	50	10	0	0	26	0	0	10
cSH	246	146	654	1700	1700	568	1700	1700
Volume to Capacity	0.28	0.21	0.03	0.46	0.25	0.04	0.47	0.24
Queue Length 95th (ft)	28	18	2	0	0	3	0	0
Control Delay (s)	25.3	35.9	0.9	0.0	0.0	1.1	0.0	0.0
Lane LOS	D	E	A			A		
Approach Delay (s)	25.3	35.9	0.2			0.3		
Approach LOS	D	E						

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	67.4%	ICU Level of Service	C	
Analysis Period (min)	15			

* User Entered Value

Movement	SBR
Lane Configurations	
Volume (veh/h)	10
Sign Control	
Grade	
Peak Hour Factor	1.00
Hourly flow rate (vph)	10
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	
tC, single (s)	
tC, 2 stage (s)	
tF (s)	
p0 queue free %	
cM capacity (veh/h)	

Direction, Lane #

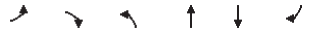
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	16	10	10	10	10	10	20	20	10	40	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	16	10	10	10	10	10	20	20	10	40	10
Pedestrians		13			19			3			8	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	151	157	61	155	152	57	63			59		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	151	157	61	155	152	57	63			59		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	98	99	99	99	99	99			99		
cM capacity (veh/h)	767	710	996	756	714	992	1536			1533		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	36	30	50	60
Volume Left	10	10	10	10
Volume Right	10	10	20	10
cSH	789	804	1536	1533
Volume to Capacity	0.05	0.04	0.01	0.01
Queue Length 95th (ft)	4	3	0	0
Control Delay (s)	9.8	9.6	1.5	1.3
Lane LOS	A	A	A	A
Approach Delay (s)	9.8	9.6	1.5	1.3
Approach LOS	A	A		

Intersection Summary				
Average Delay	4.5			
Intersection Capacity Utilization	21.1%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
7: Shattuck Ave & 54th Street

Children's Hospital
DC_2020 AM Plus Phase 1



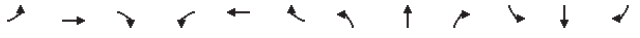
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	26	20	520	630	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	26	20	520	630	10
Pedestrians	12			3	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.79	0.79	0.79			
vC, conflicting volume	1209	650	652			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1118	419	422			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	95	98			
cM capacity (veh/h)	176	496	886			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	36	540	640
Volume Left	10	20	0
Volume Right	26	0	10
cSH	330	886	1700
Volume to Capacity	0.11	0.02	0.38
Queue Length 95th (ft)	9	2	0
Control Delay (s)	17.3	0.6	0.0
Lane LOS	C	A	
Approach Delay (s)	17.3	0.6	0.0
Approach LOS	C		

Intersection Summary				
Average Delay		0.8		
Intersection Capacity Utilization		54.5%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
8: MLK Way & 53rd Street

Children's Hospital
DC_2020 AM Plus Phase 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	1	49	60	10	18	30	1611	93	4	1675	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.98			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Frt		0.89			0.97		1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1611			1767		1770	5025		1787	5128	
Flt Permitted		0.95			0.77		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1548			1400		1770	5025		1787	5128	
Peak-hour factor, PHF	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. Flow (vph)	10	1	49	60	10	18	30	1611	93	4	1675	10
RTOR Reduction (vph)	0	40	0	0	13	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	20	0	0	75	0	30	1700	0	4	1685	0
Confl. Peds. (#/hr)	10		17	17		10			17			26
Confl. Bikes (#/hr)									7			17
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		16.7			16.7		4.5	59.0		1.8	56.3	
Effective Green, g (s)		16.7			16.7		4.5	59.0		1.8	56.3	
Actuated g/C Ratio		0.19			0.19		0.05	0.66		0.02	0.63	
Clearance Time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		287			259		88	3294		35	3207	
v/s Ratio Prot							0.02	c0.34		0.00	c0.33	
v/s Ratio Perm		0.01			c0.05							
v/c Ratio		0.07			0.29		0.34	0.52		0.11	0.53	
Uniform Delay, d1		30.2			31.5		41.3	8.1		43.3	9.4	
Progression Factor		1.00			1.00		1.17	0.56		0.52	0.26	
Incremental Delay, d2		0.1			0.6		1.8	0.5		1.1	0.5	
Delay (s)		30.3			32.2		50.1	5.0		23.6	2.9	
Level of Service		C			C		D	A		C	A	
Approach Delay (s)		30.3			32.2			5.8			3.0	
Approach LOS		C			C			A			A	

Intersection Summary					
HCM 2000 Control Delay		5.5	HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio		0.49			
Actuated Cycle Length (s)		90.0	Sum of lost time (s)		12.5
Intersection Capacity Utilization		58.7%	ICU Level of Service		B
Analysis Period (min)		15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
9: Dover Street & 53rd Street

Children's Hospital
DC_2020 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	50	30	0	0	20	10	0	0	0	10	0	50
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	50	30	0	0	20	10	0	0	0	10	0	50
Pedestrians		29			28			3			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			2			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	97	102	57	91	127	31	79			28		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	97	102	57	91	127	31	79			28		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	96	100	100	97	99	100			99		
cM capacity (veh/h)	806	750	988	814	727	1022	1495			1561		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	80	30	0	60
Volume Left	50	0	0	10
Volume Right	0	10	0	50
cSH	784	804	1700	1561
Volume to Capacity	0.10	0.04	0.00	0.01
Queue Length 95th (ft)	8	3	0	0
Control Delay (s)	10.1	9.7	0.0	1.3
Lane LOS	B	A		A
Approach Delay (s)	10.1	9.7	0.0	1.3
Approach LOS	B	A		

Intersection Summary				
Average Delay	6.9			
Intersection Capacity Utilization	28.4%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
10: MLK Way & 52nd Street

Children's Hospital
DC_2020 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	59	81	110	74	83	282	60	80	1541	45	36	153
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.96			1.00	0.97		1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00			0.98	1.00		1.00	1.00			1.00
Frt	1.00	0.91			1.00	0.85		1.00	1.00			1.00
Flt Protected	0.95	1.00			0.98	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1771	1646			1785	1537		1787	5110			1787
Flt Permitted	0.62	1.00			0.71	1.00		0.95	1.00			0.95
Satd. Flow (perm)	1147	1646			1306	1537		1787	5110			1787
Peak-hour factor, PHF	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. Flow (vph)	59	81	110	74	83	282	60	80	1541	45	36	153
RTOR Reduction (vph)	0	62	0	0	0	176	0	0	3	0	0	0
Lane Group Flow (vph)	59	129	0	0	157	107	0	140	1583	0	0	189
Confl. Peds. (#/hr)	13		64	64		13				10		
Confl. Bikes (#/hr)			8			7				2		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	22.5	22.5			22.5	22.5		7.5	41.5			12.5
Effective Green, g (s)	22.5	22.5			22.5	22.5		7.5	41.5			12.5
Actuated g/C Ratio	0.25	0.25			0.25	0.25		0.08	0.46			0.14
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	286	411			326	384		148	2356			248
v/s Ratio Prot		0.08						c0.08	c0.31			c0.11
v/s Ratio Perm	0.05				c0.12	0.07						
v/c Ratio	0.21	0.31			0.48	0.28		0.95	0.67			0.76
Uniform Delay, d1	26.7	27.5			28.8	27.2		41.0	18.9			37.3
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.07			0.79
Incremental Delay, d2	0.1	0.2			0.4	0.1		34.6	0.7			10.6
Delay (s)	26.8	27.6			29.2	27.3		75.4	21.0			39.9
Level of Service	C	C			C	C		E	C			D
Approach Delay (s)		27.4			28.0				25.4			
Approach LOS		C			C				C			

Intersection Summary				
HCM 2000 Control Delay	21.8	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		14.0
Intersection Capacity Utilization	102.3%	ICU Level of Service		G
Analysis Period (min)	15			

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1578	7
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5131	
Flt Permitted	1.00	
Satd. Flow (perm)	5131	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1578	7
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1585	0
Confl. Peds. (#/hr)		13
Confl. Bikes (#/hr)		13
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	46.0	
Effective Green, g (s)	46.0	
Actuated g/C Ratio	0.51	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2622	
v/s Ratio Prot	0.31	
v/s Ratio Perm		
v/c Ratio	0.60	
Uniform Delay, d1	15.6	
Progression Factor	0.79	
Incremental Delay, d2	0.9	
Delay (s)	13.2	
Level of Service	B	
Approach Delay (s)	16.1	
Approach LOS	B	

Intersection Summary			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	246	9	5	397	2	15	7	10	0	2	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		0.99			1.00			0.94			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			1.00			0.96			0.88	
Flt Protected		1.00			1.00			0.98			1.00	
Satd. Flow (prot)		3498			3600			1447			1655	
Flt Permitted		0.95			0.95			0.94			1.00	
Satd. Flow (perm)		3340			3429			1386			1655	
Peak-hour factor, PHF	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. Flow (vph)	4	246	9	5	397	2	15	7	10	0	2	15
RTOR Reduction (vph)	0	5	0	0	1	0	0	5	0	0	8	0
Lane Group Flow (vph)	0	254	0	0	403	0	0	27	0	0	9	0
Confl. Peds. (#/hr)	23		72	72		23			263	263		
Confl. Bikes (#/hr)			8			7						2
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Prot	NA		Perm	NA		Perm	NA			NA	
Protected Phases	5	2			6			4			8	
Permitted Phases				6			4			8		
Actuated Green, G (s)		21.0			14.0			23.0			23.0	
Effective Green, g (s)		21.0			14.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.28			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1415			960			637			761	
v/s Ratio Prot		c0.01									0.01	
v/s Ratio Perm		0.06			c0.12			c0.02				
v/c Ratio		0.18			0.42			0.04			0.01	
Uniform Delay, d1		9.1			14.7			7.4			7.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.3			1.4			0.1			0.0	
Delay (s)		9.4			16.0			7.6			7.4	
Level of Service		A			B			A			A	
Approach Delay (s)		9.4			16.0			7.6			7.4	
Approach LOS		A			B			A			A	

Intersection Summary					
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.19				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	9.0		
Intersection Capacity Utilization	40.4%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
12: 52nd Street & Dover Street

Children's Hospital
DC_2020 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	12	252	3	11	400	5	3	0	7	2	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	12	252	3	11	400	5	3	0	7	2	0	6
Pedestrians		26			13			16			30	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			1			1			3	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.87			0.93			0.91	0.91	0.93	0.91	0.91	0.87
vC, conflicting volume	435			271			750	750	282	752	750	458
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	278			177			498	498	190	500	497	305
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	99			99			99	100	99	100	100	99
cM capacity (veh/h)	1087			1288			390	396	755	402	409	615

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	267	416	10	8
Volume Left	12	11	3	2
Volume Right	3	5	7	6
cSH	1087	1288	589	543
Volume to Capacity	0.01	0.01	0.02	0.01
Queue Length 95th (ft)	1	1	1	1
Control Delay (s)	0.5	0.3	11.2	11.7
Lane LOS	A	A	B	B
Approach Delay (s)	0.5	0.3	11.2	11.7
Approach LOS			B	B

Intersection Summary					
Average Delay	0.6				
Intersection Capacity Utilization	41.0%	ICU Level of Service		A	
Analysis Period (min)	15				

HCM Unsignalized Intersection Capacity Analysis
13: SR-24 NB Off-Ramp & 52nd Street

Children's Hospital
DC_2020 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	267	0	0	425	1141	0	970	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	267	0	0	425	1141	0	970	0	0
Pedestrians							32			
Lane Width (ft)							12.0			
Walking Speed (ft/s)							4.0			
Percent Blockage							3			
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.81						0.81		0.81	0.81
vC, conflicting volume	1566			299			1865	166	1528	724
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1222			299			1593	166	1176	179
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	457			1225			83	824	0	561

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	134	134	283	522	761	485	485
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	380	761	485	485
cSH	1700	1700	1700	1700	1700	824	824
Volume to Capacity	0.08	0.08	0.17	0.31	0.45	0.59	0.59
Queue Length 95th (ft)	0	0	0	0	0	98	98
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	15.4	15.4
Lane LOS						C	C
Approach Delay (s)	0.0		0.0			15.4	
Approach LOS						C	

Intersection Summary					
Average Delay	5.3				
Intersection Capacity Utilization	51.9%	ICU Level of Service		A	
Analysis Period (min)	15				

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	50	290	737	160	40	955	110	170	130	40	115	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.99		1.00	1.00		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.97		1.00	0.98		1.00	0.96			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.98
Satd. Flow (prot)		1787	4930		1805	5085		1752	1766			1732
Flt Permitted		0.95	1.00		0.95	1.00		0.39	1.00			0.79
Satd. Flow (perm)		1787	4930		1805	5085		713	1766			1392
Peak-hour factor, PHF	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. Flow (vph)	50	290	737	160	40	955	110	170	130	40	115	160
RTOR Reduction (vph)	0	0	32	0	0	15	0	0	13	0	0	0
Lane Group Flow (vph)	0	340	865	0	40	1050	0	170	157	0	0	275
Confl. Peds. (#/hr)				16			7			13	13	
Confl. Bikes (#/hr)				16			2			13		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		21.5	35.0		5.1	18.6		35.9	35.9			25.4
Effective Green, g (s)		21.5	35.0		5.1	18.6		35.9	35.9			25.4
Actuated g/C Ratio		0.24	0.39		0.06	0.21		0.40	0.40			0.28
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		426	1917		102	1050		359	704			392
v/s Ratio Prot		c0.19	0.18		0.02	c0.21		c0.03	0.09			
v/s Ratio Perm								0.15				c0.20
v/c Ratio		0.80	0.45		0.39	1.00		0.47	0.22			0.70
Uniform Delay, d1		32.2	20.4		41.0	35.7		18.7	17.9			28.9
Progression Factor		1.00	1.00		1.14	0.85		1.00	1.00			1.00
Incremental Delay, d2		14.4	0.8		1.9	24.3		1.0	0.7			10.0
Delay (s)		46.6	21.1		48.6	54.5		19.7	18.6			38.9
Level of Service		D	C		D	D		B	B			D
Approach Delay (s)			28.2			54.3			19.1			31.9
Approach LOS			C			D			B			C

Intersection Summary			
HCM 2000 Control Delay	36.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	104.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: 52nd Street & Shattuck Ave

Children's Hospital
DC_2020 AM Plus Phase 1

Movement	SBR
Lane Configurations	
Volume (vph)	391
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.93
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1398
Flt Permitted	1.00
Satd. Flow (perm)	1398
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	391
RTOR Reduction (vph)	281
Lane Group Flow (vph)	110
Confl. Peds. (#/hr)	21
Confl. Bikes (#/hr)	54
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	25.4
Effective Green, g (s)	25.4
Actuated g/C Ratio	0.28
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	394
v/s Ratio Prot	
v/s Ratio Perm	0.08
v/c Ratio	0.28
Uniform Delay, d1	25.2
Progression Factor	1.00
Incremental Delay, d2	1.8
Delay (s)	26.9
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
15: Telegraph Ave & 52nd Street/Claremont Ave

Children's Hospital
DC_2020 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	10	110	60	180	10	772	130	90	700	344
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.98			0.99		1.00	0.96	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.95		1.00	0.89			0.98		1.00	0.95	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1641		1698	1565			3848		1770	3241	
Flt Permitted		0.98		0.95	1.00			0.94		0.95	1.00	
Satd. Flow (perm)		1641		1698	1565			3625		1770	3241	
Peak-hour factor, PHF	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. Flow (vph)	10	10	10	110	60	180	10	772	130	90	700	344
RTOR Reduction (vph)	0	10	0	0	119	0	0	11	0	0	47	0
Lane Group Flow (vph)	0	21	0	99	132	0	0	901	0	90	997	0
Confl. Peds. (#/hr)	6					6	29		24			29
Confl. Bikes (#/hr)			2			3			43			36
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		4.5		15.7	15.7			43.9		7.9	56.3	
Effective Green, g (s)		4.5		15.7	15.7			43.9		7.9	56.3	
Actuated g/C Ratio		0.05		0.17	0.17			0.49		0.09	0.63	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		82		296	273			1768		155	2027	
v/s Ratio Prot		c0.01		0.06	c0.08					0.05	c0.31	
v/s Ratio Perm								0.25				
v/c Ratio		0.25		0.33	0.48			0.51		0.58	0.49	
Uniform Delay, d1		41.1		32.6	33.5			15.7		39.5	9.1	
Progression Factor		1.57		1.00	1.00			0.95		1.00	1.00	
Incremental Delay, d2		1.0		0.7	1.4			0.9		5.4	0.9	
Delay (s)		65.5		33.2	34.8			15.8		44.9	10.0	
Level of Service		E		C	C			B		D	A	
Approach Delay (s)		65.5			34.4			15.8			12.7	
Approach LOS		E			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	82.7%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
16: Telegraph Ave & 51St Street

Children's Hospital
DC_2020 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	262	530	80	120	560	270	111	380	70	180	590	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.98		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3404		1787	3322		1719	3313		1752	3433	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3404		1787	3322		1719	3313		1752	3433	
Peak-hour factor, PHF	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. Flow (vph)	262	530	80	120	560	270	111	380	70	180	590	50
RTOR Reduction (vph)	0	13	0	0	64	0	0	16	0	0	6	0
Lane Group Flow (vph)	262	597	0	120	766	0	111	434	0	180	634	0
Confl. Peds. (#/hr)			41			41			39			49
Confl. Bikes (#/hr)			12			10			36			36
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.9	27.0		10.4	26.0		8.9	24.5		11.6	28.2	
Effective Green, g (s)	11.9	27.0		10.4	26.0		8.9	24.5		11.6	28.2	
Actuated g/C Ratio	0.13	0.30		0.12	0.29		0.10	0.27		0.13	0.31	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	449	1021		206	959		169	901		225	1075	
v/s Ratio Prot	c0.08	0.18		0.07	c0.23		0.06	0.13		c0.10	c0.18	
v/s Ratio Perm												
v/c Ratio	0.58	0.58		0.58	0.80		0.66	0.48		0.80	0.59	
Uniform Delay, d1	36.7	26.7		37.7	29.6		39.1	27.4		38.1	26.0	
Progression Factor	1.23	0.92		1.00	1.00		1.00	1.00		1.29	0.74	
Incremental Delay, d2	1.7	2.2		4.2	6.9		8.9	1.8		16.7	2.2	
Delay (s)	46.9	26.8		41.9	36.5		47.9	29.3		65.8	21.3	
Level of Service	D	C		D	D		D	C		E	C	
Approach Delay (s)		32.9			37.2			33.0			31.1	
Approach LOS		C			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	33.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	74.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	191	0	0	0	0	1555	0	0	0	0	1521	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	191	0	0	0	0	1555	0	0	0	0	1521	251
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	191	0	0	0	0	1555	0	0	0	0	1521	251
Confl. Peds. (#/hr)				8								
Confl. Bikes (#/hr)									3			
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	8.0					45.0					29.0	45.0
Effective Green, g (s)	8.0					45.0					29.0	45.0
Actuated g/C Ratio	0.18					1.00					0.64	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	581					1627					2303	2814
v/s Ratio Prot	0.06										0.43	0.09
v/s Ratio Perm						c0.96						
v/c Ratio	0.33					0.96					0.66	0.09
Uniform Delay, d1	16.2					0.0					5.0	0.0
Progression Factor	1.00					1.00					1.80	1.00
Incremental Delay, d2	1.5					14.0					1.2	0.1
Delay (s)	17.7					14.0					10.2	0.1
Level of Service	B					B					B	A
Approach Delay (s)		17.7			14.0			0.0			8.7	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	1.16			
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	54.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	170	20	70	100	0	30	0	80	10	50	10
Peak Hour 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
Hourly flow rate (vph)	0	170	20	70	100	0	30	0	80	10	50	10

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	190	170	30	80	70
Volume Left (vph)	0	70	30	0	10
Volume Right (vph)	20	0	0	80	10
Hadj (s)	-0.05	0.12	0.50	-0.70	-0.02
Departure Headway (s)	4.5	4.7	5.9	4.7	5.0
Degree Utilization, x	0.24	0.22	0.05	0.11	0.10
Capacity (veh/h)	763	727	567	703	661
Control Delay (s)	8.9	9.0	8.1	7.1	8.5
Approach Delay (s)	8.9	9.0	7.4		8.5
Approach LOS	A	A	A		A

Intersection Summary				
Delay	8.6			
Level of Service	A			
Intersection Capacity Utilization	41.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	160	10	10	100	30	10	10	10	20	10	10
Peak Hour 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
Hourly flow rate (vph)	10	160	10	10	100	30	10	10	10	20	10	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	180	140	30	40
Volume Left (vph)	10	10	10	20
Volume Right (vph)	10	30	10	10
Hadj (s)	-0.01	-0.11	-0.13	-0.05
Departure Headway (s)	4.2	4.1	4.5	4.6
Degree Utilization, x	0.21	0.16	0.04	0.05
Capacity (veh/h)	836	848	737	722
Control Delay (s)	8.3	7.9	7.7	7.8
Approach Delay (s)	8.3	7.9	7.7	7.8
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.1	
Level of Service			A	
Intersection Capacity Utilization			24.1%	ICU Level of Service
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (veh/h)	10	370	10	10	360	20	10	20	20	40	20	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	370	10	10	360	20	10	20	20	40	20	10
Pedestrians		11			3			13			15	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	395			393			829	823	391	833	818	396
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	395			393			829	823	391	833	818	396
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			96	93	97	84	93	98
cM capacity (veh/h)	1154			1164			259	298	653	253	298	639

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	390	390	50	70
Volume Left	10	10	10	40
Volume Right	10	20	20	10
cSH	1154	1164	367	291
Volume to Capacity	0.01	0.01	0.14	0.24
Queue Length 95th (ft)	1	1	12	23
Control Delay (s)	0.3	0.3	16.3	21.3
Lane LOS	A	A	C	C
Approach Delay (s)	0.3	0.3	16.3	21.3
Approach LOS			C	C

Intersection Summary				
Average Delay			2.8	
Intersection Capacity Utilization			42.1%	ICU Level of Service
Analysis Period (min)			15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	34	1707	201	0	1784
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	34	1707	201	0	1784
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			154			137
pX, platoon unblocked	0.85	0.76			0.76	
vC, conflicting volume	2402	670			1908	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	574	0			1085	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	382	823			485	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	34	683	683	542	595	595	595
Volume Left	0	0	0	0	0	0	0
Volume Right	34	0	0	201	0	0	0
cSH	823	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.04	0.40	0.40	0.32	0.35	0.35	0.35
Queue Length 95th (ft)	3	0	0	0	0	0	0
Control Delay (s)	9.6	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	9.6	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	47.5%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	1	1721	25	0	1822
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	1	1721	25	0	1822
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			424			204
pX, platoon unblocked	0.78					
vC, conflicting volume	2341	586			1746	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1735	586			1746	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	61	453			356	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	1	688	688	369	607	607	607
Volume Left	0	0	0	0	0	0	0
Volume Right	1	0	0	25	0	0	0
cSH	453	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.40	0.40	0.22	0.36	0.36	0.36
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	13.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	13.0	0.0			0.0		
Approach LOS	B						

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	43.8%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	20	260	170	60	170	70	29	211	1652	156	130	1351
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			0.99			1.00	0.99		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.95			0.97			1.00	0.99		1.00	1.00
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1751			1735			1770	4979		1770	5060
Flt Permitted		0.98			0.67			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1718			1181			1770	4979		1770	5060
Peak-hour factor, PHF	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. Flow (vph)	20	260	170	60	170	70	29	211	1652	156	130	1351
RTOR Reduction (vph)	0	24	0	0	12	0	0	0	10	0	0	2
Lane Group Flow (vph)	0	426	0	0	288	0	0	240	1798	0	130	1379
Confl. Peds. (#/hr)	15		20	20		15				26		
Confl. Bikes (#/hr)			21			16				20		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		29.3			29.3			21.5	45.5		10.7	34.7
Effective Green, g (s)		29.3			29.3			21.5	45.5		10.7	34.7
Actuated g/C Ratio		0.29			0.29			0.22	0.46		0.11	0.35
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		503			346			380	2265		189	1755
v/s Ratio Prot								0.14	c0.36		0.07	c0.27
v/s Ratio Perm		c0.25			0.24							
v/c Ratio		0.85			0.83			0.63	0.79		0.69	0.79
Uniform Delay, d1		33.2			33.1			35.7	23.2		43.0	29.3
Progression Factor		1.00			1.00			0.55	0.39		1.00	1.00
Incremental Delay, d2		12.5			15.6			2.8	2.5		10.0	3.6
Delay (s)		45.7			48.6			22.5	11.5		53.0	32.9
Level of Service		D			D			C	B		D	C
Approach Delay (s)		45.7			48.6				12.8			34.7
Approach LOS		D			D				B			C

Intersection Summary			
HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	93.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	30
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	30
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	16
Confl. Bikes (#/hr)	20
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	496	20	10	230	20	20	20	30	20	20	40
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	496	20	10	230	20	20	20	30	20	20	40
Pedestrians		6			17			10			23	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked				0.96			0.96	0.96	0.96	0.96	0.96	
vC, conflicting volume	273			526			892	869	533	906	869	269
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	273			482			864	840	489	879	840	269
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			91	93	94	90	93	95
cM capacity (veh/h)	1249			1015			222	273	545	210	270	749

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	546	260	70	80
Volume Left	30	10	20	20
Volume Right	20	20	30	40
cSH	1249	1015	321	359
Volume to Capacity	0.02	0.01	0.22	0.22
Queue Length 95th (ft)	2	1	20	21
Control Delay (s)	0.7	0.4	19.3	17.9
Lane LOS	A	A	C	C
Approach Delay (s)	0.7	0.4	19.3	17.9
Approach LOS			C	C

Intersection Summary				
Average Delay	3.4			
Intersection Capacity Utilization	55.2%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
DC_2020 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	386	60	30	160	50	50	560	40	30	550	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.99			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.97			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		1752			1760			1833			1853	
Flt Permitted		0.91			0.91			0.92			0.96	
Satd. Flow (perm)		1602			1619			1696			1774	
Peak-hour factor, PHF	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. Flow (vph)	90	386	60	30	160	50	50	560	40	30	550	40
RTOR Reduction (vph)	0	6	0	0	12	0	0	3	0	0	3	0
Lane Group Flow (vph)	0	530	0	0	228	0	0	647	0	0	617	0
Confl. Peds. (#/hr)	15		15	15		15	25		10	10		25
Confl. Bikes (#/hr)			20			13			41			29
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		29.0			29.0			43.0			43.0	
Effective Green, g (s)		29.0			29.0			43.0			43.0	
Actuated g/C Ratio		0.36			0.36			0.54			0.54	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		580			586			911			953	
v/s Ratio Prot												
v/s Ratio Perm		c0.33			0.14			c0.38			0.35	
v/c Ratio		0.91			0.39			0.71			0.65	
Uniform Delay, d1		24.3			18.9			13.8			13.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		21.3			1.9			4.7			3.4	
Delay (s)		45.6			20.9			18.5			16.5	
Level of Service		D			C			B			B	
Approach Delay (s)		45.6			20.9			18.5			16.5	
Approach LOS		D			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	25.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	100.1%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
DC_2020 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	295	30	121	50	20	20	90	987	70	20	991	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.98			0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes		0.99			0.99		0.99	1.00		0.99	1.00	
Frt		0.96			0.97		1.00	0.99		1.00	0.99	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1645			1696		1751	3481		1773	3472	
Flt Permitted		0.77			0.74		0.18	1.00		0.19	1.00	
Satd. Flow (perm)		1300			1285		326	3481		357	3472	
Peak-hour factor, PHF	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. Flow (vph)	295	30	121	50	20	20	90	987	70	20	991	110
RTOR Reduction (vph)	0	16	0	0	12	0	0	6	0	0	9	0
Lane Group Flow (vph)	0	430	0	0	78	0	90	1051	0	20	1092	0
Confl. Peds. (#/hr)	15		34	34		15	33		23	23		33
Confl. Bikes (#/hr)			11			12			38			59
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		32.7			32.7		48.3	48.3		48.3	48.3	
Effective Green, g (s)		32.7			32.7		48.3	48.3		48.3	48.3	
Actuated g/C Ratio		0.36			0.36		0.54	0.54		0.54	0.54	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		472			466		174	1868		191	1863	
v/s Ratio Prot								0.30			c0.31	
v/s Ratio Perm		c0.33			0.06		0.28			0.06		
v/c Ratio		0.91			0.17		0.52	0.56		0.10	0.59	
Uniform Delay, d1		27.3			19.4		13.4	13.8		10.2	14.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		21.7			0.2		10.6	1.2		1.1	1.4	
Delay (s)		49.0			19.6		23.9	15.1		11.3	15.5	
Level of Service		D			B		C	B		B	B	
Approach Delay (s)		49.0			19.6			15.8			15.4	
Approach LOS		D			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	80.2%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (veh/h)	10	10	50	20	10	10	13	40	1990	48	10	20
Sign Control		Stop			Stop				Free			
Grade		0%			0%				0%			
Peak Hour 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
Hourly flow rate (vph)	10	10	50	20	10	10	0	40	1990	48	0	20
Pedestrians		7			25				15			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		1			2				1			
Right turn flare (veh)												
Median type									None			
Median storage veh)												
Upstream signal (ft)									299			
pX, platoon unblocked	0.88	0.88	0.76	0.88	0.88	0.76	0.00	0.76			0.00	0.76
vC, conflicting volume	2365	3750	549	2746	3736	712	0	1577			0	2063
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	204	1785	0	638	1769	0	0	647			0	1274
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			0.0	4.1
tC, 2 stage (s)												
tF (s)	*5.0	*5.0	*5.0	*5.0	*5.0	*5.0	0.0	2.2			0.0	2.2
p0 queue free %	97	83	91	88	84	98	0	94			0	95
cM capacity (veh/h)	365	59	536	174	61	533	0	705			0	404

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	70	40	538	995	546	408	775	408
Volume Left	10	20	40	0	0	20	0	0
Volume Right	50	10	0	0	48	0	0	20
cSH	242	134	705	1700	1700	404	1700	1700
Volume to Capacity	0.29	0.30	0.06	0.59	0.32	0.05	0.46	0.24
Queue Length 95th (ft)	29	29	5	0	0	4	0	0
Control Delay (s)	25.8	42.9	1.5	0.0	0.0	1.6	0.0	0.0
Lane LOS	D	E	A			A		
Approach Delay (s)	25.8	42.9	0.4			0.4		
Approach LOS	D	E						

Intersection Summary				
Average Delay	1.3			
Intersection Capacity Utilization	90.1%	ICU Level of Service	E	
Analysis Period (min)	15			

* User Entered Value

Movement	SBT	SBR
Lane Configurations		
Volume (veh/h)	1550	20
Sign Control	Free	
Grade	0%	
Peak Hour Factor	1.00	1.00
Hourly flow rate (vph)	1550	20
Pedestrians		
Lane Width (ft)		
Walking Speed (ft/s)		
Percent Blockage		
Right turn flare (veh)		
Median type	None	
Median storage veh)		
Upstream signal (ft)	294	
pX, platoon unblocked		
vC, conflicting volume		
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol		
tC, single (s)		
tC, 2 stage (s)		
tF (s)		
p0 queue free %		
cM capacity (veh/h)		

Direction, Lane #

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	48	10	10	10	20	10	40	10	10	30	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	48	10	10	10	20	10	40	10	10	30	10
Pedestrians		16			11			8			4	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	165	152	59	173	152	60	56			61		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	165	152	59	173	152	60	56			61		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	93	99	99	99	98	99			99		
cM capacity (veh/h)	746	717	992	715	717	999	1541			1541		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	68	40	60	50
Volume Left	10	10	10	10
Volume Right	10	20	10	10
cSH	752	834	1541	1541
Volume to Capacity	0.09	0.05	0.01	0.01
Queue Length 95th (ft)	7	4	0	0
Control Delay (s)	10.3	9.5	1.3	1.5
Lane LOS	B	A	A	A
Approach Delay (s)	10.3	9.5	1.3	1.5
Approach LOS	B	A		

Intersection Summary				
Average Delay	5.6			
Intersection Capacity Utilization	21.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	48	20	660	650	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	48	20	660	650	10
Pedestrians	33				2	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	3				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.82	0.77	0.77			
vC, conflicting volume	1390	688	693			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1087	444	450			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	90	98			
cM capacity (veh/h)	187	462	830			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	58	680	660
Volume Left	10	20	0
Volume Right	48	0	10
cSH	369	830	1700
Volume to Capacity	0.16	0.02	0.39
Queue Length 95th (ft)	14	2	0
Control Delay (s)	16.6	0.6	0.0
Lane LOS	C	A	
Approach Delay (s)	16.6	0.6	0.0
Approach LOS	C		

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	61.0%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	10	4	69	70	10	8	10	10	2073	105	4	1644
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			1.00			1.00	0.99		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.89			0.99			1.00	0.99		1.00	1.00
Flt Protected		0.99			0.96			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1610			1795			1770	5012		1787	5128
Flt Permitted		0.96			0.73			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1562			1361			1770	5012		1787	5128
Peak-hour factor, PHF	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. Flow (vph)	10	4	69	70	10	8	10	10	2073	105	4	1644
RTOR Reduction (vph)	0	57	0	0	4	0	0	0	3	0	0	0
Lane Group Flow (vph)	0	26	0	0	84	0	0	20	2175	0	4	1654
Confl. Peds. (#/hr)	11		6	6		11				42		
Confl. Bikes (#/hr)			6			3				17		
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		17.3			17.3			3.1	68.4		1.8	67.1
Effective Green, g (s)		17.3			17.3			3.1	68.4		1.8	67.1
Actuated g/C Ratio		0.17			0.17			0.03	0.68		0.02	0.67
Clearance Time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		270			235			54	3428		32	3440
v/s Ratio Prot								0.01	c0.43		0.00	c0.32
v/s Ratio Perm		0.02			c0.06							
v/c Ratio		0.10			0.36			0.37	0.63		0.12	0.48
Uniform Delay, d1		34.8			36.4			47.5	8.8		48.3	8.0
Progression Factor		1.00			1.02			1.44	0.24		0.78	0.48
Incremental Delay, d2		0.2			0.9			3.0	0.6		1.2	0.3
Delay (s)		34.9			38.0			71.2	2.7		38.7	4.2
Level of Service		C			D			E	A		D	A
Approach Delay (s)		34.9			38.0				3.4			4.3
Approach LOS		C			D				A			A

Intersection Summary			
HCM 2000 Control Delay	5.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: MLK Way & 53rd Street

Children's Hospital
DC_2020 PM Plus Phase 1

Movement	SBR
Lane Configurations	
Volume (vph)	10
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	10
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	19
Confl. Bikes (#/hr)	21
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis
9: Dover Street & 53rd Street

Children's Hospital
DC_2020 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	60	20	0	0	20	10	0	0	0	10	0	40
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	60	20	0	0	20	10	0	0	0	10	0	40
Pedestrians		33			13			6			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	99	86	59	69	106	19	73			13		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	99	86	59	69	106	19	73			13		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	97	100	100	97	99	100			99		
cM capacity (veh/h)	805	772	980	865	753	1048	1497			1601		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	80	30	0	50
Volume Left	60	0	0	10
Volume Right	0	10	0	40
cSH	797	831	1700	1601
Volume to Capacity	0.10	0.04	0.00	0.01
Queue Length 95th (ft)	8	3	0	0
Control Delay (s)	10.0	9.5	0.0	1.5
Lane LOS	B	A		A
Approach Delay (s)	10.0	9.5	0.0	1.5
Approach LOS	B	A		

Intersection Summary				
Average Delay	7.3			
Intersection Capacity Utilization	28.8%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
10: MLK Way & 52nd Street

Children's Hospital
DC_2020 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	88	112	100	112	95	261	50	90	1757	75	4	207
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.95			1.00	0.96		1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00			0.97	1.00		1.00	1.00			1.00
Frt	1.00	0.93			1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00			0.97	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1762	1668			1762	1525		1787	5095			1787
Flt Permitted	0.51	1.00			0.57	1.00		0.95	1.00			0.95
Satd. Flow (perm)	942	1668			1039	1525		1787	5095			1787
Peak-hour factor, PHF	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. Flow (vph)	88	112	100	112	95	261	50	90	1757	75	4	207
RTOR Reduction (vph)	0	35	0	0	0	196	0	0	4	0	0	0
Lane Group Flow (vph)	88	177	0	0	207	65	0	140	1828	0	0	211
Confl. Peds. (#/hr)	21		80	80		21				13		
Confl. Bikes (#/hr)			12			6				20		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	24.9	24.9			24.9	24.9		12.0	44.1			17.5
Effective Green, g (s)	24.9	24.9			24.9	24.9		12.0	44.1			17.5
Actuated g/C Ratio	0.25	0.25			0.25	0.25		0.12	0.44			0.18
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	234	415			258	379		214	2246			312
v/s Ratio Prot		0.11						0.08	c0.36			0.12
v/s Ratio Perm	0.09				c0.20	0.04						
v/c Ratio	0.38	0.43			0.80	0.17		0.65	0.81			0.68
Uniform Delay, d1	31.1	31.5			35.2	29.5		42.0	24.4			38.6
Progression Factor	1.00	1.00			0.93	2.51		0.98	1.06			0.62
Incremental Delay, d2	0.4	0.3			14.9	0.1		2.1	1.3			4.2
Delay (s)	31.5	31.8			47.8	74.0		43.5	27.2			28.2
Level of Service	C	C			D	E		D	C			C
Approach Delay (s)		31.7			62.4				28.3			
Approach LOS		C			E				C			

Intersection Summary			
HCM 2000 Control Delay	24.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	109.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1568	14
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5125	
Flt Permitted	1.00	
Satd. Flow (perm)	5125	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1568	14
RTOR Reduction (vph)	1	0
Lane Group Flow (vph)	1581	0
Confl. Peds. (#/hr)		17
Confl. Bikes (#/hr)		23
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	49.1	
Effective Green, g (s)	49.1	
Actuated g/C Ratio	0.49	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2516	
v/s Ratio Prot	c0.31	
v/s Ratio Perm		
v/c Ratio	0.63	
Uniform Delay, d1	18.7	
Progression Factor	0.31	
Incremental Delay, d2	1.1	
Delay (s)	6.9	
Level of Service	A	
Approach Delay (s)	9.4	
Approach LOS	A	

Intersection Summary				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	375	8	8	372	2	25	3	13	0	4	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.94			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.96			0.87	
Flt Protected		1.00			1.00			0.97			1.00	
Satd. Flow (prot)		3515			3596			1432			1640	
Flt Permitted		0.95			0.95			0.89			1.00	
Satd. Flow (perm)		3357			3409			1315			1640	
Peak-hour factor, PHF	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. Flow (vph)	3	375	8	8	372	2	25	3	13	0	4	59
RTOR Reduction (vph)	0	3	0	0	1	0	0	7	0	0	32	0
Lane Group Flow (vph)	0	383	0	0	381	0	0	34	0	0	31	0
Confl. Peds. (#/hr)			77	77		33			271	271		
Confl. Bikes (#/hr)			13			8						2
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Prot	NA		Perm	NA		Perm	NA			NA	
Protected Phases	5	2			6			4			8	
Permitted Phases				6			4			8		
Actuated Green, G (s)		21.0			14.0			23.0			23.0	
Effective Green, g (s)		21.0			14.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.28			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1422			954			604			754	
v/s Ratio Prot		c0.02									0.02	
v/s Ratio Perm		0.09			c0.11			c0.03				
v/c Ratio		0.27			0.40			0.06			0.04	
Uniform Delay, d1		9.5			14.6			7.5			7.4	
Progression Factor		1.91			1.00			1.00			1.00	
Incremental Delay, d2		0.4			1.3			0.2			0.1	
Delay (s)		18.5			15.8			7.7			7.5	
Level of Service		B			B			A			A	
Approach Delay (s)		18.5			15.8			7.7			7.5	
Approach LOS		B			B			A			A	

Intersection Summary					
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.20				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	9.0		
Intersection Capacity Utilization	41.9%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
12: 52nd Street & Dover Street

Children's Hospital
DC_2020 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	381	8	5	378	4	7	0	8	10	0	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	8	381	8	5	378	4	7	0	8	10	0	14
Pedestrians		49			10			46			20	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		4			1			4			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.89			0.88			0.94	0.94	0.88	0.94	0.94	0.89
vC, conflicting volume	402			435			900	859	441	829	861	449
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	264			293			592	549	300	517	551	317
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	99			100			98	100	99	98	100	98
cM capacity (veh/h)	1131			1081			326	379	607	405	390	610

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	397	387	15	24
Volume Left	8	5	7	10
Volume Right	8	4	8	14
cSH	1131	1081	433	504
Volume to Capacity	0.01	0.00	0.03	0.05
Queue Length 95th (ft)	1	0	3	4
Control Delay (s)	0.2	0.2	13.6	12.5
Lane LOS	A	A	B	B
Approach Delay (s)	0.2	0.2	13.6	12.5
Approach LOS			B	B

Intersection Summary					
Average Delay	0.8				
Intersection Capacity Utilization	43.5%	ICU Level of Service		A	
Analysis Period (min)	15				

HCM Unsignalized Intersection Capacity Analysis
13: SR-24 NB Off-Ramp & 52nd Street

Children's Hospital
DC_2020 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	397	0	0	392	1067	0	1050	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	397	0	0	392	1067	0	1050	0	0
Pedestrians							43			
Lane Width (ft)							12.0			
Walking Speed (ft/s)							4.0			
Percent Blockage							4			
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.82						0.82		0.82	0.82
vC, conflicting volume	1459			440			1899	242	1640	832
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1114			440			1653	242	1336	347
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	509			1076			77	729	0	453

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	198	198	261	486	711	525	525
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	356	711	525	525
cSH	1700	1700	1700	1700	1700	729	729
Volume to Capacity	0.12	0.12	0.15	0.29	0.42	0.72	0.72
Queue Length 95th (ft)	0	0	0	0	0	155	155
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	21.6	21.6
Lane LOS						C	C
Approach Delay (s)	0.0		0.0			21.6	
Approach LOS						C	

Intersection Summary					
Average Delay	7.8				
Intersection Capacity Utilization	56.2%	ICU Level of Service		B	
Analysis Period (min)	15				

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	50	320	887	190	60	882	150	160	240	60	171	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.98		1.00	0.99		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			0.99
Frt		1.00	0.97		1.00	0.98		1.00	0.97			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.97
Satd. Flow (prot)		1787	4919		1805	5012		1752	1764			1708
Flt Permitted		0.95	1.00		0.95	1.00		0.25	1.00			0.68
Satd. Flow (perm)		1787	4919		1805	5012		467	1764			1193
Peak-hour factor, PHF	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. Flow (vph)	50	320	887	190	60	882	150	160	240	60	171	150
RTOR Reduction (vph)	0	0	29	0	0	21	0	0	8	0	0	0
Lane Group Flow (vph)	0	370	1048	0	60	1011	0	160	292	0	0	321
Confl. Peds. (#/hr)				19	19		15			29	29	
Confl. Bikes (#/hr)				17			11			39		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		33.5	55.1		5.2	26.8		35.7	35.7			26.2
Effective Green, g (s)		33.5	55.1		5.2	26.8		35.7	35.7			26.2
Actuated g/C Ratio		0.30	0.50		0.05	0.24		0.32	0.32			0.24
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		544	2463		85	1221		215	572			284
v/s Ratio Prot		c0.21	0.21		0.03	c0.20		c0.04	0.17			
v/s Ratio Perm								0.20				c0.27
v/c Ratio		0.68	0.43		0.71	0.83		0.74	0.51			1.13
Uniform Delay, d1		33.6	17.4		51.6	39.4		32.8	30.1			41.9
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Incremental Delay, d2		6.7	0.5		23.3	6.5		13.0	3.2			93.2
Delay (s)		40.3	17.9		75.0	46.0		45.8	33.3			135.1
Level of Service		D	B		E	D		D	C			F
Approach Delay (s)			23.7			47.5			37.6			82.2
Approach LOS			C			D			D			F

Intersection Summary			
HCM 2000 Control Delay	43.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	104.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: 52nd Street & Shattuck Ave

Children's Hospital
DC_2020 PM Plus Phase 1

Movement	SBR
Lane Configurations	
Volume (vph)	367
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.93
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1400
Flt Permitted	1.00
Satd. Flow (perm)	1400
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	367
RTOR Reduction (vph)	280
Lane Group Flow (vph)	87
Confl. Peds. (#/hr)	24
Confl. Bikes (#/hr)	36
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	26.2
Effective Green, g (s)	26.2
Actuated g/C Ratio	0.24
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	333
v/s Ratio Prot	
v/s Ratio Perm	0.06
v/c Ratio	0.26
Uniform Delay, d1	34.0
Progression Factor	1.00
Incremental Delay, d2	1.9
Delay (s)	36.0
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
15: Telegraph Ave & 52nd Street/Claremont Ave

Children's Hospital
DC_2020 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	20	20	140	80	180	20	957	270	140	721	301
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.94			0.98		1.00	0.91	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.95		1.00	0.90			0.97		1.00	0.96	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1642		1698	1513			3770		1770	3088	
Flt Permitted		0.98		0.95	1.00			0.93		0.95	1.00	
Satd. Flow (perm)		1642		1698	1513			3496		1770	3088	
Peak-hour factor, PHF	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. Flow (vph)	20	20	20	140	80	180	20	957	270	140	721	301
RTOR Reduction (vph)	0	19	0	0	73	0	0	22	0	0	39	0
Lane Group Flow (vph)	0	41	0	126	201	0	0	1225	0	140	983	0
Confl. Peds. (#/hr)	45					45	91		29			91
Confl. Bikes (#/hr)			2			13			46			63
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		6.2		18.0	18.0			45.9		11.9	62.3	
Effective Green, g (s)		6.2		18.0	18.0			45.9		11.9	62.3	
Actuated g/C Ratio		0.06		0.18	0.18			0.46		0.12	0.62	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		101		305	272			1604		210	1923	
v/s Ratio Prot		c0.03		0.07	c0.13					c0.08	0.32	
v/s Ratio Perm								c0.35				
v/c Ratio		0.41		0.41	0.74			0.76		0.67	0.51	
Uniform Delay, d1		45.1		36.3	38.8			22.5		42.2	10.4	
Progression Factor		1.81		1.00	1.00			0.57		1.00	1.00	
Incremental Delay, d2		1.2		0.9	10.0			2.4		7.8	1.0	
Delay (s)		82.8		37.2	48.8			15.3		49.9	11.4	
Level of Service		F		D	D			B		D	B	
Approach Delay (s)		82.8			45.2			15.3			16.0	
Approach LOS		F			D			B			B	

Intersection Summary				
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	99.6%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
16: Telegraph Ave & 51St Street

Children's Hospital
DC_2020 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	317	660	101	70	520	240	101	690	120	280	541	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.97		1.00	0.98		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3383		1787	3299		1719	3293		1752	3363	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3383		1787	3299		1719	3293		1752	3363	
Peak-hour factor, PHF	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. Flow (vph)	317	660	101	70	520	240	101	690	120	280	541	60
RTOR Reduction (vph)	0	12	0	0	54	0	0	14	0	0	9	0
Lane Group Flow (vph)	317	749	0	70	706	0	101	796	0	280	592	0
Confl. Peds. (#/hr)			68			50			75			120
Confl. Bikes (#/hr)			11			20			45			71
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.2	29.1		8.0	23.4		8.5	33.4		13.0	38.9	
Effective Green, g (s)	14.2	29.1		8.0	23.4		8.5	33.4		13.0	38.9	
Actuated g/C Ratio	0.14	0.29		0.08	0.23		0.08	0.33		0.13	0.39	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	482	984		142	771		146	1099		227	1308	
v/s Ratio Prot	c0.09	0.22		0.04	c0.21		0.06	c0.24		c0.16	0.18	
v/s Ratio Perm												
v/c Ratio	0.66	0.76		0.49	0.92		0.69	0.72		1.23	0.45	
Uniform Delay, d1	40.6	32.3		44.1	37.3		44.5	29.3		43.5	22.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.21	0.70	
Incremental Delay, d2	3.2	5.5		2.7	17.4		13.2	4.2		134.2	1.0	
Delay (s)	43.8	37.8		46.7	54.8		57.7	33.4		186.8	16.8	
Level of Service	D	D		D	D		E	C		F	B	
Approach Delay (s)		39.6			54.1			36.1			70.8	
Approach LOS		D			D			D			E	

Intersection Summary				
HCM 2000 Control Delay	49.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	85.3%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	300	0	0	0	0	1672	0	0	0	0	1620	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	300	0	0	0	0	1672	0	0	0	0	1620	240
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	300	0	0	0	0	1672	0	0	0	0	1620	240
Confl. Peds. (#/hr)				3								
Confl. Bikes (#/hr)									12			
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	13.0					50.0					29.0	50.0
Effective Green, g (s)	13.0					50.0					29.0	50.0
Actuated g/C Ratio	0.26					1.00					0.58	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	850					1627					2072	2814
v/s Ratio Prot	0.09										0.45	0.09
v/s Ratio Perm						c1.03						
v/c Ratio	0.35					1.03					0.78	0.09
Uniform Delay, d1	15.1					25.0					8.1	0.0
Progression Factor	1.00					1.00					2.61	1.00
Incremental Delay, d2	1.2					29.7					2.4	0.0
Delay (s)	16.2					54.7					23.5	0.0
Level of Service	B					D					C	A
Approach Delay (s)		16.2			54.7			0.0			20.4	
Approach LOS		B			D			A			C	

Intersection Summary				
HCM 2000 Control Delay	35.1	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.22			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	60.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	140	10	90	109	0	50	0	140	10	60	10
Peak Hour 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
Hourly flow rate (vph)	0	140	10	90	109	0	50	0	140	10	60	10

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	150	199	50	140	80
Volume Left (vph)	0	90	50	0	10
Volume Right (vph)	10	0	0	140	10
Hadj (s)	-0.02	0.12	0.50	-0.70	-0.02
Departure Headway (s)	4.8	4.9	6.0	4.8	5.1
Degree Utilization, x	0.20	0.27	0.08	0.19	0.11
Capacity (veh/h)	696	693	568	704	641
Control Delay (s)	9.0	9.7	8.3	7.6	8.8
Approach Delay (s)	9.0	9.7	7.8		8.8
Approach LOS	A	A	A		A

Intersection Summary				
Delay	8.8			
Level of Service	A			
Intersection Capacity Utilization	42.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	130	10	10	109	50	10	10	10	20	10	10
Peak Hour 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
Hourly flow rate (vph)	10	130	10	10	109	50	10	10	10	20	10	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	150	169	30	40
Volume Left (vph)	10	10	10	20
Volume Right (vph)	10	50	10	10
Hadj (s)	-0.01	-0.17	-0.13	-0.05
Departure Headway (s)	4.2	4.1	4.5	4.6
Degree Utilization, x	0.18	0.19	0.04	0.05
Capacity (veh/h)	830	867	738	724
Control Delay (s)	8.1	8.0	7.7	7.8
Approach Delay (s)	8.1	8.0	7.7	7.8
Approach LOS	A	A	A	A

Intersection Summary				
Delay		8.0		
Level of Service		A		
Intersection Capacity Utilization	23.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	380	10	20	381	40	10	20	40	40	10	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	20	380	10	20	381	40	10	20	40	40	10	20
Pedestrians		7						10			4	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		1						1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	425			400			908	900	395	920	885	412
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	425			400			908	900	395	920	885	412
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			96	93	94	81	96	97
cM capacity (veh/h)	1136			1160			231	268	653	214	271	634

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	410	441	70	70
Volume Left	20	20	10	40
Volume Right	10	40	40	20
cSH	1136	1160	391	274
Volume to Capacity	0.02	0.02	0.18	0.26
Queue Length 95th (ft)	1	1	16	25
Control Delay (s)	0.6	0.5	16.2	22.6
Lane LOS	A	A	C	C
Approach Delay (s)	0.6	0.5	16.2	22.6
Approach LOS			C	C

Intersection Summary				
Average Delay		3.2		
Intersection Capacity Utilization		47.4%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	123	2076	34	0	1793
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	123	2076	34	0	1793
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			154			137
pX, platoon unblocked	0.77	0.69			0.69	
vC, conflicting volume	2691	709			2110	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	749	0			1019	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	83			100	
cM capacity (veh/h)	266	745			465	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	123	830	830	449	598	598	598
Volume Left	0	0	0	0	0	0	0
Volume Right	123	0	0	34	0	0	0
cSH	745	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.17	0.49	0.49	0.26	0.35	0.35	0.35
Queue Length 95th (ft)	15	0	0	0	0	0	0
Control Delay (s)	10.8	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	10.8	0.0			0.0		
Approach LOS	B						

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	55.1%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	1952	20	0	1830
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	1952	20	0	1830
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			424			204
pX, platoon unblocked	0.77					
vC, conflicting volume	2572	661			1972	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2005	661			1972	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	40	405			290	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	0	781	781	410	610	610	610
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	20	0	0	0
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.46	0.46	0.24	0.36	0.36	0.36
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	0.0	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	41.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	20	180	230	60	240	80	21	150	1386	72	90	1341
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			0.99			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.93			0.97			1.00	0.99		1.00	0.99
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1703			1747			1770	5027		1770	5047
Flt Permitted		0.98			0.77			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1664			1360			1770	5027		1770	5047
Peak-hour factor, PHF	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. Flow (vph)	20	180	230	60	240	80	21	150	1386	72	90	1341
RTOR Reduction (vph)	0	52	0	0	12	0	0	0	5	0	0	4
Lane Group Flow (vph)	0	378	0	0	368	0	0	171	1453	0	90	1387
Confl. Peds. (#/hr)	10		19	19		10				28		
Confl. Bikes (#/hr)			21			20				8		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		27.7			27.7			14.4	41.8		6.0	33.4
Effective Green, g (s)		27.7			27.7			14.4	41.8		6.0	33.4
Actuated g/C Ratio		0.31			0.31			0.16	0.46		0.07	0.37
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		512			418			283	2334		118	1872
v/s Ratio Prot								0.10	c0.29		0.05	c0.27
v/s Ratio Perm		0.23			c0.27							
v/c Ratio		0.74			0.88			0.60	0.62		0.76	0.74
Uniform Delay, d1		27.9			29.6			35.2	18.2		41.3	24.5
Progression Factor		1.00			1.00			0.55	0.25		1.00	1.00
Incremental Delay, d2		5.5			19.0			3.3	1.1		24.8	2.7
Delay (s)		33.4			48.6			22.5	5.7		66.1	27.2
Level of Service		C			D			C	A		E	C
Approach Delay (s)		33.4			48.6				7.5			29.6
Approach LOS		C			D				A			C

Intersection Summary			
HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	90.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	50
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	50
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	16
Confl. Bikes (#/hr)	10
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	302	10	30	320	10	10	10	20	10	10	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	302	10	30	320	10	10	10	20	10	10	30
Pedestrians		12			26			20			8	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			2			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked	0.89						0.89	0.89		0.89	0.89	0.89
vC, conflicting volume	338			332			819	785	353	811	785	345
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	196			332			736	698	353	727	698	204
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			97			96	97	97	96	97	96
cM capacity (veh/h)	1203			1196			259	304	669	262	301	731

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	342	360	40	50
Volume Left	30	30	10	10
Volume Right	10	10	20	30
cSH	1203	1196	394	445
Volume to Capacity	0.02	0.03	0.10	0.11
Queue Length 95th (ft)	2	2	8	9
Control Delay (s)	0.9	0.9	15.2	14.1
Lane LOS	A	A	C	B
Approach Delay (s)	0.9	0.9	15.2	14.1
Approach LOS			C	B

Intersection Summary					
Average Delay	2.5				
Intersection Capacity Utilization	41.1%	ICU Level of Service		A	
Analysis Period (min)	15				

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
DC_2020 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	232	60	35	270	50	40	460	33	30	570	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.99			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.99			0.99	
Flt Protected		0.99			1.00			1.00			1.00	
Satd. Flow (prot)		1727			1786			1834			1855	
Flt Permitted		0.86			0.95			0.93			0.96	
Satd. Flow (perm)		1490			1698			1709			1792	
Peak-hour factor, PHF	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. Flow (vph)	60	232	60	35	270	50	40	460	33	30	570	40
RTOR Reduction (vph)	0	9	0	0	8	0	0	3	0	0	3	0
Lane Group Flow (vph)	0	343	0	0	347	0	0	530	0	0	637	0
Confl. Peds. (#/hr)	8		17	17		8	10		23	23		10
Confl. Bikes (#/hr)			29			13			17			32
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		25.0			25.0			47.0			47.0	
Effective Green, g (s)		25.0			25.0			47.0			47.0	
Actuated g/C Ratio		0.31			0.31			0.59			0.59	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		465			530			1004			1052	
v/s Ratio Prot												
v/s Ratio Perm		c0.23			0.20			0.31			c0.36	
v/c Ratio		0.74			0.66			0.53			0.61	
Uniform Delay, d1		24.6			23.8			9.9			10.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		10.0			6.2			2.0			2.6	
Delay (s)		34.6			30.0			11.9			13.2	
Level of Service		C			C			B			B	
Approach Delay (s)		34.6			30.0			11.9			13.2	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	79.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
DC_2020 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	165	20	90	40	10	10	70	850	50	40	1000	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	0.99		1.00	0.98	
Flpb, ped/bikes		1.00			0.99		1.00	1.00		0.99	1.00	
Frt		0.96			0.98		1.00	0.99		1.00	0.97	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1649			1709		1763	3491		1768	3409	
Flt Permitted		0.78			0.76		0.16	1.00		0.28	1.00	
Satd. Flow (perm)		1327			1339		298	3491		516	3409	
Peak-hour factor, PHF	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. Flow (vph)	165	20	90	40	10	10	70	850	50	40	1000	265
RTOR Reduction (vph)	0	29	0	0	7	0	0	5	0	0	27	0
Lane Group Flow (vph)	0	246	0	0	53	0	70	895	0	40	1238	0
Confl. Peds. (#/hr)	8		15	15		8	17		23	23		17
Confl. Bikes (#/hr)			20			20			56			36
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		18.3			18.3		42.7	42.7		42.7	42.7	
Effective Green, g (s)		18.3			18.3		42.7	42.7		42.7	42.7	
Actuated g/C Ratio		0.26			0.26		0.61	0.61		0.61	0.61	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		346			350		181	2129		314	2079	
v/s Ratio Prot								0.26			c0.36	
v/s Ratio Perm		c0.19			0.04		0.24			0.08		
v/c Ratio		0.71			0.15		0.39	0.42		0.13	0.60	
Uniform Delay, d1		23.5			19.9		7.0	7.2		5.8	8.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		6.8			0.2		6.1	0.6		0.8	1.3	
Delay (s)		30.2			20.1		13.1	7.8		6.6	9.6	
Level of Service		C			C		B	A		A	A	
Approach Delay (s)		30.2			20.1			8.2			9.5	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	70.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	10	10	50	10	10	10	11	20	1577	26	20	1602
Sign Control		Stop			Stop				Free			Free
Grade		0%			0%				0%			0%
Peak Hour 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
Hourly flow rate (vph)	10	10	50	10	10	10	0	20	1577	26	20	1602
Pedestrians		10			8				11			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		1			1				1			
Right turn flare (veh)												
Median type									None			None
Median storage veh)												
Upstream signal (ft)									299			294
pX, platoon unblocked	0.85	0.85	0.77	0.85	0.85	0.83	0.00	0.77			0.83	
vC, conflicting volume	2238	3308	560	2278	3300	547	0	1622			1611	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	483	1738	0	531	1729	0	0	747			1009	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			4.1	
tC, 2 stage (s)												
tF (s)	*5.0	*5.0	*5.0	*5.0	*5.0	*5.0	0.0	2.2			2.2	
p0 queue free %	96	85	91	95	85	98	0	97			96	
cM capacity (veh/h)	250	65	542	213	66	592	0	652			566	

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	70	30	414	788	420	420	801	410
Volume Left	10	10	20	0	0	20	0	0
Volume Right	50	10	0	0	26	0	0	10
cSH	245	139	652	1700	1700	566	1700	1700
Volume to Capacity	0.29	0.22	0.03	0.46	0.25	0.04	0.47	0.24
Queue Length 95th (ft)	29	20	2	0	0	3	0	0
Control Delay (s)	25.5	37.8	0.9	0.0	0.0	1.1	0.0	0.0
Lane LOS	D	E	A			A		
Approach Delay (s)	25.5	37.8	0.2			0.3		
Approach LOS	D	E						

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	67.5%	ICU Level of Service	C	
Analysis Period (min)	15			

* User Entered Value

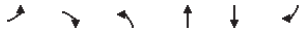
Movement	SBR
Lane Configurations	
Volume (veh/h)	10
Sign Control	
Grade	
Peak Hour Factor	1.00
Hourly flow rate (vph)	10
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	
tC, single (s)	
tC, 2 stage (s)	
tF (s)	
p0 queue free %	
cM capacity (veh/h)	

Direction, Lane #

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	16	10	10	10	10	10	20	20	10	40	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	16	10	10	10	10	10	20	20	10	40	10
Pedestrians		13			19			3			8	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	151	157	61	155	152	57	63			59		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	151	157	61	155	152	57	63			59		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	98	99	99	99	99	99			99		
cM capacity (veh/h)	767	710	996	756	714	992	1536			1533		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	36	30	50	60
Volume Left	10	10	10	10
Volume Right	10	10	20	10
cSH	789	804	1536	1533
Volume to Capacity	0.05	0.04	0.01	0.01
Queue Length 95th (ft)	4	3	0	0
Control Delay (s)	9.8	9.6	1.5	1.3
Lane LOS	A	A	A	A
Approach Delay (s)	9.8	9.6	1.5	1.3
Approach LOS	A	A		

Intersection Summary				
Average Delay	4.5			
Intersection Capacity Utilization	21.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	26	20	523	635	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	26	20	523	635	10
Pedestrians	12			3	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.79	0.79	0.79			
vC, conflicting volume	1217	655	657			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1128	426	428			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	95	98			
cM capacity (veh/h)	174	492	881			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	36	543	645
Volume Left	10	20	0
Volume Right	26	0	10
cSH	326	881	1700
Volume to Capacity	0.11	0.02	0.38
Queue Length 95th (ft)	9	2	0
Control Delay (s)	17.4	0.6	0.0
Lane LOS	C	A	
Approach Delay (s)	17.4	0.6	0.0
Approach LOS	C		

Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	54.7%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
8: MLK Way & 53rd Street

Children's Hospital
DC_2020 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	1	49	60	10	18	30	1616	93	4	1684	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.98			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Frt		0.89			0.97		1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1611			1767		1770	5025		1787	5128	
Flt Permitted		0.95			0.77		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1548			1400		1770	5025		1787	5128	
Peak-hour factor, PHF	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. Flow (vph)	10	1	49	60	10	18	30	1616	93	4	1684	10
RTOR Reduction (vph)	0	40	0	0	13	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	20	0	0	75	0	30	1705	0	4	1694	0
Confl. Peds. (#/hr)	10		17	17		10			17			26
Confl. Bikes (#/hr)									7			17
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		16.7			16.7		4.5	59.0		1.8	56.3	
Effective Green, g (s)		16.7			16.7		4.5	59.0		1.8	56.3	
Actuated g/C Ratio		0.19			0.19		0.05	0.66		0.02	0.63	
Clearance Time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		287			259		88	3294		35	3207	
v/s Ratio Prot							0.02	c0.34		0.00	c0.33	
v/s Ratio Perm		0.01			c0.05							
v/c Ratio		0.07			0.29		0.34	0.52		0.11	0.53	
Uniform Delay, d1		30.2			31.5		41.3	8.1		43.3	9.4	
Progression Factor		1.00			1.00		1.18	0.55		0.51	0.26	
Incremental Delay, d2		0.1			0.6		1.8	0.4		1.1	0.5	
Delay (s)		30.3			32.2		50.3	4.9		23.0	2.9	
Level of Service		C			C		D	A		C	A	
Approach Delay (s)		30.3			32.2			5.7			3.0	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	5.5	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5	
Intersection Capacity Utilization	58.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
9: Dover Street & 53rd Street

Children's Hospital
DC_2020 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	50	30	0	0	20	10	0	0	0	10	0	50
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	50	30	0	0	20	10	0	0	0	10	0	50
Pedestrians		29			28			3			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			2			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	97	102	57	91	127	31	79			28		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	97	102	57	91	127	31	79			28		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	96	100	100	97	99	100			99		
cM capacity (veh/h)	806	750	988	814	727	1022	1495			1561		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	80	30	0	60
Volume Left	50	0	0	10
Volume Right	0	10	0	50
cSH	784	804	1700	1561
Volume to Capacity	0.10	0.04	0.00	0.01
Queue Length 95th (ft)	8	3	0	0
Control Delay (s)	10.1	9.7	0.0	1.3
Lane LOS	B	A		A
Approach Delay (s)	10.1	9.7	0.0	1.3
Approach LOS	B	A		

Intersection Summary				
Average Delay	6.9			
Intersection Capacity Utilization	28.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	59	84	110	91	85	288	60	80	1540	101	36	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.96			1.00	0.97		1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00			0.98	1.00		1.00	1.00			1.00
Frt	1.00	0.91			1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00			0.97	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1772	1650			1778	1537		1787	5074			1787
Flt Permitted	0.58	1.00			0.66	1.00		0.95	1.00			0.95
Satd. Flow (perm)	1087	1650			1199	1537		1787	5074			1787
Peak-hour factor, PHF	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. Flow (vph)	59	84	110	91	85	288	60	80	1540	101	36	162
RTOR Reduction (vph)	0	60	0	0	0	174	0	0	7	0	0	0
Lane Group Flow (vph)	59	134	0	0	176	114	0	140	1634	0	0	198
Confl. Peds. (#/hr)	13		64	64		13				10		
Confl. Bikes (#/hr)			8			7				2		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	23.0	23.0			23.0	23.0		7.5	41.0			12.5
Effective Green, g (s)	23.0	23.0			23.0	23.0		7.5	41.0			12.5
Actuated g/C Ratio	0.26	0.26			0.26	0.26		0.08	0.46			0.14
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	277	421			306	392		148	2311			248
v/s Ratio Prot		0.08						c0.08	c0.32			c0.11
v/s Ratio Perm	0.05				c0.15	0.07						
v/c Ratio	0.21	0.32			0.58	0.29		0.95	0.71			0.80
Uniform Delay, d1	26.4	27.2			29.2	26.9		41.0	19.7			37.5
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.07			0.78
Incremental Delay, d2	0.1	0.2			1.6	0.2		33.1	0.8			13.8
Delay (s)	26.5	27.3			30.9	27.1		74.0	21.8			43.2
Level of Service	C	C			C	C		E	C			D
Approach Delay (s)		27.1			28.5				25.9			
Approach LOS		C			C				C			

Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	104.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: MLK Way & 52nd Street

Children's Hospital
DC_2020 AM Plus Phase 2

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1578	7
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5131	
Flt Permitted	1.00	
Satd. Flow (perm)	5131	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1578	7
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1585	0
Confl. Peds. (#/hr)		13
Confl. Bikes (#/hr)		13
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	45.5	
Effective Green, g (s)	45.5	
Actuated g/C Ratio	0.51	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2594	
v/s Ratio Prot	0.31	
v/s Ratio Perm		
v/c Ratio	0.61	
Uniform Delay, d1	15.9	
Progression Factor	0.79	
Incremental Delay, d2	1.0	
Delay (s)	13.5	
Level of Service	B	
Approach Delay (s)	16.8	
Approach LOS	B	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
11: 52nd Street & Garage

Children's Hospital
DC_2020 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	318	5	2	430	2	7	3	5	0	2	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.94			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.95			0.88	
Flt Protected		1.00			1.00			0.98			1.00	
Satd. Flow (prot)		1853			1897			1437			1655	
Flt Permitted		1.00			1.00			0.95			1.00	
Satd. Flow (perm)		1847			1896			1398			1655	
Peak-hour factor, PHF	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. Flow (vph)	4	318	5	2	430	2	7	3	5	0	2	15
RTOR Reduction (vph)	0	1	0	0	1	0	0	3	0	0	8	0
Lane Group Flow (vph)	0	326	0	0	433	0	0	12	0	0	9	0
Confl. Peds. (#/hr)	23		72	72		23			263	263		
Confl. Bikes (#/hr)			8			7						2
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		21.0			21.0			23.0			23.0	
Effective Green, g (s)		21.0			21.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.42			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		775			796			643			761	
v/s Ratio Prot											0.01	
v/s Ratio Perm		0.18			c0.23			c0.01				
v/c Ratio		0.42			0.54			0.02			0.01	
Uniform Delay, d1		10.2			10.9			7.4			7.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.7			2.7			0.1			0.0	
Delay (s)		11.9			13.6			7.4			7.4	
Level of Service		B			B			A			A	
Approach Delay (s)		11.9			13.6			7.4			7.4	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.27			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	6.0	
Intersection Capacity Utilization	49.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

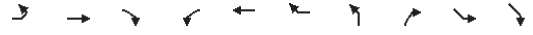
HCM Unsignalized Intersection Capacity Analysis
12: 52nd Street & Dover Street

Children's Hospital
DC_2020 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	12	247	75	45	397	5	36	0	28	2	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	12	247	75	45	397	5	36	0	28	2	0	6
Pedestrians		26			13			16			30	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			1			1			3	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.85			0.88			0.91	0.91	0.88	0.91	0.91	0.85
vC, conflicting volume	432			338			846	846	314	869	882	456
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	247			184			493	494	156	518	532	275
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	99			96			91	100	96	99	100	99
cM capacity (veh/h)	1091			1217			386	388	749	373	381	625

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	334	447	64	8
Volume Left	12	45	36	2
Volume Right	75	5	28	6
cSH	1091	1217	490	535
Volume to Capacity	0.01	0.04	0.13	0.01
Queue Length 95th (ft)	1	3	11	1
Control Delay (s)	0.4	1.2	13.4	11.8
Lane LOS	A	A	B	B
Approach Delay (s)	0.4	1.2	13.4	11.8
Approach LOS			B	B

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	56.9%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	283	0	0	456	1141	0	970	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	283	0	0	456	1141	0	970	0	0
Pedestrians							32			
Lane Width (ft)							12.0			
Walking Speed (ft/s)							4.0			
Percent Blockage							3			
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.80						0.80		0.80	0.80
vC, conflicting volume	1597			315			1912	174	1568	771
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1256			315			1648	174	1220	230
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	442			1209			77	814	0	524

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	142	142	304	532	761	485	485
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	380	761	485	485
cSH	1700	1700	1700	1700	1700	814	814
Volume to Capacity	0.08	0.08	0.18	0.31	0.45	0.60	0.60
Queue Length 95th (ft)	0	0	0	0	0	101	101
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	15.7	15.7
Lane LOS						C	C
Approach Delay (s)	0.0		0.0			15.7	
Approach LOS						C	

Intersection Summary				
Average Delay	5.3			
Intersection Capacity Utilization	52.0%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	50	293	750	160	40	981	110	170	130	40	115	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.99		1.00	1.00		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.97		1.00	0.98		1.00	0.96			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.98
Satd. Flow (prot)		1787	4933		1805	5087		1752	1766			1732
Flt Permitted		0.95	1.00		0.95	1.00		0.39	1.00			0.79
Satd. Flow (perm)		1787	4933		1805	5087		713	1766			1392
Peak-hour factor, PHF	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. Flow (vph)	50	293	750	160	40	981	110	170	130	40	115	160
RTOR Reduction (vph)	0	0	32	0	0	15	0	0	13	0	0	0
Lane Group Flow (vph)	0	343	878	0	40	1076	0	170	157	0	0	275
Confl. Peds. (#/hr)				16			7			13	13	
Confl. Bikes (#/hr)				16			2			13		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		21.5	35.0		5.1	18.6		35.9	35.9			25.4
Effective Green, g (s)		21.5	35.0		5.1	18.6		35.9	35.9			25.4
Actuated g/C Ratio		0.24	0.39		0.06	0.21		0.40	0.40			0.28
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		426	1918		102	1051		359	704			392
v/s Ratio Prot		c0.19	0.18		0.02	c0.21		c0.03	0.09			
v/s Ratio Perm								0.15				c0.20
v/c Ratio		0.81	0.46		0.39	1.02		0.47	0.22			0.70
Uniform Delay, d1		32.3	20.4		41.0	35.7		18.7	17.9			28.9
Progression Factor		1.00	1.00		1.14	0.86		1.00	1.00			1.00
Incremental Delay, d2		14.9	0.8		1.9	30.6		1.0	0.7			10.0
Delay (s)		47.2	21.2		48.5	61.1		19.7	18.6			38.9
Level of Service		D	C		D	E		B	B			D
Approach Delay (s)			28.3			60.7			19.1			31.9
Approach LOS			C			E			B			C

Intersection Summary				
HCM 2000 Control Delay	38.9	HCM 2000 Level of Service		D
HCM 2000 Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		18.0
Intersection Capacity Utilization	105.8%	ICU Level of Service		G
Analysis Period (min)	15			

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	396
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.93
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1398
Flt Permitted	1.00
Satd. Flow (perm)	1398
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	396
RTOR Reduction (vph)	284
Lane Group Flow (vph)	112
Confl. Peds. (#/hr)	21
Confl. Bikes (#/hr)	54
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	25.4
Effective Green, g (s)	25.4
Actuated g/C Ratio	0.28
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	394
v/s Ratio Prot	
v/s Ratio Perm	0.08
v/c Ratio	0.28
Uniform Delay, d1	25.2
Progression Factor	1.00
Incremental Delay, d2	1.8
Delay (s)	27.0
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	10	110	60	180	10	780	130	90	700	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.98			0.99		1.00	0.96	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.95		1.00	0.89			0.98		1.00	0.95	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1641		1698	1565			3849		1770	3232	
Flt Permitted		0.98		0.95	1.00			0.94		0.95	1.00	
Satd. Flow (perm)		1641		1698	1565			3625		1770	3232	
Peak-hour factor, PHF	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. Flow (vph)	10	10	10	110	60	180	10	780	130	90	700	360
RTOR Reduction (vph)	0	10	0	0	119	0	0	11	0	0	51	0
Lane Group Flow (vph)	0	21	0	99	132	0	0	909	0	90	1009	0
Confl. Peds. (#/hr)	6					6	29		24			29
Confl. Bikes (#/hr)			2			3			43			36
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		4.5		15.7	15.7			43.9		7.9	56.3	
Effective Green, g (s)		4.5		15.7	15.7			43.9		7.9	56.3	
Actuated g/C Ratio		0.05		0.17	0.17			0.49		0.09	0.63	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		82		296	273			1768		155	2021	
v/s Ratio Prot		c0.01		0.06	c0.08					0.05	c0.31	
v/s Ratio Perm								0.25				
v/c Ratio		0.25		0.33	0.48			0.51		0.58	0.50	
Uniform Delay, d1		41.1		32.6	33.5			15.8		39.5	9.2	
Progression Factor		1.56		1.00	1.00			0.97		1.00	1.00	
Incremental Delay, d2		1.0		0.7	1.4			0.9		5.4	0.9	
Delay (s)		65.3		33.2	34.8			16.1		44.9	10.1	
Level of Service		E		C	C			B		D	B	
Approach Delay (s)		65.3			34.4			16.1			12.8	
Approach LOS		E			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
16: Telegraph Ave & 51St Street

Children's Hospital
DC_2020 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	270	532	83	120	564	270	117	380	70	180	590	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.98		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3401		1787	3323		1719	3313		1752	3433	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3401		1787	3323		1719	3313		1752	3433	
Peak-hour factor, PHF	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. Flow (vph)	270	532	83	120	564	270	117	380	70	180	590	50
RTOR Reduction (vph)	0	14	0	0	63	0	0	16	0	0	6	0
Lane Group Flow (vph)	270	601	0	120	771	0	117	434	0	180	634	0
Confl. Peds. (#/hr)			41			41			39			49
Confl. Bikes (#/hr)			12			10			36			36
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	12.0	27.0		10.4	25.9		9.0	24.5		11.6	28.1	
Effective Green, g (s)	12.0	27.0		10.4	25.9		9.0	24.5		11.6	28.1	
Actuated g/C Ratio	0.13	0.30		0.12	0.29		0.10	0.27		0.13	0.31	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	453	1020		206	956		171	901		225	1071	
v/s Ratio Prot	c0.08	0.18		0.07	c0.23		0.07	0.13		c0.10	c0.18	
v/s Ratio Perm												
v/c Ratio	0.60	0.59		0.58	0.81		0.68	0.48		0.80	0.59	
Uniform Delay, d1	36.7	26.8		37.7	29.7		39.1	27.4		38.1	26.1	
Progression Factor	1.24	0.93		1.00	1.00		1.00	1.00		1.29	0.74	
Incremental Delay, d2	1.9	2.2		4.2	7.2		10.8	1.8		16.6	2.2	
Delay (s)	47.3	27.1		41.9	36.9		49.9	29.3		65.5	21.4	
Level of Service	D	C		D	D		D	C		E	C	
Approach Delay (s)		33.3			37.6			33.5			31.1	
Approach LOS		C			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	34.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	75.1%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
17: SB SR-24 On-Ramp & MLK Way & NB SR-24 Off-Ramp

Children's Hospital
DC_2020 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	193	0	0	0	0	1584	0	0	0	0	1537	252
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	193	0	0	0	0	1584	0	0	0	0	1537	252
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	193	0	0	0	0	1584	0	0	0	0	1537	252
Confl. Peds. (#/hr)				8								
Confl. Bikes (#/hr)									3			
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	8.0					45.0					29.0	45.0
Effective Green, g (s)	8.0					45.0					29.0	45.0
Actuated g/C Ratio	0.18					1.00					0.64	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	581					1627					2303	2814
v/s Ratio Prot	0.06										0.43	0.09
v/s Ratio Perm						c0.97						
v/c Ratio	0.33					0.97					0.67	0.09
Uniform Delay, d1	16.2					0.0					5.0	0.0
Progression Factor	1.00					1.00					1.79	1.00
Incremental Delay, d2	1.5					16.9					1.3	0.1
Delay (s)	17.7					16.9					10.2	0.1
Level of Service	B					B					B	A
Approach Delay (s)		17.7			16.9			0.0			8.8	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	1.18			
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	54.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	173	20	70	102	0	30	0	80	10	50	10
Peak Hour 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
Hourly flow rate (vph)	0	173	20	70	102	0	30	0	80	10	50	10

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	193	172	30	80	70
Volume Left (vph)	0	70	30	0	10
Volume Right (vph)	20	0	0	80	10
Hadj (s)	-0.05	0.12	0.50	-0.70	-0.02
Departure Headway (s)	4.5	4.7	6.0	4.7	5.0
Degree Utilization, x	0.24	0.22	0.05	0.11	0.10
Capacity (veh/h)	763	727	565	700	658
Control Delay (s)	9.0	9.1	8.1	7.1	8.5
Approach Delay (s)	9.0	9.1	7.4		8.5
Approach LOS	A	A	A		A

Intersection Summary					
Delay			8.6		
Level of Service			A		
Intersection Capacity Utilization			41.6%	ICU Level of Service	A
Analysis Period (min)			15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	163	10	10	102	30	10	10	10	20	10	10
Peak Hour 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
Hourly flow rate (vph)	10	163	10	10	102	30	10	10	10	20	10	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	183	142	30	40
Volume Left (vph)	10	10	10	20
Volume Right (vph)	10	30	10	10
Hadj (s)	0.00	-0.11	-0.13	-0.05
Departure Headway (s)	4.2	4.1	4.5	4.6
Degree Utilization, x	0.21	0.16	0.04	0.05
Capacity (veh/h)	835	847	734	720
Control Delay (s)	8.3	7.9	7.7	7.8
Approach Delay (s)	8.3	7.9	7.7	7.8
Approach LOS	A	A	A	A

Intersection Summary					
Delay			8.1		
Level of Service			A		
Intersection Capacity Utilization			24.2%	ICU Level of Service	A
Analysis Period (min)			15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	370	10	10	360	20	10	20	20	40	20	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	370	10	10	360	20	10	20	20	40	20	10
Pedestrians		11			3			13			15	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	395			393			829	823	391	833	818	396
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	395			393			829	823	391	833	818	396
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			96	93	97	84	93	98
cM capacity (veh/h)	1154			1164			259	298	653	253	298	639

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	390	390	50	70
Volume Left	10	10	10	40
Volume Right	10	20	20	10
cSH	1154	1164	367	291
Volume to Capacity	0.01	0.01	0.14	0.24
Queue Length 95th (ft)	1	1	12	23
Control Delay (s)	0.3	0.3	16.3	21.3
Lane LOS	A	A	C	C
Approach Delay (s)	0.3	0.3	16.3	21.3
Approach LOS			C	C

Intersection Summary				
Average Delay	2.8			
Intersection Capacity Utilization	42.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	34	1712	201	0	1793
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	34	1712	201	0	1793
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			154			137
pX, platoon unblocked	0.84	0.74			0.74	
vC, conflicting volume	2410	671			1913	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	501	0			1019	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	417	806			503	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	34	685	685	543	598	598	598
Volume Left	0	0	0	0	0	0	0
Volume Right	34	0	0	201	0	0	0
cSH	806	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.04	0.40	0.40	0.32	0.35	0.35	0.35
Queue Length 95th (ft)	3	0	0	0	0	0	0
Control Delay (s)	9.7	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	9.7	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	47.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	1777	0	0	1839
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	1777	0	0	1839
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			424			204
pX, platoon unblocked	0.78					
vC, conflicting volume	2390	592			1777	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1789	592			1777	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	56	449			346	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	0	711	711	355	613	613	613
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.42	0.42	0.21	0.36	0.36	0.36
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	0.0	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	38.9%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	20	260	170	60	170	70	29	211	1663	156	130	1354
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			0.99			1.00	0.99		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.95			0.97			1.00	0.99		1.00	1.00
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1751			1735			1770	4980		1770	5060
Flt Permitted		0.98			0.67			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1718			1181			1770	4980		1770	5060
Peak-hour factor, PHF	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. Flow (vph)	20	260	170	60	170	70	29	211	1663	156	130	1354
RTOR Reduction (vph)	0	24	0	0	12	0	0	0	10	0	0	2
Lane Group Flow (vph)	0	426	0	0	288	0	0	240	1809	0	130	1382
Confl. Peds. (#/hr)	15		20	20		15				26		
Confl. Bikes (#/hr)			21			16				20		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		29.3			29.3			21.5	45.5		10.7	34.7
Effective Green, g (s)		29.3			29.3			21.5	45.5		10.7	34.7
Actuated g/C Ratio		0.29			0.29			0.22	0.46		0.11	0.35
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		503			346			380	2265		189	1755
v/s Ratio Prot								0.14	c0.36		0.07	c0.27
v/s Ratio Perm		c0.25			0.24							
v/c Ratio		0.85			0.83			0.63	0.80		0.69	0.79
Uniform Delay, d1		33.2			33.1			35.7	23.3		43.0	29.3
Progression Factor		1.00			1.00			0.55	0.40		1.00	1.00
Incremental Delay, d2		12.5			15.6			2.8	2.5		10.0	3.7
Delay (s)		45.7			48.6			22.3	11.9		53.0	33.0
Level of Service		D			D			C	B		D	C
Approach Delay (s)		45.7			48.6				13.1			34.7
Approach LOS		D			D				B			C

Intersection Summary			
HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	94.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	30
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	30
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	16
Confl. Bikes (#/hr)	20
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis
2: Dover Street & 55th Street

Children's Hospital
DC_2020 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	496	20	10	230	20	20	20	30	20	20	40
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	496	20	10	230	20	20	20	30	20	20	40
Pedestrians		6			17			10			23	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked				0.96			0.96	0.96	0.96	0.96	0.96	
vC, conflicting volume	273			526			892	869	533	906	869	269
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	273			482			864	840	489	879	840	269
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			91	93	94	90	93	95
cM capacity (veh/h)	1249			1015			222	273	545	210	270	749

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	546	260	70	80
Volume Left	30	10	20	20
Volume Right	20	20	30	40
cSH	1249	1015	321	359
Volume to Capacity	0.02	0.01	0.22	0.22
Queue Length 95th (ft)	2	1	20	21
Control Delay (s)	0.7	0.4	19.3	17.9
Lane LOS	A	A	C	C
Approach Delay (s)	0.7	0.4	19.3	17.9
Approach LOS			C	C

Intersection Summary				
Average Delay	3.4			
Intersection Capacity Utilization	55.2%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
DC_2020 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	386	60	32	160	50	50	560	46	30	550	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.99			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.97			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		1752			1760			1830			1853	
Flt Permitted		0.91			0.91			0.92			0.95	
Satd. Flow (perm)		1601			1604			1694			1773	
Peak-hour factor, PHF	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. Flow (vph)	90	386	60	32	160	50	50	560	46	30	550	40
RTOR Reduction (vph)	0	6	0	0	11	0	0	3	0	0	3	0
Lane Group Flow (vph)	0	530	0	0	231	0	0	653	0	0	617	0
Confl. Peds. (#/hr)	15		15	15		15	25		10	10		25
Confl. Bikes (#/hr)			20			13			41			29
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		29.0			29.0			43.0			43.0	
Effective Green, g (s)		29.0			29.0			43.0			43.0	
Actuated g/C Ratio		0.36			0.36			0.54			0.54	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		580			581			910			952	
v/s Ratio Prot												
v/s Ratio Perm		c0.33			0.14			c0.39			0.35	
v/c Ratio		0.91			0.40			0.72			0.65	
Uniform Delay, d1		24.3			19.0			13.9			13.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		21.3			2.0			4.8			3.4	
Delay (s)		45.6			21.0			18.8			16.5	
Level of Service		D			C			B			B	
Approach Delay (s)		45.6			21.0			18.8			16.5	
Approach LOS		D			C			B			B	

Intersection Summary					
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C		
HCM 2000 Volume to Capacity ratio	0.80				
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0		
Intersection Capacity Utilization	99.7%	ICU Level of Service	F		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
DC_2020 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	301	30	121	50	20	20	90	1006	70	20	996	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.98			0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes		0.99			0.99		0.99	1.00		0.99	1.00	
Frt		0.96			0.97		1.00	0.99		1.00	0.98	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1645			1697		1752	3482		1774	3471	
Flt Permitted		0.76			0.74		0.17	1.00		0.18	1.00	
Satd. Flow (perm)		1298			1284		320	3482		343	3471	
Peak-hour factor, PHF	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. Flow (vph)	301	30	121	50	20	20	90	1006	70	20	996	112
RTOR Reduction (vph)	0	15	0	0	12	0	0	5	0	0	9	0
Lane Group Flow (vph)	0	437	0	0	78	0	90	1071	0	20	1099	0
Confl. Peds. (#/hr)	15		34	34		15	33		23	23		33
Confl. Bikes (#/hr)			11			12			38			59
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		33.0			33.0		48.0	48.0		48.0	48.0	
Effective Green, g (s)		33.0			33.0		48.0	48.0		48.0	48.0	
Actuated g/C Ratio		0.37			0.37		0.53	0.53		0.53	0.53	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		475			470		170	1857		182	1851	
v/s Ratio Prot								0.31			c0.32	
v/s Ratio Perm		c0.34			0.06		0.28			0.06		
v/c Ratio		0.92			0.17		0.53	0.58		0.11	0.59	
Uniform Delay, d1		27.2			19.2		13.7	14.2		10.4	14.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		22.8			0.2		11.3	1.3		1.2	1.4	
Delay (s)		50.0			19.4		25.0	15.5		11.6	15.8	
Level of Service		D			B		C	B		B	B	
Approach Delay (s)		50.0			19.4			16.2			15.7	
Approach LOS		D			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	80.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
5: MLK Way & 54th Street

Children's Hospital
DC_2020 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (veh/h)	10	10	50	20	10	10	13	40	2001	48	10	20
Sign Control		Stop			Stop				Free			
Grade		0%			0%				0%			
Peak Hour 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
Hourly flow rate (vph)	10	10	50	20	10	10	0	40	2001	48	0	20
Pedestrians		7			25				15			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		1			2				1			
Right turn flare (veh)												
Median type									None			
Median storage veh)												
Upstream signal (ft)									299			
pX, platoon unblocked	0.87	0.87	0.76	0.87	0.87	0.75	0.00	0.76			0.00	0.75
vC, conflicting volume	2372	3764	550	2758	3750	716	0	1580			0	2074
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	197	1789	0	638	1773	0	0	648			0	1279
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			0.0	4.1
tC, 2 stage (s)												
tF (s)	*5.0	*5.0	*5.0	*5.0	*5.0	*5.0	0.0	2.2			0.0	2.2
p0 queue free %	97	83	91	88	83	98	0	94			0	95
cM capacity (veh/h)	368	59	536	173	60	531	0	704			0	401

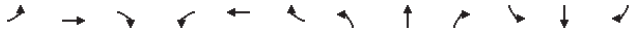
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	70	40	540	1000	548	408	776	408
Volume Left	10	20	40	0	0	20	0	0
Volume Right	50	10	0	0	48	0	0	20
cSH	241	133	704	1700	1700	401	1700	1700
Volume to Capacity	0.29	0.30	0.06	0.59	0.32	0.05	0.46	0.24
Queue Length 95th (ft)	29	29	5	0	0	4	0	0
Control Delay (s)	25.9	43.3	1.5	0.0	0.0	1.6	0.0	0.0
Lane LOS	D	E	A			A		
Approach Delay (s)	25.9	43.3	0.4			0.4		
Approach LOS	D	E						

Intersection Summary				
Average Delay	1.3			
Intersection Capacity Utilization	90.4%	ICU Level of Service	E	
Analysis Period (min)	15			

* User Entered Value

Movement	SBT	SBR
Lane Configurations		
Volume (veh/h)	1553	20
Sign Control	Free	
Grade	0%	
Peak Hour Factor	1.00	1.00
Hourly flow rate (vph)	1553	20
Pedestrians		
Lane Width (ft)		
Walking Speed (ft/s)		
Percent Blockage		
Right turn flare (veh)		
Median type	None	
Median storage veh)		
Upstream signal (ft)	294	
pX, platoon unblocked		
vC, conflicting volume		
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol		
tC, single (s)		
tC, 2 stage (s)		
tF (s)		
p0 queue free %		
cM capacity (veh/h)		

Direction, Lane #



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	48	10	10	10	20	10	40	10	10	30	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	48	10	10	10	20	10	40	10	10	30	10
Pedestrians		16			11			8			4	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	165	152	59	173	152	60	56			61		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	165	152	59	173	152	60	56			61		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	93	99	99	99	98	99			99		
cM capacity (veh/h)	746	717	992	715	717	999	1541			1541		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	68	40	60	50
Volume Left	10	10	10	10
Volume Right	10	20	10	10
cSH	752	834	1541	1541
Volume to Capacity	0.09	0.05	0.01	0.01
Queue Length 95th (ft)	7	4	0	0
Control Delay (s)	10.3	9.5	1.3	1.5
Lane LOS	B	A	A	A
Approach Delay (s)	10.3	9.5	1.3	1.5
Approach LOS	B	A		

Intersection Summary				
Average Delay	5.6			
Intersection Capacity Utilization	21.2%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
7: Shattuck Ave & 54th Street

Children's Hospital
DC_2020 PM Plus Phase 2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	48	20	666	652	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	48	20	666	652	10
Pedestrians	33				2	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	3				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.82	0.77	0.77			
vC, conflicting volume	1398	690	695			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1096	446	453			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	90	98			
cM capacity (veh/h)	185	461	828			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	58	686	662
Volume Left	10	20	0
Volume Right	48	0	10
cSH	366	828	1700
Volume to Capacity	0.16	0.02	0.39
Queue Length 95th (ft)	14	2	0
Control Delay (s)	16.7	0.6	0.0
Lane LOS	C	A	
Approach Delay (s)	16.7	0.6	0.0
Approach LOS	C		

Intersection Summary			
Average Delay		1.0	
Intersection Capacity Utilization		61.4%	ICU Level of Service B
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
8: MLK Way & 53rd Street

Children's Hospital
DC_2020 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	10	4	69	70	10	8	10	10	2084	105	4	1647
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			1.00			1.00	0.99		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.89			0.99			1.00	0.99		1.00	1.00
Flt Protected		0.99			0.96			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1610			1795			1770	5013		1787	5128
Flt Permitted		0.96			0.73			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1562			1361			1770	5013		1787	5128
Peak-hour factor, PHF	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. Flow (vph)	10	4	69	70	10	8	10	10	2084	105	4	1647
RTOR Reduction (vph)	0	57	0	0	4	0	0	0	3	0	0	0
Lane Group Flow (vph)	0	26	0	0	84	0	0	20	2186	0	4	1657
Confl. Peds. (#/hr)	11		6	6		11				42		
Confl. Bikes (#/hr)			6			3				17		
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		17.3			17.3			3.1	68.4		1.8	67.1
Effective Green, g (s)		17.3			17.3			3.1	68.4		1.8	67.1
Actuated g/C Ratio		0.17			0.17			0.03	0.68		0.02	0.67
Clearance Time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		270			235			54	3428		32	3440
v/s Ratio Prot								0.01	c0.44		0.00	c0.32
v/s Ratio Perm		0.02			c0.06							
v/c Ratio		0.10			0.36			0.37	0.64		0.12	0.48
Uniform Delay, d1		34.8			36.4			47.5	8.9		48.3	8.0
Progression Factor		1.00			1.02			1.43	0.23		0.78	0.48
Incremental Delay, d2		0.2			0.9			2.8	0.6		1.2	0.3
Delay (s)		34.9			38.0			70.7	2.7		38.7	4.2
Level of Service		C			D			E	A		D	A
Approach Delay (s)		34.9			38.0				3.3			4.3
Approach LOS		C			D				A			A

Intersection Summary			
HCM 2000 Control Delay	5.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	10
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	10
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	19
Confl. Bikes (#/hr)	21
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	60	20	0	0	20	10	0	0	0	10	0	40
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	60	20	0	0	20	10	0	0	0	10	0	40
Pedestrians		33			13			6			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	99	86	59	69	106	19	73			13		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	99	86	59	69	106	19	73			13		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	97	100	100	97	99	100			99		
cM capacity (veh/h)	805	772	980	865	753	1048	1497			1601		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	80	30	0	50
Volume Left	60	0	0	10
Volume Right	0	10	0	40
cSH	797	831	1700	1601
Volume to Capacity	0.10	0.04	0.00	0.01
Queue Length 95th (ft)	8	3	0	0
Control Delay (s)	10.0	9.5	0.0	1.5
Lane LOS	B	A		A
Approach Delay (s)	10.0	9.5	0.0	1.5
Approach LOS	B	A		

Intersection Summary				
Average Delay	7.3			
Intersection Capacity Utilization	28.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	88	113	100	149	99	272	50	90	1757	106	4	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.95			1.00	0.96		1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00			0.97	1.00		1.00	1.00			1.00
Frt	1.00	0.93			1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00			0.97	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1764	1669			1751	1525		1787	5071			1787
Flt Permitted	0.45	1.00			0.57	1.00		0.95	1.00			0.95
Satd. Flow (perm)	841	1669			1030	1525		1787	5071			1787
Peak-hour factor, PHF	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. Flow (vph)	88	113	100	149	99	272	50	90	1757	106	4	210
RTOR Reduction (vph)	0	34	0	0	0	199	0	0	6	0	0	0
Lane Group Flow (vph)	88	179	0	0	248	73	0	140	1857	0	0	214
Confl. Peds. (#/hr)	21		80	80		21				13		
Confl. Bikes (#/hr)			12			6				20		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	26.7	26.7			26.7	26.7		12.0	42.3			17.5
Effective Green, g (s)	26.7	26.7			26.7	26.7		12.0	42.3			17.5
Actuated g/C Ratio	0.27	0.27			0.27	0.27		0.12	0.42			0.18
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	224	445			275	407		214	2145			312
v/s Ratio Prot		0.11						0.08	c0.37			0.12
v/s Ratio Perm	0.10				c0.24	0.05						
v/c Ratio	0.39	0.40			0.90	0.18		0.65	0.87			0.69
Uniform Delay, d1	30.0	30.1			35.4	28.2		42.0	26.3			38.7
Progression Factor	1.00	1.00			0.90	2.07		0.97	1.06			0.62
Incremental Delay, d2	0.4	0.2			27.3	0.1		2.1	2.0			4.5
Delay (s)	30.4	30.3			59.0	58.3		42.6	29.8			28.6
Level of Service	C	C			E	E		D	C			C
Approach Delay (s)		30.4			58.6				30.7			
Approach LOS		C			E				C			

Intersection Summary			
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	111.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: MLK Way & 52nd Street

Children's Hospital
DC_2020 PM Plus Phase 2

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1568	14
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5125	
Flt Permitted	1.00	
Satd. Flow (perm)	5125	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1568	14
RTOR Reduction (vph)	1	0
Lane Group Flow (vph)	1581	0
Confl. Peds. (#/hr)		17
Confl. Bikes (#/hr)		23
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	47.3	
Effective Green, g (s)	47.3	
Actuated g/C Ratio	0.47	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2424	
v/s Ratio Prot	c0.31	
v/s Ratio Perm		
v/c Ratio	0.65	
Uniform Delay, d1	20.1	
Progression Factor	0.33	
Incremental Delay, d2	1.3	
Delay (s)	7.9	
Level of Service	A	
Approach Delay (s)	10.3	
Approach LOS	B	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
11: 52nd Street & Garage

Children's Hospital
DC_2020 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	413	5	2	437	2	12	1	7	0	4	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.94			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.95			0.87	
Flt Protected		1.00			1.00			0.97			1.00	
Satd. Flow (prot)		1855			1897			1417			1640	
Flt Permitted		1.00			1.00			0.92			1.00	
Satd. Flow (perm)		1852			1895			1339			1640	
Peak-hour factor, PHF	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. Flow (vph)	3	413	5	2	437	2	12	1	7	0	4	59
RTOR Reduction (vph)	0	1	0	0	1	0	0	4	0	0	32	0
Lane Group Flow (vph)	0	420	0	0	440	0	0	16	0	0	31	0
Confl. Peds. (#/hr)			77	77		33			271	271		
Confl. Bikes (#/hr)			13			8						2
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		21.0			21.0			23.0			23.0	
Effective Green, g (s)		21.0			21.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.42			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		777			795			615			754	
v/s Ratio Prot											c0.02	
v/s Ratio Perm		0.23			c0.23			0.01				
v/c Ratio		0.54			0.55			0.03			0.04	
Uniform Delay, d1		10.9			11.0			7.4			7.4	
Progression Factor		1.49			1.00			1.00			1.00	
Incremental Delay, d2		2.0			2.8			0.1			0.1	
Delay (s)		18.2			13.7			7.5			7.5	
Level of Service		B			B			A			A	
Approach Delay (s)		18.2			13.7			7.5			7.5	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.29			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	6.0	
Intersection Capacity Utilization	50.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
12: 52nd Street & Dover Street

Children's Hospital
DC_2020 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	375	46	21	372	4	72	0	50	10	0	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	8	375	46	21	372	4	72	0	50	10	0	14
Pedestrians		49			10			46			20	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		4			1			4			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.88			0.83			0.89	0.89	0.83	0.89	0.89	0.88
vC, conflicting volume	396			467			939	898	454	910	919	443
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	245			253			563	517	237	530	541	298
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	99			98			77	100	92	97	100	98
cM capacity (veh/h)	1138			1050			320	369	618	346	369	619

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	429	397	122	24
Volume Left	8	21	72	10
Volume Right	46	4	50	14
cSH	1138	1050	398	466
Volume to Capacity	0.01	0.02	0.31	0.05
Queue Length 95th (ft)	1	2	32	4
Control Delay (s)	0.2	0.7	18.0	13.2
Lane LOS	A	A	C	B
Approach Delay (s)	0.2	0.7	18.0	13.2
Approach LOS			C	B

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	49.4%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
13: SR-24 NB Off-Ramp & 52nd Street

Children's Hospital
DC_2020 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	433	0	0	402	1067	0	1050	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	433	0	0	402	1067	0	1050	0	0
Pedestrians							43			
Lane Width (ft)							12.0			
Walking Speed (ft/s)							4.0			
Percent Blockage							4			
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.81						0.81		0.81	0.81
vC, conflicting volume	1469			476			1945	260	1668	878
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1121			476			1705	260	1366	396
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	504			1044			71	710	0	424

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	216	216	268	490	711	525	525
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	356	711	525	525
cSH	1700	1700	1700	1700	1700	710	710
Volume to Capacity	0.13	0.13	0.16	0.29	0.42	0.74	0.74
Queue Length 95th (ft)	0	0	0	0	0	166	166
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	23.0	23.0
Lane LOS						C	C
Approach Delay (s)	0.0		0.0			23.0	
Approach LOS						C	

Intersection Summary				
Average Delay	8.2			
Intersection Capacity Utilization	56.4%	ICU Level of Service		B
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
14: 52nd Street & Shattuck Ave

Children's Hospital
DC_2020 PM Plus Phase 2

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	50	326	917	190	60	890	150	160	240	60	171	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.98		1.00	0.99		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			0.99
Frt		1.00	0.97		1.00	0.98		1.00	0.97			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.97
Satd. Flow (prot)		1787	4924		1805	5014		1752	1764			1708
Flt Permitted		0.95	1.00		0.95	1.00		0.25	1.00			0.68
Satd. Flow (perm)		1787	4924		1805	5014		467	1764			1193
Peak-hour factor, PHF	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. Flow (vph)	50	326	917	190	60	890	150	160	240	60	171	150
RTOR Reduction (vph)	0	0	28	0	0	21	0	0	8	0	0	0
Lane Group Flow (vph)	0	376	1079	0	60	1019	0	160	292	0	0	321
Confl. Peds. (#/hr)				19	19		15			29	29	
Confl. Bikes (#/hr)				17			11			39		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		33.5	55.1		5.2	26.8		35.7	35.7			26.2
Effective Green, g (s)		33.5	55.1		5.2	26.8		35.7	35.7			26.2
Actuated g/C Ratio		0.30	0.50		0.05	0.24		0.32	0.32			0.24
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		544	2466		85	1221		215	572			284
v/s Ratio Prot		c0.21	0.22		0.03	c0.20		c0.04	0.17			
v/s Ratio Perm								0.20				c0.27
v/c Ratio		0.69	0.44		0.71	0.83		0.74	0.51			1.13
Uniform Delay, d1		33.7	17.5		51.6	39.5		32.8	30.1			41.9
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Incremental Delay, d2		7.0	0.6		23.3	6.8		13.0	3.2			93.2
Delay (s)		40.7	18.1		75.0	46.3		45.8	33.3			135.1
Level of Service		D	B		E	D		D	C			F
Approach Delay (s)			23.8			47.9			37.6			82.1
Approach LOS			C			D			D			F

Intersection Summary				
HCM 2000 Control Delay	43.4	HCM 2000 Level of Service		D
HCM 2000 Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		18.0
Intersection Capacity Utilization	105.4%	ICU Level of Service		G
Analysis Period (min)	15			

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	369
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.93
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1400
Flt Permitted	1.00
Satd. Flow (perm)	1400
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	369
RTOR Reduction (vph)	281
Lane Group Flow (vph)	88
Confl. Peds. (#/hr)	24
Confl. Bikes (#/hr)	36
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	26.2
Effective Green, g (s)	26.2
Actuated g/C Ratio	0.24
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	333
v/s Ratio Prot	
v/s Ratio Perm	0.06
v/c Ratio	0.26
Uniform Delay, d1	34.1
Progression Factor	1.00
Incremental Delay, d2	1.9
Delay (s)	36.0
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	20	20	140	80	180	20	976	270	140	721	306
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.94			0.98		1.00	0.91	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.95		1.00	0.90			0.97		1.00	0.96	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1642		1698	1513			3773		1770	3083	
Flt Permitted		0.98		0.95	1.00			0.93		0.95	1.00	
Satd. Flow (perm)		1642		1698	1513			3499		1770	3083	
Peak-hour factor, PHF	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. Flow (vph)	20	20	20	140	80	180	20	976	270	140	721	306
RTOR Reduction (vph)	0	19	0	0	73	0	0	21	0	0	40	0
Lane Group Flow (vph)	0	41	0	126	201	0	0	1245	0	140	987	0
Confl. Peds. (#/hr)	45					45	91		29			91
Confl. Bikes (#/hr)			2			13			46			63
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		6.2		18.0	18.0			45.9		11.9	62.3	
Effective Green, g (s)		6.2		18.0	18.0			45.9		11.9	62.3	
Actuated g/C Ratio		0.06		0.18	0.18			0.46		0.12	0.62	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		101		305	272			1606		210	1920	
v/s Ratio Prot		c0.03		0.07	c0.13					c0.08	0.32	
v/s Ratio Perm								c0.36				
v/c Ratio		0.41		0.41	0.74			0.78		0.67	0.51	
Uniform Delay, d1		45.1		36.3	38.8			22.7		42.2	10.5	
Progression Factor		1.80		1.00	1.00			0.57		1.00	1.00	
Incremental Delay, d2		1.2		0.9	10.0			2.5		7.8	1.0	
Delay (s)		82.7		37.2	48.8			15.4		49.9	11.4	
Level of Service		F		D	D			B		D	B	
Approach Delay (s)		82.7			45.2			15.4			16.1	
Approach LOS		F			D			B			B	

Intersection Summary					
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.72				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		18.0	
Intersection Capacity Utilization	100.3%	ICU Level of Service		G	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
16: Telegraph Ave & 51St Street

Children's Hospital
DC_2020 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	336	664	108	70	521	240	103	690	120	280	541	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.97		1.00	0.98		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3377		1787	3299		1719	3293		1752	3363	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3377		1787	3299		1719	3293		1752	3363	
Peak-hour factor, PHF	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. Flow (vph)	336	664	108	70	521	240	103	690	120	280	541	60
RTOR Reduction (vph)	0	13	0	0	53	0	0	14	0	0	9	0
Lane Group Flow (vph)	336	759	0	70	708	0	103	796	0	280	592	0
Confl. Peds. (#/hr)			68			50			75			120
Confl. Bikes (#/hr)			11			20			45			71
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.6	29.5		8.0	23.4		8.2	33.0		13.0	38.8	
Effective Green, g (s)	14.6	29.5		8.0	23.4		8.2	33.0		13.0	38.8	
Actuated g/C Ratio	0.15	0.29		0.08	0.23		0.08	0.33		0.13	0.39	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	496	996		142	771		140	1086		227	1304	
v/s Ratio Prot	c0.10	0.22		0.04	c0.21		0.06	c0.24		c0.16	0.18	
v/s Ratio Perm												
v/c Ratio	0.68	0.76		0.49	0.92		0.74	0.73		1.23	0.45	
Uniform Delay, d1	40.5	32.1		44.1	37.4		44.8	29.6		43.5	22.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.22	0.70	
Incremental Delay, d2	3.7	5.5		2.7	17.7		18.1	4.4		134.1	1.0	
Delay (s)	44.1	37.6		46.7	55.1		62.9	34.0		187.0	16.9	
Level of Service	D	D		D	E		E	C		F	B	
Approach Delay (s)		39.6			54.4			37.3			71.0	
Approach LOS		D			D			D			E	

Intersection Summary				
HCM 2000 Control Delay	49.7	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	85.8%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
17: SB SR-24 On-Ramp & MLK Way & NB SR-24 Off-Ramp

Children's Hospital
DC_2020 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	301	0	0	0	0	1682	0	0	0	0	1654	243
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	301	0	0	0	0	1682	0	0	0	0	1654	243
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	301	0	0	0	0	1682	0	0	0	0	1654	243
Confl. Peds. (#/hr)				3								
Confl. Bikes (#/hr)									12			
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	13.0					50.0					29.0	50.0
Effective Green, g (s)	13.0					50.0					29.0	50.0
Actuated g/C Ratio	0.26					1.00					0.58	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	850					1627					2072	2814
v/s Ratio Prot	0.09										0.46	0.09
v/s Ratio Perm						c1.03						
v/c Ratio	0.35					1.03					0.80	0.09
Uniform Delay, d1	15.1					25.0					8.2	0.0
Progression Factor	1.00					1.00					2.66	1.00
Incremental Delay, d2	1.2					31.5					2.6	0.0
Delay (s)	16.2					56.5					24.5	0.0
Level of Service	B					E					C	A
Approach Delay (s)		16.2			56.5			0.0			21.3	
Approach LOS		B			E			A			C	

Intersection Summary				
HCM 2000 Control Delay	36.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.23			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	61.0%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
18: West Street & 52nd Street

Children's Hospital
DC_2020 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	141	10	90	113	0	50	0	140	10	60	10
Peak Hour 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
Hourly flow rate (vph)	0	141	10	90	113	0	50	0	140	10	60	10

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	151	203	50	140	80
Volume Left (vph)	0	90	50	0	10
Volume Right (vph)	10	0	0	140	10
Hadj (s)	-0.02	0.12	0.50	-0.70	-0.02
Departure Headway (s)	4.8	4.9	6.0	4.8	5.1
Degree Utilization, x	0.20	0.28	0.08	0.19	0.11
Capacity (veh/h)	694	693	566	702	638
Control Delay (s)	9.0	9.7	8.3	7.7	8.8
Approach Delay (s)	9.0	9.7	7.8		8.8
Approach LOS	A	A	A		A

Intersection Summary					
Delay			8.9		
Level of Service			A		
Intersection Capacity Utilization			42.9%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis
19: Genoa Street & 52nd Street

Children's Hospital
DC_2020 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	131	10	10	113	50	10	10	10	20	10	10
Peak Hour 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
Hourly flow rate (vph)	10	131	10	10	113	50	10	10	10	20	10	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	151	173	30	40
Volume Left (vph)	10	10	10	20
Volume Right (vph)	10	50	10	10
Hadj (s)	-0.01	-0.16	-0.13	-0.05
Departure Headway (s)	4.2	4.1	4.5	4.6
Degree Utilization, x	0.18	0.20	0.04	0.05
Capacity (veh/h)	829	865	736	722
Control Delay (s)	8.1	8.0	7.7	7.8
Approach Delay (s)	8.1	8.0	7.7	7.8
Approach LOS	A	A	A	A

Intersection Summary					
Delay			8.0		
Level of Service			A		
Intersection Capacity Utilization			23.9%	ICU Level of Service	A
Analysis Period (min)			15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	380	10	20	381	40	10	20	40	40	10	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	20	380	10	20	381	40	10	20	40	40	10	20
Pedestrians		7						10			4	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		1						1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	425			400			908	900	395	920	885	412
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	425			400			908	900	395	920	885	412
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			96	93	94	81	96	97
cM capacity (veh/h)	1136			1160			231	268	653	214	271	634

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	410	441	70	70
Volume Left	20	20	10	40
Volume Right	10	40	40	20
cSH	1136	1160	391	274
Volume to Capacity	0.02	0.02	0.18	0.26
Queue Length 95th (ft)	1	1	16	25
Control Delay (s)	0.6	0.5	16.2	22.6
Lane LOS	A	A	C	C
Approach Delay (s)	0.6	0.5	16.2	22.6
Approach LOS			C	C

Intersection Summary				
Average Delay	3.2			
Intersection Capacity Utilization	47.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	123	2087	34	0	1796
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	123	2087	34	0	1796
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			154			137
pX, platoon unblocked	0.74	0.67			0.67	
vC, conflicting volume	2703	713			2121	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	658	0			928	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	83			100	
cM capacity (veh/h)	296	722			488	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	123	835	835	451	599	599	599
Volume Left	0	0	0	0	0	0	0
Volume Right	123	0	0	34	0	0	0
cSH	722	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.17	0.49	0.49	0.27	0.35	0.35	0.35
Queue Length 95th (ft)	15	0	0	0	0	0	0
Control Delay (s)	11.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	11.0	0.0			0.0		
Approach LOS	B						

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	55.4%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	1983	0	0	1867
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	1983	0	0	1867
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			424			204
pX, platoon unblocked	0.76					
vC, conflicting volume	2605	661			1983	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2022	661			1983	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	38	405			287	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	0	793	793	397	622	622	622
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.47	0.47	0.23	0.37	0.37	0.37
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	0.0	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	41.6%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	20	200	250	60	270	100	21	180	1441	72	160	1522
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			0.99			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.93			0.97			1.00	0.99		1.00	0.99
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1702			1741			1770	5027		1770	5037
Flt Permitted		0.98			0.79			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1663			1383			1770	5027		1770	5037
Peak-hour factor, PHF	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. Flow (vph)	20	200	250	60	270	100	21	180	1441	72	160	1522
RTOR Reduction (vph)	0	50	0	0	13	0	0	0	5	0	0	5
Lane Group Flow (vph)	0	420	0	0	417	0	0	201	1508	0	160	1587
Confl. Peds. (#/hr)	11		21	21		11				32		
Confl. Bikes (#/hr)			24			23				9		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		29.4			29.4			13.5	38.6		7.5	32.6
Effective Green, g (s)		29.4			29.4			13.5	38.6		7.5	32.6
Actuated g/C Ratio		0.33			0.33			0.15	0.43		0.08	0.36
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		543			451			265	2156		147	1824
v/s Ratio Prot								0.11	c0.30		0.09	c0.32
v/s Ratio Perm		0.25			c0.30							
v/c Ratio		0.77			0.92			0.76	0.70		1.09	0.87
Uniform Delay, d1		27.3			29.2			36.7	21.0		41.2	26.7
Progression Factor		1.00			1.00			0.56	0.33		1.00	1.00
Incremental Delay, d2		6.8			24.5			10.4	1.7		99.9	6.0
Delay (s)		34.1			53.8			31.0	8.6		141.1	32.7
Level of Service		C			D			C	A		F	C
Approach Delay (s)		34.1			53.8				11.3			42.6
Approach LOS		C			D				B			D

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	99.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: MLK Way & 55th Street

Children's Hospital
DC_2035 AM Plus Phase 1

Movement	SBR
Lane Configurations	
Volume (vph)	70
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	70
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	18
Confl. Bikes (#/hr)	11
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis
2: Dover Street & 55th Street

Children's Hospital
DC_2035 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	382	10	30	370	10	10	10	20	10	10	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	382	10	30	370	10	10	10	20	10	10	30
Pedestrians		14			30			23			9	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			3			2			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked	0.87						0.87	0.87		0.87	0.87	0.87
vC, conflicting volume	389			415			954	919	440	946	919	398
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	229			415			875	835	440	866	835	239
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			97			95	96	97	95	96	96
cM capacity (veh/h)	1147			1112			201	246	594	203	244	684

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	422	410	40	50
Volume Left	30	30	10	10
Volume Right	10	10	20	30
cSH	1147	1112	322	373
Volume to Capacity	0.03	0.03	0.12	0.13
Queue Length 95th (ft)	2	2	10	11
Control Delay (s)	0.8	0.9	17.7	16.2
Lane LOS	A	A	C	C
Approach Delay (s)	0.8	0.9	17.7	16.2
Approach LOS			C	C

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	45.8%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
DC_2035 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	272	80	40	290	70	50	520	30	30	620	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.98			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.97			0.98			0.99			0.99	
Flt Protected		0.99			1.00			1.00			1.00	
Satd. Flow (prot)		1717			1774			1837			1852	
Flt Permitted		0.78			0.92			0.91			0.96	
Satd. Flow (perm)		1348			1631			1675			1787	
Peak-hour factor, PHF	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. Flow (vph)	80	272	80	40	290	70	50	520	30	30	620	50
RTOR Reduction (vph)	0	10	0	0	10	0	0	2	0	0	3	0
Lane Group Flow (vph)	0	422	0	0	390	0	0	598	0	0	697	0
Confl. Peds. (#/hr)	9		20	20		9	11		26	26		11
Confl. Bikes (#/hr)			33			15			20			36
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		25.0			25.0			47.0			47.0	
Effective Green, g (s)		25.0			25.0			47.0			47.0	
Actuated g/C Ratio		0.31			0.31			0.59			0.59	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		421			509			984			1049	
v/s Ratio Prot												
v/s Ratio Perm		c0.31			0.24			0.36			c0.39	
v/c Ratio		1.00			0.77			0.61			0.66	
Uniform Delay, d1		27.5			24.9			10.6			11.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		44.3			10.6			2.8			3.3	
Delay (s)		71.8			35.4			13.4			14.5	
Level of Service		E			D			B			B	
Approach Delay (s)		71.8			35.4			13.4			14.5	
Approach LOS		E			D			B			B	

Intersection Summary				
HCM 2000 Control Delay	29.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	95.5%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
DC_2035 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	192	20	100	50	10	10	80	1122	60	40	1344	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	0.99		1.00	0.98	
Flpb, ped/bikes		1.00			0.99		1.00	1.00		0.99	1.00	
Frt		0.96			0.98		1.00	0.99		1.00	0.97	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1648			1711		1770	3493		1775	3424	
Flt Permitted		0.77			0.72		0.10	1.00		0.18	1.00	
Satd. Flow (perm)		1310			1280		181	3493		330	3424	
Peak-hour factor, PHF	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. Flow (vph)	192	20	100	50	10	10	80	1122	60	40	1344	300
RTOR Reduction (vph)	0	19	0	0	7	0	0	5	0	0	23	0
Lane Group Flow (vph)	0	293	0	0	63	0	80	1177	0	40	1621	0
Confl. Peds. (#/hr)	9		17	17		9	20		26	26		20
Confl. Bikes (#/hr)			23			23			65			41
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		19.9			19.9		41.1	41.1		41.1	41.1	
Effective Green, g (s)		19.9			19.9		41.1	41.1		41.1	41.1	
Actuated g/C Ratio		0.28			0.28		0.59	0.59		0.59	0.59	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		372			363		106	2050		193	2010	
v/s Ratio Prot								0.34			c0.47	
v/s Ratio Perm		c0.22			0.05		0.44			0.12		
v/c Ratio		0.79			0.17		0.75	0.57		0.21	0.81	
Uniform Delay, d1		23.1			18.9		10.7	9.0		6.8	11.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		10.5			0.2		38.7	1.2		2.4	3.6	
Delay (s)		33.6			19.1		49.4	10.2		9.2	14.9	
Level of Service		C			B		D	B		A	B	
Approach Delay (s)		33.6			19.1			12.7			14.8	
Approach LOS		C			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	82.7%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
5: MLK Way & 54th Street

Children's Hospital
DC_2035 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	10	10	60	10	10	10	11	30	1682	26	10	1793
Sign Control		Stop			Stop				Free			Free
Grade		0%			0%				0%			0%
Peak Hour 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
Hourly flow rate (vph)	10	10	60	10	10	10	0	30	1682	26	10	1793
Pedestrians		11			9				12			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		1			1				1			
Right turn flare (veh)												
Median type									None			None
Median storage veh)												
Upstream signal (ft)									299			294
pX, platoon unblocked	0.81	0.81	0.71	0.81	0.81	0.80	0.00	0.71			0.80	
vC, conflicting volume	2465	3606	626	2459	3598	583	0	1814			1717	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	356	1767	0	348	1757	0	0	724			1042	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			4.1	
tC, 2 stage (s)												
tF (s)	*5.0	*5.0	*5.0	*5.0	*5.0	*5.0	0.0	2.2			2.2	
p0 queue free %	96	83	88	96	83	98	0	95			98	
cM capacity (veh/h)	280	59	502	251	60	575	0	616			534	

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	80	30	450	841	446	458	896	458
Volume Left	10	10	30	0	0	10	0	0
Volume Right	60	10	0	0	26	0	0	10
cSH	247	134	616	1700	1700	534	1700	1700
Volume to Capacity	0.32	0.22	0.05	0.49	0.26	0.02	0.53	0.27
Queue Length 95th (ft)	34	20	4	0	0	1	0	0
Control Delay (s)	26.4	39.5	1.4	0.0	0.0	0.6	0.0	0.0
Lane LOS	D	E	A			A		
Approach Delay (s)	26.4	39.5	0.4			0.1		
Approach LOS	D	E						

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		

* User Entered Value

Movement	SBR
Lane Configurations	
Volume (veh/h)	10
Sign Control	
Grade	
Peak Hour Factor	1.00
Hourly flow rate (vph)	10
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	
tC, single (s)	
tC, 2 stage (s)	
tF (s)	
p0 queue free %	
cM capacity (veh/h)	

Direction, Lane #

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	16	10	10	10	10	10	20	20	10	40	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	16	10	10	10	10	10	20	20	10	40	10
Pedestrians		15			21			3			9	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	154	161	63	157	156	60	65			61		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	154	161	63	157	156	60	65			61		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	98	99	99	99	99	99			99		
cM capacity (veh/h)	759	704	992	751	708	986	1531			1528		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	36	30	50	60
Volume Left	10	10	10	10
Volume Right	10	10	20	10
cSH	783	798	1531	1528
Volume to Capacity	0.05	0.04	0.01	0.01
Queue Length 95th (ft)	4	3	0	0
Control Delay (s)	9.8	9.7	1.5	1.3
Lane LOS	A	A	A	A
Approach Delay (s)	9.8	9.7	1.5	1.3
Approach LOS	A	A		

Intersection Summary				
Average Delay	4.5			
Intersection Capacity Utilization	21.7%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
7: Shattuck Ave & 54th Street

Children's Hospital
DC_2035 AM Plus Phase 1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	26	20	590	710	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	26	20	590	710	10
Pedestrians	14			3	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.76	0.75	0.75			
vC, conflicting volume	1361	732	734			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1276	478	480			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	94	98			
cM capacity (veh/h)	135	438	803			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	36	610	720
Volume Left	10	20	0
Volume Right	26	0	10
cSH	270	803	1700
Volume to Capacity	0.13	0.02	0.42
Queue Length 95th (ft)	11	2	0
Control Delay (s)	20.3	0.7	0.0
Lane LOS	C	A	
Approach Delay (s)	20.3	0.7	0.0
Approach LOS	C		

Intersection Summary				
Average Delay		0.8		
Intersection Capacity Utilization		58.2%	ICU Level of Service	B
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
8: MLK Way & 53rd Street

Children's Hospital
DC_2035 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	1	59	60	10	18	30	1721	113	4	1875	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.98			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Frt		0.89			0.97		1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1603			1765		1770	5015		1787	5129	
Flt Permitted		0.96			0.80		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1548			1459		1770	5015		1787	5129	
Peak-hour factor, PHF	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. Flow (vph)	10	1	59	60	10	18	30	1721	113	4	1875	10
RTOR Reduction (vph)	0	48	0	0	13	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	22	0	0	75	0	30	1830	0	4	1885	0
Confl. Peds. (#/hr)	11		20	20		11			20			30
Confl. Bikes (#/hr)									8			20
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		16.8			16.8		4.5	58.9		1.8	56.2	
Effective Green, g (s)		16.8			16.8		4.5	58.9		1.8	56.2	
Actuated g/C Ratio		0.19			0.19		0.05	0.65		0.02	0.62	
Clearance Time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		288			272		88	3282		35	3202	
v/s Ratio Prot							0.02	c0.36		0.00	c0.37	
v/s Ratio Perm		0.01			c0.05							
v/c Ratio		0.08			0.28		0.34	0.56		0.11	0.59	
Uniform Delay, d1		30.2			31.4		41.3	8.5		43.3	10.0	
Progression Factor		1.00			0.99		1.16	0.60		0.47	0.26	
Incremental Delay, d2		0.1			0.6		1.7	0.5		0.8	0.5	
Delay (s)		30.3			31.7		49.8	5.6		21.3	3.1	
Level of Service		C			C		D	A		C	A	
Approach Delay (s)		30.3			31.7			6.3			3.1	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	5.8	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5	
Intersection Capacity Utilization	63.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
9: Dover Street & 53rd Street

Children's Hospital
DC_2035 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	50	30	0	0	20	10	0	0	0	10	0	50
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	50	30	0	0	20	10	0	0	0	10	0	50
Pedestrians		33			32			3			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			3			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	101	110	61	95	135	35	83			32		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	101	110	61	95	135	35	83			32		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	96	100	100	97	99	100			99		
cM capacity (veh/h)	794	737	980	802	714	1013	1485			1551		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	80	30	0	60
Volume Left	50	0	0	10
Volume Right	0	10	0	50
cSH	772	792	1700	1551
Volume to Capacity	0.10	0.04	0.00	0.01
Queue Length 95th (ft)	9	3	0	0
Control Delay (s)	10.2	9.7	0.0	1.3
Lane LOS	B	A		A
Approach Delay (s)	10.2	9.7	0.0	1.3
Approach LOS	B	A		

Intersection Summary				
Average Delay			7.0	
Intersection Capacity Utilization			28.8%	ICU Level of Service
Analysis Period (min)			15	

HCM Signalized Intersection Capacity Analysis
10: MLK Way & 52nd Street

Children's Hospital
DC_2035 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	68	82	120	84	103	332	60	110	1612	74	36	173
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.95			1.00	0.97		1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00			0.98	1.00		1.00	1.00			1.00
Frt	1.00	0.91			1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00			0.98	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1770	1630			1784	1533		1787	5096			1787
Flt Permitted	0.56	1.00			0.68	1.00		0.95	1.00			0.95
Satd. Flow (perm)	1050	1630			1248	1533		1787	5096			1787
Peak-hour factor, PHF	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. Flow (vph)	68	82	120	84	103	332	60	110	1612	74	36	173
RTOR Reduction (vph)	0	61	0	0	0	174	0	0	5	0	0	0
Lane Group Flow (vph)	68	141	0	0	187	158	0	170	1681	0	0	209
Confl. Peds. (#/hr)	15		74	74		15				11		
Confl. Bikes (#/hr)			9			8				2		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	23.1	23.1			23.1	23.1		7.5	40.9			12.5
Effective Green, g (s)	23.1	23.1			23.1	23.1		7.5	40.9			12.5
Actuated g/C Ratio	0.26	0.26			0.26	0.26		0.08	0.45			0.14
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	269	418			320	393		148	2315			248
v/s Ratio Prot		0.09						c0.10	c0.33			c0.12
v/s Ratio Perm	0.06				c0.15	0.10						
v/c Ratio	0.25	0.34			0.58	0.40		1.15	0.73			0.84
Uniform Delay, d1	26.6	27.2			29.3	27.7		41.2	20.0			37.8
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.09			0.85
Incremental Delay, d2	0.2	0.2			1.8	0.2		93.1	0.8			18.8
Delay (s)	26.8	27.4			31.0	28.0		134.4	22.5			50.7
Level of Service	C	C			C	C		F	C			D
Approach Delay (s)		27.2			29.1				32.8			
Approach LOS		C			C				C			

Intersection Summary				
HCM 2000 Control Delay		26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio		0.73		
Actuated Cycle Length (s)		90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization		108.3%	ICU Level of Service	G
Analysis Period (min)		15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1768	7
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5131	
Flt Permitted	1.00	
Satd. Flow (perm)	5131	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1768	7
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1775	0
Confl. Peds. (#/hr)		15
Confl. Bikes (#/hr)		15
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	45.4	
Effective Green, g (s)	45.4	
Actuated g/C Ratio	0.50	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2588	
v/s Ratio Prot	0.35	
v/s Ratio Perm		
v/c Ratio	0.69	
Uniform Delay, d1	16.9	
Progression Factor	0.89	
Incremental Delay, d2	1.3	
Delay (s)	16.3	
Level of Service	B	
Approach Delay (s)	19.9	
Approach LOS	B	

Intersection Summary			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	296	9	5	477	2	15	7	10	0	2	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		0.99			1.00			0.94			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.96			0.88	
Flt Protected		1.00			1.00			0.98			1.00	
Satd. Flow (prot)		3503			3601			1434			1655	
Flt Permitted		0.95			0.95			0.94			1.00	
Satd. Flow (perm)		3344			3430			1374			1655	
Peak-hour factor, PHF	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. Flow (vph)	4	296	9	5	477	2	15	7	10	0	2	15
RTOR Reduction (vph)	0	4	0	0	1	0	0	5	0	0	8	0
Lane Group Flow (vph)	0	305	0	0	483	0	0	27	0	0	9	0
Confl. Peds. (#/hr)	26		83	83		26			303	303		
Confl. Bikes (#/hr)			9			8						2
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Prot	NA		Perm	NA		Perm	NA			NA	
Protected Phases	5	2			6			4			8	
Permitted Phases				6			4			8		
Actuated Green, G (s)		21.0			14.0			23.0			23.0	
Effective Green, g (s)		21.0			14.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.28			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1417			960			632			761	
v/s Ratio Prot		c0.02									0.01	
v/s Ratio Perm		0.07			c0.14			c0.02				
v/c Ratio		0.22			0.50			0.04			0.01	
Uniform Delay, d1		9.2			15.1			7.4			7.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.3			1.9			0.1			0.0	
Delay (s)		9.6			17.0			7.6			7.4	
Level of Service		A			B			A			A	
Approach Delay (s)		9.6			17.0			7.6			7.4	
Approach LOS		A			B			A			A	

Intersection Summary					
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.22				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	9.0		
Intersection Capacity Utilization	42.6%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
12: 52nd Street & Dover Street

Children's Hospital
DC_2035 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	12	302	3	11	480	5	3	0	7	2	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	12	302	3	11	480	5	3	0	7	2	0	6
Pedestrians		30			15			18			35	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			1			1			3	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.82			0.91			0.87	0.87	0.91	0.87	0.87	0.82
vC, conflicting volume	520			323			886	888	336	889	886	548
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	306			207			557	559	222	561	558	340
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	99			99			99	100	99	99	100	99
cM capacity (veh/h)	995			1229			335	346	707	345	357	550

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	317	496	10	8
Volume Left	12	11	3	2
Volume Right	3	5	7	6
cSH	995	1229	531	479
Volume to Capacity	0.01	0.01	0.02	0.02
Queue Length 95th (ft)	1	1	1	1
Control Delay (s)	0.5	0.3	11.9	12.6
Lane LOS	A	A	B	B
Approach Delay (s)	0.5	0.3	11.9	12.6
Approach LOS			B	B

Intersection Summary					
Average Delay	0.6				
Intersection Capacity Utilization	46.1%	ICU Level of Service		A	
Analysis Period (min)	15				

HCM Unsignalized Intersection Capacity Analysis
13: SR-24 NB Off-Ramp & 52nd Street

Children's Hospital
DC_2035 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	317	0	0	505	1271	0	1100	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	317	0	0	505	1271	0	1100	0	0
Pedestrians							36			
Lane Width (ft)							12.0			
Walking Speed (ft/s)							4.0			
Percent Blockage							3			
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.78						0.78		0.78	0.78
vC, conflicting volume	1776			353			2129	194	1764	858
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1423			353			1877	194	1406	239
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	368			1166			53	787	0	497

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	158	158	337	592	847	550	550
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	424	847	550	550
cSH	1700	1700	1700	1700	1700	787	787
Volume to Capacity	0.09	0.09	0.20	0.35	0.50	0.70	0.70
Queue Length 95th (ft)	0	0	0	0	0	146	146
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	19.5	19.5
Lane LOS						C	C
Approach Delay (s)	0.0		0.0			19.5	
Approach LOS						C	

Intersection Summary					
Average Delay	6.7				
Intersection Capacity Utilization	57.1%	ICU Level of Service		B	
Analysis Period (min)	15				

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	50	300	907	160	50	1135	150	180	150	60	145	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.99		1.00	0.99		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.98		1.00	0.98		1.00	0.96			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.98
Satd. Flow (prot)		1787	4958		1805	5070		1752	1748			1730
Flt Permitted		0.95	1.00		0.95	1.00		0.31	1.00			0.76
Satd. Flow (perm)		1787	4958		1805	5070		577	1748			1349
Peak-hour factor, PHF	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. Flow (vph)	50	300	907	160	50	1135	150	180	150	60	145	190
RTOR Reduction (vph)	0	0	26	0	0	18	0	0	17	0	0	0
Lane Group Flow (vph)	0	350	1041	0	50	1267	0	180	193	0	0	335
Confl. Peds. (#/hr)				18			8			15	15	
Confl. Bikes (#/hr)				18			2			15		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		20.0	37.5		3.6	21.1		34.9	34.9			25.9
Effective Green, g (s)		20.0	37.5		3.6	21.1		34.9	34.9			25.9
Actuated g/C Ratio		0.22	0.42		0.04	0.23		0.39	0.39			0.29
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		397	2065		72	1188		289	677			388
v/s Ratio Prot		c0.20	0.21		0.03	c0.25		c0.03	0.11			
v/s Ratio Perm								0.21				c0.25
v/c Ratio		0.88	0.50		0.69	1.07		0.62	0.29			0.86
Uniform Delay, d1		33.9	19.4		42.7	34.5		22.1	19.0			30.4
Progression Factor		1.00	1.00		1.02	0.87		1.00	1.00			1.00
Incremental Delay, d2		23.4	0.9		17.1	41.2		4.1	1.1			21.7
Delay (s)		57.3	20.3		60.5	71.3		26.2	20.0			52.1
Level of Service		E	C		E	E		C	C			D
Approach Delay (s)			29.4			70.9			22.9			39.1
Approach LOS			C			E			C			D

Intersection Summary			
HCM 2000 Control Delay	44.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	111.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: 52nd Street & Shattuck Ave

Children's Hospital
DC_2035 AM Plus Phase 1

Movement	SBR
Lane Configurations	
Volume (vph)	411
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.92
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1386
Flt Permitted	1.00
Satd. Flow (perm)	1386
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	411
RTOR Reduction (vph)	256
Lane Group Flow (vph)	155
Confl. Peds. (#/hr)	24
Confl. Bikes (#/hr)	62
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	25.9
Effective Green, g (s)	25.9
Actuated g/C Ratio	0.29
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	398
v/s Ratio Prot	
v/s Ratio Perm	0.11
v/c Ratio	0.39
Uniform Delay, d1	25.7
Progression Factor	1.00
Incremental Delay, d2	2.8
Delay (s)	28.5
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Fehr & Peers

Synchro 8 Report

HCM Signalized Intersection Capacity Analysis
15: Telegraph Ave & 52nd Street/Claremont Ave

Children's Hospital
DC_2035 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	10	120	70	230	10	1002	140	130	900	484
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.98			0.99		1.00	0.96	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.95		1.00	0.89			0.98		1.00	0.95	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1641		1698	1560			3862		1770	3208	
Flt Permitted		0.98		0.95	1.00			0.94		0.95	1.00	
Satd. Flow (perm)		1641		1698	1560			3626		1770	3208	
Peak-hour factor, PHF	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. Flow (vph)	10	10	10	120	70	230	10	1002	140	130	900	484
RTOR Reduction (vph)	0	10	0	0	129	0	0	9	0	0	57	0
Lane Group Flow (vph)	0	21	0	108	183	0	0	1143	0	130	1327	0
Confl. Peds. (#/hr)	6					6	33		27			33
Confl. Bikes (#/hr)			2			3			50			41
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		4.5		17.1	17.1			40.6		9.8	54.9	
Effective Green, g (s)		4.5		17.1	17.1			40.6		9.8	54.9	
Actuated g/C Ratio		0.05		0.19	0.19			0.45		0.11	0.61	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		82		322	296			1635		192	1956	
v/s Ratio Prot		c0.01		0.06	c0.12					0.07	c0.41	
v/s Ratio Perm								0.32				
v/c Ratio		0.25		0.34	0.62			0.70		0.68	0.68	
Uniform Delay, d1		41.1		31.5	33.5			19.8		38.6	11.7	
Progression Factor		1.50		1.00	1.00			0.93		1.00	1.00	
Incremental Delay, d2		0.8		0.6	3.8			1.7		9.1	1.9	
Delay (s)		62.5		32.2	37.3			20.2		47.7	13.6	
Level of Service		E		C	D			C		D	B	
Approach Delay (s)		62.5			36.0			20.2			16.5	
Approach LOS		E			D			C			B	

Intersection Summary				
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	101.3%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
16: Telegraph Ave & 51St Street

Children's Hospital
DC_2035 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	322	660	100	130	590	320	131	510	80	220	740	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.97		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3399		1787	3292		1719	3324		1752	3420	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3399		1787	3292		1719	3324		1752	3420	
Peak-hour factor, PHF	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. Flow (vph)	322	660	100	130	590	320	131	510	80	220	740	70
RTOR Reduction (vph)	0	13	0	0	80	0	0	13	0	0	8	0
Lane Group Flow (vph)	322	747	0	130	830	0	131	577	0	220	802	0
Confl. Peds. (#/hr)			47			47			45			56
Confl. Bikes (#/hr)			14			11			41			41
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	12.8	27.2		10.6	25.5		10.7	23.7		12.0	26.0	
Effective Green, g (s)	12.8	27.2		10.6	25.5		10.7	23.7		12.0	26.0	
Actuated g/C Ratio	0.14	0.30		0.12	0.28		0.12	0.26		0.13	0.29	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	483	1027		210	932		204	875		233	988	
v/s Ratio Prot	c0.09	0.22		0.07	c0.25		0.08	0.17		c0.13	c0.23	
v/s Ratio Perm												
v/c Ratio	0.67	0.73		0.62	0.89		0.64	0.66		0.94	0.81	
Uniform Delay, d1	36.6	28.1		37.8	30.9		37.8	29.5		38.7	29.7	
Progression Factor	1.25	0.82		1.00	1.00		1.00	1.00		1.24	0.83	
Incremental Delay, d2	3.0	3.9		5.3	12.5		6.7	3.9		37.5	5.8	
Delay (s)	48.8	26.8		43.1	43.4		44.6	33.4		85.5	30.6	
Level of Service	D	C		D	D		D	C		F	C	
Approach Delay (s)		33.3			43.4			35.5			42.3	
Approach LOS		C			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	38.8	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	81.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
17: SB SR-24 On-Ramp & MLK Way & NB SR-24 Off-Ramp

Children's Hospital
DC_2035 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	261	0	0	0	0	1615	0	0	0	0	1721	261
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	261	0	0	0	0	1615	0	0	0	0	1721	261
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	261	0	0	0	0	1615	0	0	0	0	1721	261
Confl. Peds. (#/hr)				9								
Confl. Bikes (#/hr)									3			
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	8.0					45.0					29.0	45.0
Effective Green, g (s)	8.0					45.0					29.0	45.0
Actuated g/C Ratio	0.18					1.00					0.64	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	581					1627					2303	2814
v/s Ratio Prot	0.08										0.48	0.09
v/s Ratio Perm						c0.99						
v/c Ratio	0.45					0.99					0.75	0.09
Uniform Delay, d1	16.5					0.0					5.5	0.0
Progression Factor	1.00					1.00					2.07	1.00
Incremental Delay, d2	2.5					20.6					1.7	0.0
Delay (s)	19.0					20.6					13.1	0.0
Level of Service	B					C					B	A
Approach Delay (s)		19.0			20.6			0.0			11.3	
Approach LOS		B			C			A			B	

Intersection Summary				
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	1.21			
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	61.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
18: West Street & 52nd Street

Children's Hospital
DC_2035 AM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	190	20	80	130	0	40	0	80	10	60	10
Peak Hour 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
Hourly flow rate (vph)	0	190	20	80	130	0	40	0	80	10	60	10

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	210	210	40	80	80
Volume Left (vph)	0	80	40	0	10
Volume Right (vph)	20	0	0	80	10
Hadj (s)	-0.04	0.11	0.50	-0.70	-0.02
Departure Headway (s)	4.6	4.8	6.1	4.9	5.2
Degree Utilization, x	0.27	0.28	0.07	0.11	0.12
Capacity (veh/h)	730	712	545	669	628
Control Delay (s)	9.4	9.6	8.4	7.3	8.9
Approach Delay (s)	9.4	9.6	7.7		8.9
Approach LOS	A	A	A		A

Intersection Summary				
Delay	9.1			
Level of Service	A			
Intersection Capacity Utilization	44.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	20	170	10	10	140	30	10	10	10	30	10	10
Peak Hour 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
Hourly flow rate (vph)	20	170	10	10	140	30	10	10	10	30	10	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	200	180	30	50
Volume Left (vph)	20	10	10	30
Volume Right (vph)	10	30	10	10
Hadj (s)	0.01	-0.09	-0.13	0.00
Departure Headway (s)	4.3	4.2	4.7	4.8
Degree Utilization, x	0.24	0.21	0.04	0.07
Capacity (veh/h)	816	820	704	688
Control Delay (s)	8.6	8.3	7.9	8.1
Approach Delay (s)	8.6	8.3	7.9	8.1
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.4	
Level of Service			A	
Intersection Capacity Utilization			28.6%	ICU Level of Service
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	400	10	10	440	20	10	20	20	40	20	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	400	10	10	440	20	10	20	20	40	20	10
Pedestrians		12			3			15			17	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	477			425			942	937	423	945	932	479
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	477			425			942	937	423	945	932	479
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			95	92	97	81	92	98
cM capacity (veh/h)	1075			1131			214	255	626	209	255	573

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	420	470	50	70
Volume Left	10	10	10	40
Volume Right	10	20	20	10
cSH	1075	1131	318	244
Volume to Capacity	0.01	0.01	0.16	0.29
Queue Length 95th (ft)	1	1	14	29
Control Delay (s)	0.3	0.3	18.4	25.6
Lane LOS	A	A	C	D
Approach Delay (s)	0.3	0.3	18.4	25.6
Approach LOS			C	D

Intersection Summary				
Average Delay			2.9	
Intersection Capacity Utilization			46.5%	ICU Level of Service
Analysis Period (min)			15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	34	1837	201	0	1994
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	34	1837	201	0	1994
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			154			137
pX, platoon unblocked	0.84	0.73			0.73	
vC, conflicting volume	2602	713			2038	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	478	0			1136	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	435	794			447	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	34	735	735	568	665	665	665
Volume Left	0	0	0	0	0	0	0
Volume Right	34	0	0	201	0	0	0
cSH	794	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.04	0.43	0.43	0.33	0.39	0.39	0.39
Queue Length 95th (ft)	3	0	0	0	0	0	0
Control Delay (s)	9.7	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	9.7	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	50.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	1	1851	25	0	2032
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	1	1851	25	0	2032
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			424			204
pX, platoon unblocked	0.74					
vC, conflicting volume	2541	630			1876	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1837	630			1876	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	49	425			316	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	1	740	740	395	677	677	677
Volume Left	0	0	0	0	0	0	0
Volume Right	1	0	0	25	0	0	0
cSH	425	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.44	0.44	0.23	0.40	0.40	0.40
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	13.5	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	13.5	0.0			0.0		
Approach LOS	B						

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	46.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	20	270	180	60	240	110	29	211	1772	166	200	1471
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			0.99			1.00	0.99		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.95			0.96			1.00	0.99		1.00	1.00
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1747			1728			1770	4975		1770	5054
Flt Permitted		0.97			0.75			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1707			1310			1770	4975		1770	5054
Peak-hour factor, PHF	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. Flow (vph)	20	270	180	60	240	110	29	211	1772	166	200	1471
RTOR Reduction (vph)	0	23	0	0	14	0	0	0	10	0	0	3
Lane Group Flow (vph)	0	447	0	0	396	0	0	240	1928	0	200	1508
Confl. Peds. (#/hr)	17		23	23		17				30		
Confl. Bikes (#/hr)			24			18				23		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		31.7			31.7			21.5	42.3		11.5	32.3
Effective Green, g (s)		31.7			31.7			21.5	42.3		11.5	32.3
Actuated g/C Ratio		0.32			0.32			0.22	0.42		0.12	0.32
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		541			415			380	2104		203	1632
v/s Ratio Prot								0.14	c0.39		0.11	c0.30
v/s Ratio Perm		0.26			c0.30							
v/c Ratio		0.83			0.96			0.63	0.92		0.99	0.92
Uniform Delay, d1		31.6			33.5			35.7	27.2		44.2	32.7
Progression Factor		1.00			1.00			0.57	0.44		1.00	1.00
Incremental Delay, d2		10.0			32.5			2.7	6.4		58.5	10.3
Delay (s)		41.6			66.0			23.1	18.3		102.6	43.0
Level of Service		D			E			C	B		F	D
Approach Delay (s)		41.6			66.0				18.8			50.0
Approach LOS		D			E				B			D

Intersection Summary			
HCM 2000 Control Delay	36.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	106.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	40
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	40
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	18
Confl. Bikes (#/hr)	23
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	586	20	10	330	20	20	20	30	20	20	40
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	586	20	10	330	20	20	20	30	20	20	40
Pedestrians		6			20			11			26	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked	0.96						0.96	0.96		0.96	0.96	0.96
vC, conflicting volume	376			617			1083	1063	627	1102	1063	372
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	328			617			1065	1044	627	1085	1044	324
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			99			87	90	94	86	90	94
cM capacity (veh/h)	1140			945			158	207	475	147	204	667

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	636	360	70	80
Volume Left	30	10	20	20
Volume Right	20	20	30	40
cSH	1140	945	244	272
Volume to Capacity	0.03	0.01	0.29	0.29
Queue Length 95th (ft)	2	1	29	30
Control Delay (s)	0.7	0.4	25.6	23.6
Lane LOS	A	A	D	C
Approach Delay (s)	0.7	0.4	25.6	23.6
Approach LOS			D	C

Intersection Summary				
Average Delay	3.7			
Intersection Capacity Utilization	62.2%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
DC_2035 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	446	70	30	210	50	80	630	50	30	580	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.99			0.99			1.00			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.99			0.99	
Flt Protected		0.99			0.99			0.99			1.00	
Satd. Flow (prot)		1750			1773			1827			1843	
Flt Permitted		0.86			0.91			0.88			0.95	
Satd. Flow (perm)		1519			1618			1613			1757	
Peak-hour factor, PHF	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. Flow (vph)	110	446	70	30	210	50	80	630	50	30	580	60
RTOR Reduction (vph)	0	6	0	0	10	0	0	3	0	0	5	0
Lane Group Flow (vph)	0	620	0	0	280	0	0	757	0	0	665	0
Confl. Peds. (#/hr)	17		17	17		17	29		11	11		29
Confl. Bikes (#/hr)			23			15			47			33
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		29.0			29.0			43.0			43.0	
Effective Green, g (s)		29.0			29.0			43.0			43.0	
Actuated g/C Ratio		0.36			0.36			0.54			0.54	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		550			586			866			944	
v/s Ratio Prot												
v/s Ratio Perm		c0.41			0.17			c0.47			0.38	
v/c Ratio		1.13			0.48			0.87			0.70	
Uniform Delay, d1		25.5			19.7			16.1			13.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		78.6			2.8			11.9			4.4	
Delay (s)		104.1			22.5			28.0			18.2	
Level of Service		F			C			C			B	
Approach Delay (s)		104.1			22.5			28.0			18.2	
Approach LOS		F			C			C			B	

Intersection Summary				
HCM 2000 Control Delay	44.8	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.98			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	128.7%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
DC_2035 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	315	30	171	50	20	20	130	1197	70	20	1131	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.98			0.99		1.00	0.99		1.00	0.98	
Flpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Frt		0.96			0.97		1.00	0.99		1.00	0.99	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1625			1695		1770	3488		1787	3469	
Flt Permitted		0.78			0.72		0.12	1.00		0.12	1.00	
Satd. Flow (perm)		1301			1247		224	3488		218	3469	
Peak-hour factor, PHF	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. Flow (vph)	315	30	171	50	20	20	130	1197	70	20	1131	120
RTOR Reduction (vph)	0	20	0	0	12	0	0	4	0	0	9	0
Lane Group Flow (vph)	0	496	0	0	78	0	130	1263	0	20	1242	0
Confl. Peds. (#/hr)	17		39	39		17	38		26	26		38
Confl. Bikes (#/hr)			12			14			44			68
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		35.3			35.3		45.7	45.7		45.7	45.7	
Effective Green, g (s)		35.3			35.3		45.7	45.7		45.7	45.7	
Actuated g/C Ratio		0.39			0.39		0.51	0.51		0.51	0.51	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		510			489		113	1771		110	1761	
v/s Ratio Prot								0.36			0.36	
v/s Ratio Perm		c0.38			0.06		c0.58			0.09		
v/c Ratio		0.97			0.16		1.15	0.71		0.18	0.71	
Uniform Delay, d1		26.9			17.7		22.1	17.1		12.0	17.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		32.6			0.2		130.8	2.5		3.6	2.4	
Delay (s)		59.5			17.9		152.9	19.6		15.6	19.4	
Level of Service		E			B		F	B		B	B	
Approach Delay (s)		59.5			17.9			32.0			19.3	
Approach LOS		E			B			C			B	

Intersection Summary				
HCM 2000 Control Delay	31.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	1.07			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	91.1%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (veh/h)	10	10	50	20	10	10	13	40	2120	48	10	20
Sign Control		Stop			Stop				Free			
Grade		0%			0%				0%			
Peak Hour 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
Hourly flow rate (vph)	10	10	50	20	10	10	0	40	2120	48	0	20
Pedestrians		8			29				17			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		1			2				1			
Right turn flare (veh)												
Median type									None			
Median storage veh)												
Upstream signal (ft)									299			
pX, platoon unblocked	0.85	0.85	0.71	0.85	0.85	0.72	0.00	0.71			0.00	0.72
vC, conflicting volume	2530	4005	592	2922	3991	760	0	1698			0	2197
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2	1731	0	462	1715	0	0	581			0	1316
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			0.0	4.1
tC, 2 stage (s)												
tF (s)	*7.0	*7.0	*7.0	*7.0	*7.0	*7.0	0.0	2.2			0.0	2.2
p0 queue free %	97	83	86	88	83	97	0	94			0	95
cM capacity (veh/h)	331	58	360	164	59	363	0	703			0	372

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	70	40	570	1060	578	438	835	438
Volume Left	10	20	40	0	0	20	0	0
Volume Right	50	10	0	0	48	0	0	20
cSH	205	126	703	1700	1700	372	1700	1700
Volume to Capacity	0.34	0.32	0.06	0.62	0.34	0.05	0.49	0.26
Queue Length 95th (ft)	36	31	5	0	0	4	0	0
Control Delay (s)	31.4	46.4	1.5	0.0	0.0	1.7	0.0	0.0
Lane LOS	D	E	A			A		
Approach Delay (s)	31.4	46.4	0.4			0.4		
Approach LOS	D	E						

Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	95.3%	ICU Level of Service	F	
Analysis Period (min)	15			

* User Entered Value

Movement	SBT	SBR
Lane Configurations		
Volume (veh/h)	1670	20
Sign Control	Free	
Grade	0%	
Peak Hour Factor	1.00	1.00
Hourly flow rate (vph)	1670	20
Pedestrians		
Lane Width (ft)		
Walking Speed (ft/s)		
Percent Blockage		
Right turn flare (veh)		
Median type	None	
Median storage veh)		
Upstream signal (ft)	294	
pX, platoon unblocked		
vC, conflicting volume		
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol		
tC, single (s)		
tC, 2 stage (s)		
tF (s)		
p0 queue free %		
cM capacity (veh/h)		

Direction, Lane #

HCM Unsignalized Intersection Capacity Analysis
6: Dover Street & 54th Street

Children's Hospital
DC_2035 PM Plus Phase 1

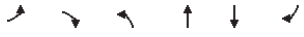
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	48	10	10	10	20	10	50	10	10	30	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	48	10	10	10	20	10	50	10	10	30	10
Pedestrians		18			12			9			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	178	165	62	185	165	72	58			72		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	178	165	62	185	165	72	58			72		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	93	99	99	99	98	99			99		
cM capacity (veh/h)	728	704	986	699	704	982	1536			1526		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	68	40	70	50
Volume Left	10	10	10	10
Volume Right	10	20	10	10
cSH	738	818	1536	1526
Volume to Capacity	0.09	0.05	0.01	0.01
Queue Length 95th (ft)	8	4	0	0
Control Delay (s)	10.4	9.6	1.1	1.5
Lane LOS	B	A	A	A
Approach Delay (s)	10.4	9.6	1.1	1.5
Approach LOS	B	A		

Intersection Summary				
Average Delay	5.4			
Intersection Capacity Utilization	21.9%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
7: Shattuck Ave & 54th Street

Children's Hospital
DC_2035 PM Plus Phase 1



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	48	20	770	700	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	48	20	770	700	10
Pedestrians	38				2	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	3				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.80	0.74	0.74			
vC, conflicting volume	1555	743	748			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1242	476	482			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	89	97			
cM capacity (veh/h)	146	425	773			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	58	790	710
Volume Left	10	20	0
Volume Right	48	0	10
cSH	320	773	1700
Volume to Capacity	0.18	0.03	0.42
Queue Length 95th (ft)	16	2	0
Control Delay (s)	18.7	0.7	0.0
Lane LOS	C	A	
Approach Delay (s)	18.7	0.7	0.0
Approach LOS	C		

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	66.8%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	10	6	67	80	10	8	10	10	2203	105	7	1756
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			1.00			1.00	0.99		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.89			0.99			1.00	0.99		1.00	1.00
Flt Protected		0.99			0.96			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1616			1796			1770	5012		1787	5129
Flt Permitted		0.96			0.72			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1568			1355			1770	5012		1787	5129
Peak-hour factor, PHF	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. Flow (vph)	10	6	67	80	10	8	10	10	2203	105	7	1756
RTOR Reduction (vph)	0	55	0	0	4	0	0	0	3	0	0	0
Lane Group Flow (vph)	0	28	0	0	94	0	0	20	2305	0	7	1766
Confl. Peds. (#/hr)	12		6	6		12				48		
Confl. Bikes (#/hr)			6			3				20		
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		17.6			17.6			3.1	68.1		1.8	66.8
Effective Green, g (s)		17.6			17.6			3.1	68.1		1.8	66.8
Actuated g/C Ratio		0.18			0.18			0.03	0.68		0.02	0.67
Clearance Time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		275			238			54	3413		32	3426
v/s Ratio Prot								0.01	c0.46		0.00	c0.34
v/s Ratio Perm		0.02			c0.07							
v/c Ratio		0.10			0.39			0.37	0.68		0.22	0.52
Uniform Delay, d1		34.6			36.5			47.5	9.4		48.4	8.4
Progression Factor		1.00			1.01			1.42	0.26		0.75	0.49
Incremental Delay, d2		0.2			1.1			2.7	0.7		1.7	0.3
Delay (s)		34.7			38.0			70.3	3.2		38.1	4.4
Level of Service		C			D			E	A		D	A
Approach Delay (s)		34.7			38.0				3.8			4.6
Approach LOS		C			D				A			A

Intersection Summary			
HCM 2000 Control Delay	5.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: MLK Way & 53rd Street

Children's Hospital
DC_2035 PM Plus Phase 1

Movement	SBR
Lane Configurations	
Volume (vph)	10
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	10
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	21
Confl. Bikes (#/hr)	24
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis
9: Dover Street & 53rd Street

Children's Hospital
DC_2035 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	70	20	0	0	20	10	0	0	0	10	0	40
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	70	20	0	0	20	10	0	0	0	10	0	40
Pedestrians		38			15			6			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	104	93	64	71	113	21	78			15		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	104	93	64	71	113	21	78			15		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	91	97	100	100	97	99	100			99		
cM capacity (veh/h)	792	761	969	857	742	1044	1485			1596		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	90	30	0	50
Volume Left	70	0	0	10
Volume Right	0	10	0	40
cSH	785	821	1700	1596
Volume to Capacity	0.11	0.04	0.00	0.01
Queue Length 95th (ft)	10	3	0	0
Control Delay (s)	10.2	9.6	0.0	1.5
Lane LOS	B	A		A
Approach Delay (s)	10.2	9.6	0.0	1.5
Approach LOS	B	A		

Intersection Summary				
Average Delay	7.5			
Intersection Capacity Utilization	29.8%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
10: MLK Way & 52nd Street

Children's Hospital
DC_2035 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	98	122	110	122	95	271	60	120	1867	75	4	217
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.95			1.00	0.96		1.00	1.00			1.00
Flpb, ped/bikes	0.98	1.00			0.97	1.00		1.00	1.00			1.00
Frt	1.00	0.93			1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00			0.97	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1759	1657			1752	1520		1787	5097			1787
Flt Permitted	0.50	1.00			0.54	1.00		0.95	1.00			0.95
Satd. Flow (perm)	920	1657			970	1520		1787	5097			1787
Peak-hour factor, PHF	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. Flow (vph)	98	122	110	122	95	271	60	120	1867	75	4	217
RTOR Reduction (vph)	0	35	0	0	0	201	0	0	4	0	0	0
Lane Group Flow (vph)	98	197	0	0	217	70	0	180	1938	0	0	221
Confl. Peds. (#/hr)	24		92	92		24				15		
Confl. Bikes (#/hr)			14			6				23		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	25.7	25.7			25.7	25.7		13.6	43.3			17.5
Effective Green, g (s)	25.7	25.7			25.7	25.7		13.6	43.3			17.5
Actuated g/C Ratio	0.26	0.26			0.26	0.26		0.14	0.43			0.18
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	236	425			249	390		243	2207			312
v/s Ratio Prot		0.12						0.10	c0.38			0.12
v/s Ratio Perm	0.11				c0.22	0.05						
v/c Ratio	0.42	0.46			0.87	0.18		0.74	0.88			0.71
Uniform Delay, d1	30.9	31.3			35.6	28.9		41.5	25.9			38.8
Progression Factor	1.00	1.00			0.96	2.56		0.97	1.06			0.57
Incremental Delay, d2	0.4	0.3			25.0	0.1		3.0	1.6			5.3
Delay (s)	31.3	31.6			59.0	74.2		43.1	29.1			27.6
Level of Service	C	C			E	E		D	C			C
Approach Delay (s)		31.5			67.5				30.3			
Approach LOS		C			E				C			

Intersection Summary				
HCM 2000 Control Delay	26.2	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		14.0
Intersection Capacity Utilization	113.6%	ICU Level of Service		H
Analysis Period (min)	15			

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1678	4
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5133	
Flt Permitted	1.00	
Satd. Flow (perm)	5133	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1678	4
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1682	0
Confl. Peds. (#/hr)		20
Confl. Bikes (#/hr)		26
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	46.7	
Effective Green, g (s)	46.7	
Actuated g/C Ratio	0.47	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2397	
v/s Ratio Prot	c0.33	
v/s Ratio Perm		
v/c Ratio	0.70	
Uniform Delay, d1	21.1	
Progression Factor	0.30	
Incremental Delay, d2	1.6	
Delay (s)	7.9	
Level of Service	A	
Approach Delay (s)	10.2	
Approach LOS	B	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	395	8	8	392	2	25	3	13	0	4	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.93			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.96			0.87	
Flt Protected		1.00			1.00			0.97			1.00	
Satd. Flow (prot)		3514			3595			1419			1640	
Flt Permitted		0.95			0.95			0.89			1.00	
Satd. Flow (perm)		3356			3409			1304			1640	
Peak-hour factor, PHF	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. Flow (vph)	3	395	8	8	392	2	25	3	13	0	4	59
RTOR Reduction (vph)	0	3	0	0	1	0	0	7	0	0	32	0
Lane Group Flow (vph)	0	403	0	0	401	0	0	34	0	0	31	0
Confl. Peds. (#/hr)			89	89		38			312	312		
Confl. Bikes (#/hr)			15			9						2
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Prot	NA		Perm	NA		Perm	NA			NA	
Protected Phases	5	2			6			4			8	
Permitted Phases				6			4			8		
Actuated Green, G (s)		21.0			14.0			23.0			23.0	
Effective Green, g (s)		21.0			14.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.28			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1422			954			599			754	
v/s Ratio Prot		c0.02									0.02	
v/s Ratio Perm		0.10			c0.12			c0.03				
v/c Ratio		0.28			0.42			0.06			0.04	
Uniform Delay, d1		9.5			14.7			7.5			7.4	
Progression Factor		1.95			1.00			1.00			1.00	
Incremental Delay, d2		0.4			1.4			0.2			0.1	
Delay (s)		19.0			16.1			7.7			7.5	
Level of Service		B			B			A			A	
Approach Delay (s)		19.0			16.1			7.7			7.5	
Approach LOS		B			B			A			A	

Intersection Summary					
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.21				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	9.0		
Intersection Capacity Utilization	42.5%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
12: 52nd Street & Dover Street

Children's Hospital
DC_2035 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	401	8	5	398	4	7	0	8	10	0	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	8	401	8	5	398	4	7	0	8	10	0	14
Pedestrians		56			11			53			23	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		5			1			4			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.86			0.88			0.93	0.93	0.88	0.93	0.93	0.86
vC, conflicting volume	425			462			954	909	469	873	911	479
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	257			314			608	560	322	521	562	319
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	99			100			98	100	99	97	100	98
cM capacity (veh/h)	1104			1047			308	366	581	394	377	587

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	417	407	15	24
Volume Left	8	5	7	10
Volume Right	8	4	8	14
cSH	1104	1047	411	487
Volume to Capacity	0.01	0.00	0.04	0.05
Queue Length 95th (ft)	1	0	3	4
Control Delay (s)	0.2	0.2	14.1	12.8
Lane LOS	A	A	B	B
Approach Delay (s)	0.2	0.2	14.1	12.8
Approach LOS			B	B

Intersection Summary					
Average Delay			0.8		
Intersection Capacity Utilization			45.0%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis
13: SR-24 NB Off-Ramp & 52nd Street

Children's Hospital
DC_2035 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	417	0	0	412	1157	0	1140	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	417	0	0	412	1157	0	1140	0	0
Pedestrians							50			
Lane Width (ft)							12.0			
Walking Speed (ft/s)							4.0			
Percent Blockage							4			
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.80						0.80		0.80	0.80
vC, conflicting volume	1569			467			2036	258	1760	879
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1202			467			1789	258	1443	336
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	459			1045			61	707	0	445

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	208	208	275	523	771	570	570
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	386	771	570	570
cSH	1700	1700	1700	1700	1700	707	707
Volume to Capacity	0.12	0.12	0.16	0.31	0.45	0.81	0.81
Queue Length 95th (ft)	0	0	0	0	0	210	210
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	27.8	27.8
Lane LOS						D	D
Approach Delay (s)	0.0		0.0			27.8	
Approach LOS						D	

Intersection Summary					
Average Delay			10.1		
Intersection Capacity Utilization			59.5%	ICU Level of Service	B
Analysis Period (min)			15		

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	50	350	957	200	90	962	180	170	290	100	191	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.98		1.00	0.99		1.00	0.98			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			0.99
Frt		1.00	0.97		1.00	0.98		1.00	0.96			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.97
Satd. Flow (prot)		1787	4911		1805	4990		1752	1740			1710
Flt Permitted		0.95	1.00		0.95	1.00		0.33	1.00			0.59
Satd. Flow (perm)		1787	4911		1805	4990		611	1740			1039
Peak-hour factor, PHF	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. Flow (vph)	50	350	957	200	90	962	180	170	290	100	191	170
RTOR Reduction (vph)	0	0	28	0	0	24	0	0	11	0	0	0
Lane Group Flow (vph)	0	400	1129	0	90	1118	0	170	379	0	0	361
Confl. Peds. (#/hr)				21	21		17			33	33	
Confl. Bikes (#/hr)				20			12			45		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		25.0	40.5		8.4	23.9		47.1	47.1			38.1
Effective Green, g (s)		25.0	40.5		8.4	23.9		47.1	47.1			38.1
Actuated g/C Ratio		0.23	0.37		0.08	0.22		0.43	0.43			0.35
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		406	1808		137	1084		313	745			359
v/s Ratio Prot		c0.22	0.23		0.05	c0.22		0.02	c0.22			
v/s Ratio Perm								0.21				c0.35
v/c Ratio		0.99	0.62		0.66	1.03		0.54	0.51			1.01
Uniform Delay, d1		42.3	28.5		49.4	43.0		24.5	23.0			36.0
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Incremental Delay, d2		41.1	1.6		10.8	35.6		1.9	2.5			48.9
Delay (s)		83.5	30.2		60.2	78.7		26.4	25.5			84.9
Level of Service		F	C		E	E		C	C			F
Approach Delay (s)			43.8			77.3			25.7			55.1
Approach LOS			D			E			C			E

Intersection Summary			
HCM 2000 Control Delay	53.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	110.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: 52nd Street & Shattuck Ave

Children's Hospital
DC_2035 PM Plus Phase 1

Movement	SBR
Lane Configurations	
Volume (vph)	387
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.93
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1405
Flt Permitted	1.00
Satd. Flow (perm)	1405
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	387
RTOR Reduction (vph)	253
Lane Group Flow (vph)	134
Confl. Peds. (#/hr)	27
Confl. Bikes (#/hr)	41
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	38.1
Effective Green, g (s)	38.1
Actuated g/C Ratio	0.35
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	486
v/s Ratio Prot	
v/s Ratio Perm	0.10
v/c Ratio	0.28
Uniform Delay, d1	26.0
Progression Factor	1.00
Incremental Delay, d2	1.4
Delay (s)	27.4
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
15: Telegraph Ave & 52nd Street/Claremont Ave

Children's Hospital
DC_2035 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	20	20	210	90	200	30	1177	340	200	831	321
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.94			0.98		1.00	0.91	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.95		1.00	0.90			0.97		1.00	0.96	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1642		1698	1508			3757		1770	3073	
Flt Permitted		0.98		0.95	1.00			0.90		0.95	1.00	
Satd. Flow (perm)		1642		1698	1508			3402		1770	3073	
Peak-hour factor, PHF	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. Flow (vph)	20	20	20	210	90	200	30	1177	340	200	831	321
RTOR Reduction (vph)	0	19	0	0	68	0	0	23	0	0	36	0
Lane Group Flow (vph)	0	41	0	189	243	0	0	1524	0	200	1116	0
Confl. Peds. (#/hr)	51					51	105		33			105
Confl. Bikes (#/hr)			2			15			53			72
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		6.2		19.6	19.6			43.0		13.2	60.7	
Effective Green, g (s)		6.2		19.6	19.6			43.0		13.2	60.7	
Actuated g/C Ratio		0.06		0.20	0.20			0.43		0.13	0.61	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		101		332	295			1462		233	1865	
v/s Ratio Prot		c0.03		0.11	c0.16					c0.11	0.36	
v/s Ratio Perm								c0.45				
v/c Ratio		0.41		0.57	0.83			1.04		0.86	0.60	
Uniform Delay, d1		45.1		36.4	38.6			28.5		42.5	12.1	
Progression Factor		1.81		1.00	1.00			0.50		1.00	1.00	
Incremental Delay, d2		0.8		2.2	16.9			26.5		25.4	1.4	
Delay (s)		82.5		38.6	55.5			40.7		67.9	13.6	
Level of Service		F		D	E			D		E	B	
Approach Delay (s)		82.5			49.1			40.7			21.6	
Approach LOS		F			D			D			C	

Intersection Summary				
HCM 2000 Control Delay	35.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	113.3%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
16: Telegraph Ave & 51St Street

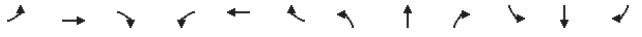
Children's Hospital
DC_2035 PM Plus Phase 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	327	750	111	80	580	240	121	980	190	310	681	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.97		1.00	0.97		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.96		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3380		1787	3307		1719	3270		1752	3362	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3380		1787	3307		1719	3270		1752	3362	
Peak-hour factor, PHF	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. Flow (vph)	327	750	111	80	580	240	121	980	190	310	681	70
RTOR Reduction (vph)	0	11	0	0	44	0	0	15	0	0	8	0
Lane Group Flow (vph)	327	850	0	80	776	0	121	1155	0	310	743	0
Confl. Peds. (#/hr)			78			57			86			138
Confl. Bikes (#/hr)			12			23			51			81
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.4	29.0		8.3	23.4		8.5	33.2		13.0	38.7	
Effective Green, g (s)	14.4	29.0		8.3	23.4		8.5	33.2		13.0	38.7	
Actuated g/C Ratio	0.14	0.29		0.08	0.23		0.08	0.33		0.13	0.39	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	489	980		148	773		146	1085		227	1301	
v/s Ratio Prot	c0.10	c0.25		0.04	c0.23		0.07	c0.35		c0.18	0.22	
v/s Ratio Perm												
v/c Ratio	0.67	0.87		0.54	1.00		0.83	1.06		1.37	0.57	
Uniform Delay, d1	40.5	33.7		44.0	38.3		45.0	33.4		43.5	24.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.14	0.71	
Incremental Delay, d2	3.5	10.2		4.0	33.2		30.5	46.1		186.0	1.5	
Delay (s)	44.0	43.9		48.0	71.5		75.5	79.5		235.5	18.7	
Level of Service	D	D		D	E		E	E		F	B	
Approach Delay (s)		43.9			69.4			79.1			82.1	
Approach LOS		D			E			E			F	

Intersection Summary				
HCM 2000 Control Delay	68.4	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	99.3%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	340	0	0	0	0	1782	0	0	0	0	1750	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	340	0	0	0	0	1782	0	0	0	0	1750	250
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	340	0	0	0	0	1782	0	0	0	0	1750	250
Confl. Peds. (#/hr)				3								
Confl. Bikes (#/hr)									14			
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	13.0					50.0					29.0	50.0
Effective Green, g (s)	13.0					50.0					29.0	50.0
Actuated g/C Ratio	0.26					1.00					0.58	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	850					1627					2072	2814
v/s Ratio Prot	0.10										0.49	0.09
v/s Ratio Perm						c1.10						
v/c Ratio	0.40					1.10					0.84	0.09
Uniform Delay, d1	15.3					25.0					8.6	0.0
Progression Factor	1.00					1.00					2.61	1.00
Incremental Delay, d2	1.4					53.1					3.3	0.0
Delay (s)	16.7					78.1					25.8	0.0
Level of Service	B					E					C	A
Approach Delay (s)		16.7			78.1			0.0			22.6	
Approach LOS		B			E			A			C	

Intersection Summary				
HCM 2000 Control Delay	46.1	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.30			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	64.7%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	160	10	100	139	0	60	0	150	10	70	10
Peak Hour 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
Hourly flow rate (vph)	0	160	10	100	139	0	60	0	150	10	70	10

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	170	239	60	150	90
Volume Left (vph)	0	100	60	0	10
Volume Right (vph)	10	0	0	150	10
Hadj (s)	-0.02	0.12	0.50	-0.70	-0.01
Departure Headway (s)	5.0	5.0	6.2	5.0	5.4
Degree Utilization, x	0.24	0.33	0.10	0.21	0.13
Capacity (veh/h)	668	675	547	671	606
Control Delay (s)	9.5	10.5	8.7	8.0	9.2
Approach Delay (s)	9.5	10.5	8.2		9.2
Approach LOS	A	B	A		A

Intersection Summary				
Delay	9.4			
Level of Service	A			
Intersection Capacity Utilization	46.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	150	10	20	129	50	10	10	10	20	10	10
Peak Hour 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
Hourly flow rate (vph)	10	150	10	20	129	50	10	10	10	20	10	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	170	199	30	40
Volume Left (vph)	10	20	10	20
Volume Right (vph)	10	50	10	10
Hadj (s)	-0.01	-0.13	-0.13	-0.05
Departure Headway (s)	4.3	4.1	4.6	4.7
Degree Utilization, x	0.20	0.23	0.04	0.05
Capacity (veh/h)	822	854	714	701
Control Delay (s)	8.3	8.3	7.8	7.9
Approach Delay (s)	8.3	8.3	7.8	7.9
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.3	
Level of Service			A	
Intersection Capacity Utilization			28.5%	ICU Level of Service
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (veh/h)	20	390	10	20	451	40	10	20	40	40	10	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	20	390	10	20	451	40	10	20	40	40	10	20
Pedestrians		8						11			5	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		1						1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	496			411			990	982	406	1001	967	484
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	496			411			990	982	406	1001	967	484
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			95	92	94	79	96	97
cM capacity (veh/h)	1069			1148			201	239	643	187	242	577

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	420	511	70	70
Volume Left	20	20	10	40
Volume Right	10	40	40	20
cSH	1069	1148	358	241
Volume to Capacity	0.02	0.02	0.20	0.29
Queue Length 95th (ft)	1	1	18	29
Control Delay (s)	0.6	0.5	17.5	25.9
Lane LOS	A	A	C	D
Approach Delay (s)	0.6	0.5	17.5	25.9
Approach LOS			C	D

Intersection Summary				
Average Delay			3.3	
Intersection Capacity Utilization			51.2%	ICU Level of Service
Analysis Period (min)			15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	123	2206	34	0	1913
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	123	2206	34	0	1913
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			154			137
pX, platoon unblocked	0.74	0.65			0.65	
vC, conflicting volume	2861	752			2240	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	673	0			1025	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	83			100	
cM capacity (veh/h)	287	705			438	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	123	882	882	475	638	638	638
Volume Left	0	0	0	0	0	0	0
Volume Right	123	0	0	34	0	0	0
cSH	705	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.17	0.52	0.52	0.28	0.38	0.38	0.38
Queue Length 95th (ft)	16	0	0	0	0	0	0
Control Delay (s)	11.2	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	11.2	0.0			0.0		
Approach LOS	B						

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	57.7%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	2102	20	0	1970
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	2102	20	0	1970
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			424			204
pX, platoon unblocked	0.74					
vC, conflicting volume	2769	711			2122	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2157	711			2122	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	30	376			253	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	0	841	841	440	657	657	657
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	20	0	0	0
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.49	0.49	0.26	0.39	0.39	0.39
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	0.0	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	44.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	20	200	250	60	270	100	21	180	1446	72	160	1531
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			0.99			1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.93			0.97			1.00	0.99		1.00	0.99
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1702			1741			1770	5027		1770	5037
Flt Permitted		0.98			0.79			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1663			1383			1770	5027		1770	5037
Peak-hour factor, PHF	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. Flow (vph)	20	200	250	60	270	100	21	180	1446	72	160	1531
RTOR Reduction (vph)	0	50	0	0	13	0	0	0	5	0	0	5
Lane Group Flow (vph)	0	420	0	0	417	0	0	201	1513	0	160	1596
Confl. Peds. (#/hr)	11		21	21		11				32		
Confl. Bikes (#/hr)			24			23				9		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		29.4			29.4			13.5	38.6		7.5	32.6
Effective Green, g (s)		29.4			29.4			13.5	38.6		7.5	32.6
Actuated g/C Ratio		0.33			0.33			0.15	0.43		0.08	0.36
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		543			451			265	2156		147	1824
v/s Ratio Prot								0.11	c0.30		0.09	c0.32
v/s Ratio Perm		0.25			c0.30							
v/c Ratio		0.77			0.92			0.76	0.70		1.09	0.87
Uniform Delay, d1		27.3			29.2			36.7	21.0		41.2	26.8
Progression Factor		1.00			1.00			0.55	0.32		1.00	1.00
Incremental Delay, d2		6.8			24.5			10.4	1.7		99.9	6.2
Delay (s)		34.1			53.8			30.8	8.3		141.1	33.0
Level of Service		C			D			C	A		F	C
Approach Delay (s)		34.1			53.8				11.0			42.8
Approach LOS		C			D				B			D

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	99.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	70
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	70
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	18
Confl. Bikes (#/hr)	11
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	382	10	30	370	10	10	10	20	10	10	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	382	10	30	370	10	10	10	20	10	10	30
Pedestrians		14			30			23			9	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			3			2			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked	0.87						0.87	0.87		0.87	0.87	0.87
vC, conflicting volume	389			415			954	919	440	946	919	398
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	229			415			875	835	440	866	835	240
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			97			95	96	97	95	96	96
cM capacity (veh/h)	1146			1112			201	246	594	203	244	683

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	422	410	40	50
Volume Left	30	30	10	10
Volume Right	10	10	20	30
cSH	1146	1112	322	373
Volume to Capacity	0.03	0.03	0.12	0.13
Queue Length 95th (ft)	2	2	10	11
Control Delay (s)	0.8	0.9	17.7	16.2
Lane LOS	A	A	C	C
Approach Delay (s)	0.8	0.9	17.7	16.2
Approach LOS			C	C

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	45.8%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
DC_2035 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	272	80	45	290	70	50	520	33	30	620	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.98			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.97			0.98			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		1717			1773			1835			1852	
Flt Permitted		0.78			0.90			0.91			0.96	
Satd. Flow (perm)		1347			1602			1674			1787	
Peak-hour factor, PHF	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. Flow (vph)	80	272	80	45	290	70	50	520	33	30	620	50
RTOR Reduction (vph)	0	10	0	0	10	0	0	2	0	0	3	0
Lane Group Flow (vph)	0	422	0	0	395	0	0	601	0	0	697	0
Confl. Peds. (#/hr)	9		20	20		9	11		26	26		11
Confl. Bikes (#/hr)			33			15			20			36
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		25.0			25.0			47.0			47.0	
Effective Green, g (s)		25.0			25.0			47.0			47.0	
Actuated g/C Ratio		0.31			0.31			0.59			0.59	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		420			500			983			1049	
v/s Ratio Prot												
v/s Ratio Perm		c0.31			0.25			0.36			c0.39	
v/c Ratio		1.00			0.79			0.61			0.66	
Uniform Delay, d1		27.5			25.1			10.6			11.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		44.9			12.1			2.8			3.3	
Delay (s)		72.4			37.2			13.4			14.5	
Level of Service		E			D			B			B	
Approach Delay (s)		72.4			37.2			13.4			14.5	
Approach LOS		E			D			B			B	

Intersection Summary				
HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	94.2%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
DC_2035 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	195	20	100	50	10	10	80	1130	60	40	1360	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	0.99		1.00	0.98	
Flpb, ped/bikes		1.00			0.99		1.00	1.00		0.99	1.00	
Frt		0.96			0.98		1.00	0.99		1.00	0.97	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1649			1711		1770	3493		1775	3423	
Flt Permitted		0.77			0.72		0.10	1.00		0.17	1.00	
Satd. Flow (perm)		1309			1280		182	3493		324	3423	
Peak-hour factor, PHF	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. Flow (vph)	195	20	100	50	10	10	80	1130	60	40	1360	305
RTOR Reduction (vph)	0	19	0	0	7	0	0	5	0	0	23	0
Lane Group Flow (vph)	0	296	0	0	63	0	80	1185	0	40	1642	0
Confl. Peds. (#/hr)	9		17	17		9	20		26	26		20
Confl. Bikes (#/hr)			23			23			65			41
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.1			20.1		40.9	40.9		40.9	40.9	
Effective Green, g (s)		20.1			20.1		40.9	40.9		40.9	40.9	
Actuated g/C Ratio		0.29			0.29		0.58	0.58		0.58	0.58	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		375			367		106	2040		189	2000	
v/s Ratio Prot								0.34			c0.48	
v/s Ratio Perm		c0.23			0.05		0.44			0.12		
v/c Ratio		0.79			0.17		0.75	0.58		0.21	0.82	
Uniform Delay, d1		23.0			18.7		10.8	9.2		6.9	11.6	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		10.8			0.2		38.7	1.2		2.5	3.9	
Delay (s)		33.8			18.9		49.5	10.4		9.4	15.6	
Level of Service		C			B		D	B		A	B	
Approach Delay (s)		33.8			18.9			12.8			15.4	
Approach LOS		C			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	83.5%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	10	10	60	10	10	10	11	30	1687	26	10	1802
Sign Control		Stop			Stop				Free			Free
Grade		0%			0%				0%			0%
Peak Hour 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
Hourly flow rate (vph)	10	10	60	10	10	10	0	30	1687	26	10	1802
Pedestrians		11			9				12			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		1			1				1			
Right turn flare (veh)												
Median type									None			None
Median storage veh)												
Upstream signal (ft)									299			294
pX, platoon unblocked	0.81	0.81	0.71	0.81	0.81	0.80	0.00	0.71			0.80	
vC, conflicting volume	2475	3620	629	2467	3612	584	0	1823			1722	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	350	1769	0	340	1759	0	0	723			1045	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			4.1	
tC, 2 stage (s)												
tF (s)	*5.0	*5.0	*5.0	*5.0	*5.0	*5.0	0.0	2.2			2.2	
p0 queue free %	96	83	88	96	83	98	0	95			98	
cM capacity (veh/h)	282	59	501	253	60	575	0	615			533	

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	80	30	452	844	448	460	901	460
Volume Left	10	10	30	0	0	10	0	0
Volume Right	60	10	0	0	26	0	0	10
cSH	246	133	615	1700	1700	533	1700	1700
Volume to Capacity	0.33	0.22	0.05	0.50	0.26	0.02	0.53	0.27
Queue Length 95th (ft)	34	20	4	0	0	1	0	0
Control Delay (s)	26.6	39.6	1.4	0.0	0.0	0.6	0.0	0.0
Lane LOS	D	E	A			A		
Approach Delay (s)	26.6	39.6	0.4			0.1		
Approach LOS	D	E						

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	77.7%	ICU Level of Service	D	
Analysis Period (min)	15			

* User Entered Value

Movement	SBR
Lane Configurations	
Volume (veh/h)	10
Sign Control	
Grade	
Peak Hour Factor	1.00
Hourly flow rate (vph)	10
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	
tC, single (s)	
tC, 2 stage (s)	
tF (s)	
p0 queue free %	
cM capacity (veh/h)	

Direction, Lane #

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	16	10	10	10	10	10	20	20	10	40	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	16	10	10	10	10	10	20	20	10	40	10
Pedestrians		15			21			3			9	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	154	161	63	157	156	60	65			61		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	154	161	63	157	156	60	65			61		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	98	99	99	99	99	99			99		
cM capacity (veh/h)	759	704	992	751	708	986	1531			1528		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	36	30	50	60
Volume Left	10	10	10	10
Volume Right	10	10	20	10
cSH	783	798	1531	1528
Volume to Capacity	0.05	0.04	0.01	0.01
Queue Length 95th (ft)	4	3	0	0
Control Delay (s)	9.8	9.7	1.5	1.3
Lane LOS	A	A	A	A
Approach Delay (s)	9.8	9.7	1.5	1.3
Approach LOS	A	A		

Intersection Summary				
Average Delay	4.5			
Intersection Capacity Utilization	21.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	26	20	593	715	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	26	20	593	715	10
Pedestrians	14			3	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.76	0.75	0.75			
vC, conflicting volume	1369	737	739			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1289	484	487			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	94	97			
cM capacity (veh/h)	133	434	799			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	36	613	725
Volume Left	10	20	0
Volume Right	26	0	10
cSH	267	799	1700
Volume to Capacity	0.14	0.03	0.43
Queue Length 95th (ft)	12	2	0
Control Delay (s)	20.6	0.7	0.0
Lane LOS	C	A	
Approach Delay (s)	20.6	0.7	0.0
Approach LOS	C		

Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	58.3%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
8: MLK Way & 53rd Street

Children's Hospital
DC_2035 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	1	59	60	10	18	30	1726	113	4	1884	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.98			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Frt		0.89			0.97		1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1603			1765		1770	5015		1787	5129	
Flt Permitted		0.96			0.80		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1548			1459		1770	5015		1787	5129	
Peak-hour factor, PHF	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. Flow (vph)	10	1	59	60	10	18	30	1726	113	4	1884	10
RTOR Reduction (vph)	0	48	0	0	13	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	22	0	0	75	0	30	1835	0	4	1894	0
Confl. Peds. (#/hr)	11		20	20		11			20			30
Confl. Bikes (#/hr)									8			20
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		16.8			16.8		4.5	58.9		1.8	56.2	
Effective Green, g (s)		16.8			16.8		4.5	58.9		1.8	56.2	
Actuated g/C Ratio		0.19			0.19		0.05	0.65		0.02	0.62	
Clearance Time (s)		5.0			5.0		4.0	3.5		4.0	3.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		288			272		88	3282		35	3202	
v/s Ratio Prot							0.02	c0.37		0.00	c0.37	
v/s Ratio Perm		0.01			c0.05							
v/c Ratio		0.08			0.28		0.34	0.56		0.11	0.59	
Uniform Delay, d1		30.2			31.4		41.3	8.5		43.3	10.1	
Progression Factor		1.00			0.99		1.18	0.60		0.47	0.26	
Incremental Delay, d2		0.1			0.6		1.6	0.5		0.8	0.5	
Delay (s)		30.3			31.7		50.3	5.6		21.4	3.1	
Level of Service		C			C		D	A		C	A	
Approach Delay (s)		30.3			31.7			6.3			3.1	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	5.8	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5	
Intersection Capacity Utilization	63.3%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
9: Dover Street & 53rd Street

Children's Hospital
DC_2035 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	50	30	0	0	20	10	0	0	0	10	0	50
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	50	30	0	0	20	10	0	0	0	10	0	50
Pedestrians		33			32			3			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			3			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	101	110	61	95	135	35	83			32		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	101	110	61	95	135	35	83			32		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	96	100	100	97	99	100			99		
cM capacity (veh/h)	794	737	980	802	714	1013	1485			1551		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	80	30	0	60
Volume Left	50	0	0	10
Volume Right	0	10	0	50
cSH	772	792	1700	1551
Volume to Capacity	0.10	0.04	0.00	0.01
Queue Length 95th (ft)	9	3	0	0
Control Delay (s)	10.2	9.7	0.0	1.3
Lane LOS	B	A		A
Approach Delay (s)	10.2	9.7	0.0	1.3
Approach LOS	B	A		

Intersection Summary				
Average Delay	7.0			
Intersection Capacity Utilization	28.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	68	85	120	101	105	338	60	110	1611	130	36	182
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.95			1.00	0.97		1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00			0.98	1.00		1.00	1.00			1.00
Frt	1.00	0.91			1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00			0.98	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1771	1634			1777	1534		1787	5060			1787
Flt Permitted	0.53	1.00			0.64	1.00		0.95	1.00			0.95
Satd. Flow (perm)	995	1634			1158	1534		1787	5060			1787
Peak-hour factor, PHF	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. Flow (vph)	68	85	120	101	105	338	60	110	1611	130	36	182
RTOR Reduction (vph)	0	60	0	0	0	172	0	0	9	0	0	0
Lane Group Flow (vph)	68	145	0	0	206	166	0	170	1732	0	0	218
Confl. Peds. (#/hr)	15		74	74		15				11		
Confl. Bikes (#/hr)			9			8				2		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	23.7	23.7			23.7	23.7		7.5	40.3			12.5
Effective Green, g (s)	23.7	23.7			23.7	23.7		7.5	40.3			12.5
Actuated g/C Ratio	0.26	0.26			0.26	0.26		0.08	0.45			0.14
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	262	430			304	403		148	2265			248
v/s Ratio Prot		0.09						c0.10	c0.34			c0.12
v/s Ratio Perm	0.07				c0.18	0.11						
v/c Ratio	0.26	0.34			0.68	0.41		1.15	0.76			0.88
Uniform Delay, d1	26.2	26.8			29.7	27.4		41.2	20.9			38.0
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.09			0.84
Incremental Delay, d2	0.2	0.2			4.7	0.2		91.5	0.9			24.0
Delay (s)	26.4	27.0			34.4	27.6		132.8	23.6			56.1
Level of Service	C	C			C	C		F	C			E
Approach Delay (s)		26.8			30.2				33.3			
Approach LOS		C			C				C			

Intersection Summary			
HCM 2000 Control Delay	27.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	110.3%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: MLK Way & 52nd Street

Children's Hospital
DC_2035 AM Plus Phase 2

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1768	7
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5131	
Flt Permitted	1.00	
Satd. Flow (perm)	5131	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1768	7
RTOR Reduction (vph)	1	0
Lane Group Flow (vph)	1774	0
Confl. Peds. (#/hr)		15
Confl. Bikes (#/hr)		15
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	44.8	
Effective Green, g (s)	44.8	
Actuated g/C Ratio	0.50	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2554	
v/s Ratio Prot	0.35	
v/s Ratio Perm		
v/c Ratio	0.69	
Uniform Delay, d1	17.4	
Progression Factor	0.88	
Incremental Delay, d2	1.4	
Delay (s)	16.6	
Level of Service	B	
Approach Delay (s)	21.0	
Approach LOS	C	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	368	5	2	510	2	7	3	5	0	2	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.93			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.95			0.88	
Flt Protected		1.00			1.00			0.98			1.00	
Satd. Flow (prot)		1854			1898			1424			1655	
Flt Permitted		1.00			1.00			0.95			1.00	
Satd. Flow (perm)		1848			1896			1386			1655	
Peak-hour factor, PHF	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. Flow (vph)	4	368	5	2	510	2	7	3	5	0	2	15
RTOR Reduction (vph)	0	1	0	0	0	0	0	3	0	0	8	0
Lane Group Flow (vph)	0	376	0	0	514	0	0	12	0	0	9	0
Confl. Peds. (#/hr)	26		83	83		26			303	303		
Confl. Bikes (#/hr)			9			8						2
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		21.0			21.0			23.0			23.0	
Effective Green, g (s)		21.0			21.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.42			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		776			796			637			761	
v/s Ratio Prot											0.01	
v/s Ratio Perm		0.20			c0.27			c0.01				
v/c Ratio		0.48			0.65			0.02			0.01	
Uniform Delay, d1		10.6			11.5			7.4			7.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.2			4.0			0.1			0.0	
Delay (s)		12.7			15.6			7.4			7.4	
Level of Service		B			B			A			A	
Approach Delay (s)		12.7			15.6			7.4			7.4	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.32			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	6.0	
Intersection Capacity Utilization	54.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	12	297	75	45	477	5	36	0	28	2	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	12	297	75	45	477	5	36	0	28	2	0	6
Pedestrians		30			15			18			35	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			1			1			3	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.81			0.85			0.88	0.88	0.85	0.88	0.88	0.81
vC, conflicting volume	517			390			982	984	368	1006	1018	544
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	282			201			539	540	174	566	580	316
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	99			96			90	100	96	99	100	99
cM capacity (veh/h)	999			1159			343	349	705	330	342	557

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	384	527	64	8
Volume Left	12	45	36	2
Volume Right	75	5	28	6
cSH	999	1159	442	475
Volume to Capacity	0.01	0.04	0.14	0.02
Queue Length 95th (ft)	1	3	13	1
Control Delay (s)	0.4	1.1	14.5	12.7
Lane LOS	A	A	B	B
Approach Delay (s)	0.4	1.1	14.5	12.7
Approach LOS			B	B

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	62.4%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
13: SR-24 NB Off-Ramp & 52nd Street

Children's Hospital
DC_2035 AM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	333	0	0	536	1271	0	1100	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	333	0	0	536	1271	0	1100	0	0
Pedestrians							36			
Lane Width (ft)							12.0			
Walking Speed (ft/s)							4.0			
Percent Blockage							3			
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.77						0.77		0.77	0.77
vC, conflicting volume	1807			369			2176	202	1802	905
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1449			369			1929	202	1443	276
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	356			1151			49	777	0	470

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	166	166	357	602	847	550	550
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	424	847	550	550
cSH	1700	1700	1700	1700	1700	777	777
Volume to Capacity	0.10	0.10	0.21	0.35	0.50	0.71	0.71
Queue Length 95th (ft)	0	0	0	0	0	150	150
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	20.0	20.0
Lane LOS						C	C
Approach Delay (s)	0.0		0.0			20.0	
Approach LOS						C	

Intersection Summary				
Average Delay	6.8			
Intersection Capacity Utilization	57.2%	ICU Level of Service		B
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
14: 52nd Street & Shattuck Ave

Children's Hospital
DC_2035 AM Plus Phase 2

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	50	303	920	160	50	1161	150	180	150	60	145	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.99		1.00	0.99		1.00	0.99			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.98		1.00	0.98		1.00	0.96			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.98
Satd. Flow (prot)		1787	4960		1805	5072		1752	1748			1730
Flt Permitted		0.95	1.00		0.95	1.00		0.32	1.00			0.76
Satd. Flow (perm)		1787	4960		1805	5072		586	1748			1349
Peak-hour factor, PHF	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. Flow (vph)	50	303	920	160	50	1161	150	180	150	60	145	190
RTOR Reduction (vph)	0	0	25	0	0	17	0	0	16	0	0	0
Lane Group Flow (vph)	0	353	1055	0	50	1294	0	180	194	0	0	335
Confl. Peds. (#/hr)				18			8			15	15	
Confl. Bikes (#/hr)				18			2			15		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		19.0	37.1		3.6	21.7		35.3	35.3			26.3
Effective Green, g (s)		19.0	37.1		3.6	21.7		35.3	35.3			26.3
Actuated g/C Ratio		0.21	0.41		0.04	0.24		0.39	0.39			0.29
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		377	2044		72	1222		294	685			394
v/s Ratio Prot		c0.20	0.21		0.03	c0.26		c0.03	0.11			
v/s Ratio Perm								0.21				c0.25
v/c Ratio		0.94	0.52		0.69	1.06		0.61	0.28			0.85
Uniform Delay, d1		34.9	19.7		42.7	34.1		21.7	18.7			30.0
Progression Factor		1.00	1.00		1.01	0.88		1.00	1.00			1.00
Incremental Delay, d2		32.8	0.9		17.3	38.3		3.7	1.0			20.0
Delay (s)		67.7	20.7		60.6	68.4		25.4	19.7			50.0
Level of Service		E	C		E	E		C	B			D
Approach Delay (s)			32.3			68.2			22.4			38.5
Approach LOS			C			E			C			D

Intersection Summary					
HCM 2000 Control Delay	44.9	HCM 2000 Level of Service		D	
HCM 2000 Volume to Capacity ratio	0.92				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		18.0	
Intersection Capacity Utilization	112.2%	ICU Level of Service		H	
Analysis Period (min)	15				

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	416
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.92
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1387
Flt Permitted	1.00
Satd. Flow (perm)	1387
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	416
RTOR Reduction (vph)	240
Lane Group Flow (vph)	176
Confl. Peds. (#/hr)	24
Confl. Bikes (#/hr)	62
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	26.3
Effective Green, g (s)	26.3
Actuated g/C Ratio	0.29
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	405
v/s Ratio Prot	
v/s Ratio Perm	0.13
v/c Ratio	0.43
Uniform Delay, d1	25.8
Progression Factor	1.00
Incremental Delay, d2	3.4
Delay (s)	29.2
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	10	120	70	230	10	1010	140	130	900	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.98			0.99		1.00	0.96	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.95		1.00	0.89			0.98		1.00	0.95	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1641		1698	1560			3863		1770	3202	
Flt Permitted		0.98		0.95	1.00			0.94		0.95	1.00	
Satd. Flow (perm)		1641		1698	1560			3625		1770	3202	
Peak-hour factor, PHF	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. Flow (vph)	10	10	10	120	70	230	10	1010	140	130	900	500
RTOR Reduction (vph)	0	10	0	0	129	0	0	9	0	0	61	0
Lane Group Flow (vph)	0	21	0	108	183	0	0	1151	0	130	1339	0
Confl. Peds. (#/hr)	6					6	33		27			33
Confl. Bikes (#/hr)			2			3			50			41
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		4.5		17.1	17.1			40.6		9.8	54.9	
Effective Green, g (s)		4.5		17.1	17.1			40.6		9.8	54.9	
Actuated g/C Ratio		0.05		0.19	0.19			0.45		0.11	0.61	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		82		322	296			1635		192	1953	
v/s Ratio Prot		c0.01		0.06	c0.12					0.07	c0.42	
v/s Ratio Perm								0.32				
v/c Ratio		0.25		0.34	0.62			0.70		0.68	0.69	
Uniform Delay, d1		41.1		31.5	33.5			19.9		38.6	11.8	
Progression Factor		1.49		1.00	1.00			0.94		1.00	1.00	
Incremental Delay, d2		0.8		0.6	3.8			1.8		9.1	2.0	
Delay (s)		62.0		32.2	37.3			20.5		47.7	13.7	
Level of Service		E		C	D			C		D	B	
Approach Delay (s)		62.0			36.0			20.5			16.6	
Approach LOS		E			D			C			B	

Intersection Summary					
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C		
HCM 2000 Volume to Capacity ratio	0.69				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0		
Intersection Capacity Utilization	102.1%	ICU Level of Service	G		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	330	662	103	130	594	320	137	510	80	220	740	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.97		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3397		1787	3293		1719	3324		1752	3420	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3397		1787	3293		1719	3324		1752	3420	
Peak-hour factor, PHF	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. Flow (vph)	330	662	103	130	594	320	137	510	80	220	740	70
RTOR Reduction (vph)	0	14	0	0	80	0	0	13	0	0	8	0
Lane Group Flow (vph)	330	751	0	130	834	0	137	577	0	220	802	0
Confl. Peds. (#/hr)			47			47			45			56
Confl. Bikes (#/hr)			14			11			41			41
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	12.9	27.3		10.6	25.5		10.8	23.6		12.0	25.8	
Effective Green, g (s)	12.9	27.3		10.6	25.5		10.8	23.6		12.0	25.8	
Actuated g/C Ratio	0.14	0.30		0.12	0.28		0.12	0.26		0.13	0.29	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	487	1030		210	933		206	871		233	980	
v/s Ratio Prot	c0.10	0.22		0.07	c0.25		0.08	0.17		c0.13	c0.23	
v/s Ratio Perm												
v/c Ratio	0.68	0.73		0.62	0.89		0.67	0.66		0.94	0.82	
Uniform Delay, d1	36.6	28.0		37.8	31.0		37.9	29.6		38.7	29.9	
Progression Factor	1.26	0.82		1.00	1.00		1.00	1.00		1.24	0.84	
Incremental Delay, d2	3.2	3.9		5.3	12.9		7.8	3.9		37.3	6.0	
Delay (s)	49.3	26.9		43.1	43.8		45.7	33.6		85.2	31.1	
Level of Service	D	C		D	D		D	C		F	C	
Approach Delay (s)		33.7			43.7			35.9			42.7	
Approach LOS		C			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	39.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	81.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	263	0	0	0	0	1644	0	0	0	0	1737	262
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	263	0	0	0	0	1644	0	0	0	0	1737	262
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	263	0	0	0	0	1644	0	0	0	0	1737	262
Confl. Peds. (#/hr)				9								
Confl. Bikes (#/hr)									3			
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	8.0					45.0					29.0	45.0
Effective Green, g (s)	8.0					45.0					29.0	45.0
Actuated g/C Ratio	0.18					1.00					0.64	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	581					1627					2303	2814
v/s Ratio Prot	0.08										0.49	0.09
v/s Ratio Perm						c1.01						
v/c Ratio	0.45					1.01					0.75	0.09
Uniform Delay, d1	16.5					22.5					5.5	0.0
Progression Factor	1.00					1.00					2.06	1.00
Incremental Delay, d2	2.5					24.9					1.7	0.0
Delay (s)	19.1					47.4					13.1	0.0
Level of Service	B					D					B	A
Approach Delay (s)		19.1			47.4			0.0			11.4	
Approach LOS		B			D			A			B	

Intersection Summary				
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	1.23			
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	62.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	193	20	80	132	0	40	0	80	10	60	10
Peak Hour 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
Hourly flow rate (vph)	0	193	20	80	132	0	40	0	80	10	60	10

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	213	212	40	80	80
Volume Left (vph)	0	80	40	0	10
Volume Right (vph)	20	0	0	80	10
Hadj (s)	-0.04	0.11	0.50	-0.70	-0.02
Departure Headway (s)	4.7	4.8	6.1	4.9	5.2
Degree Utilization, x	0.28	0.28	0.07	0.11	0.12
Capacity (veh/h)	729	712	544	667	626
Control Delay (s)	9.4	9.7	8.4	7.3	8.9
Approach Delay (s)	9.4	9.7	7.7		8.9
Approach LOS	A	A	A		A

Intersection Summary					
Delay			9.1		
Level of Service			A		
Intersection Capacity Utilization			44.9%	ICU Level of Service	A
Analysis Period (min)			15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	20	173	10	10	142	30	10	10	10	30	10	10
Peak Hour 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
Hourly flow rate (vph)	20	173	10	10	142	30	10	10	10	30	10	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	203	182	30	50
Volume Left (vph)	20	10	10	30
Volume Right (vph)	10	30	10	10
Hadj (s)	0.01	-0.09	-0.13	0.00
Departure Headway (s)	4.3	4.2	4.7	4.8
Degree Utilization, x	0.24	0.21	0.04	0.07
Capacity (veh/h)	816	819	702	686
Control Delay (s)	8.7	8.4	7.9	8.1
Approach Delay (s)	8.7	8.4	7.9	8.1
Approach LOS	A	A	A	A

Intersection Summary					
Delay			8.4		
Level of Service			A		
Intersection Capacity Utilization			28.8%	ICU Level of Service	A
Analysis Period (min)			15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	400	10	10	440	20	10	20	20	40	20	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	400	10	10	440	20	10	20	20	40	20	10
Pedestrians		12			3			15			17	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	477			425			942	937	423	945	932	479
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	477			425			942	937	423	945	932	479
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			95	92	97	81	92	98
cM capacity (veh/h)	1075			1131			214	255	626	209	255	573

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	420	470	50	70
Volume Left	10	10	10	40
Volume Right	10	20	20	10
cSH	1075	1131	318	244
Volume to Capacity	0.01	0.01	0.16	0.29
Queue Length 95th (ft)	1	1	14	29
Control Delay (s)	0.3	0.3	18.4	25.6
Lane LOS	A	A	C	D
Approach Delay (s)	0.3	0.3	18.4	25.6
Approach LOS			C	D

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	46.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	34	1842	201	0	2003
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	34	1842	201	0	2003
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			154			137
pX, platoon unblocked	0.83	0.71			0.71	
vC, conflicting volume	2610	714			2043	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	392	0			1059	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	483	774			466	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	34	737	737	569	668	668	668
Volume Left	0	0	0	0	0	0	0
Volume Right	34	0	0	201	0	0	0
cSH	774	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.04	0.43	0.43	0.33	0.39	0.39	0.39
Queue Length 95th (ft)	3	0	0	0	0	0	0
Control Delay (s)	9.9	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	9.9	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	50.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	1907	0	0	2049
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	1907	0	0	2049
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			424			204
pX, platoon unblocked	0.73					
vC, conflicting volume	2590	636			1907	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1891	636			1907	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	45	421			308	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	0	763	763	381	683	683	683
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.45	0.45	0.22	0.40	0.40	0.40
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	0.0	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	42.9%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	20	270	180	60	240	110	29	211	1783	166	200	1474
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			0.99			1.00	0.99		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.95			0.96			1.00	0.99		1.00	1.00
Flt Protected		1.00			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1747			1728			1770	4975		1770	5054
Flt Permitted		0.97			0.75			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1707			1310			1770	4975		1770	5054
Peak-hour factor, PHF	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. Flow (vph)	20	270	180	60	240	110	29	211	1783	166	200	1474
RTOR Reduction (vph)	0	23	0	0	14	0	0	0	10	0	0	3
Lane Group Flow (vph)	0	447	0	0	396	0	0	240	1939	0	200	1511
Confl. Peds. (#/hr)	17		23	23		17				30		
Confl. Bikes (#/hr)			24			18				23		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		31.7			31.7			21.5	42.3		11.5	32.3
Effective Green, g (s)		31.7			31.7			21.5	42.3		11.5	32.3
Actuated g/C Ratio		0.32			0.32			0.22	0.42		0.12	0.32
Clearance Time (s)		5.0			5.0			4.5	5.0		4.5	5.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		541			415			380	2104		203	1632
v/s Ratio Prot								0.14	c0.39		0.11	c0.30
v/s Ratio Perm		0.26			c0.30							
v/c Ratio		0.83			0.96			0.63	0.92		0.99	0.93
Uniform Delay, d1		31.6			33.5			35.7	27.3		44.2	32.7
Progression Factor		1.00			1.00			0.56	0.43		1.00	1.00
Incremental Delay, d2		10.0			32.5			2.7	6.7		58.5	10.5
Delay (s)		41.6			66.0			22.6	18.4		102.6	43.2
Level of Service		D			E			C	B		F	D
Approach Delay (s)		41.6			66.0				18.9			50.1
Approach LOS		D			E				B			D

Intersection Summary			
HCM 2000 Control Delay	36.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	106.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: MLK Way & 55th Street

Children's Hospital
DC_2035 PM Plus Phase 2

Movement	SBR
Lane Configurations	
Volume (vph)	40
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	40
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	18
Confl. Bikes (#/hr)	23
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis
2: Dover Street & 55th Street

Children's Hospital
DC_2035 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	586	20	10	330	20	20	20	30	20	20	40
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	30	586	20	10	330	20	20	20	30	20	20	40
Pedestrians		6			20			11			26	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		641			677							
pX, platoon unblocked	0.96						0.96	0.96		0.96	0.96	0.96
vC, conflicting volume	376			617			1083	1063	627	1102	1063	372
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	329			617			1065	1045	627	1085	1045	325
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			99			87	90	94	86	90	94
cM capacity (veh/h)	1140			945			158	207	475	147	204	667

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	636	360	70	80
Volume Left	30	10	20	20
Volume Right	20	20	30	40
cSH	1140	945	244	272
Volume to Capacity	0.03	0.01	0.29	0.29
Queue Length 95th (ft)	2	1	29	30
Control Delay (s)	0.7	0.4	25.6	23.6
Lane LOS	A	A	D	C
Approach Delay (s)	0.7	0.4	25.6	23.6
Approach LOS			D	C

Intersection Summary				
Average Delay			3.7	
Intersection Capacity Utilization			62.2%	ICU Level of Service
Analysis Period (min)			15	

HCM Signalized Intersection Capacity Analysis
3: 55th Street & Shattuck Ave

Children's Hospital
DC_2035 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	446	70	32	210	50	80	630	56	30	580	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.99			0.99			1.00			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.99			0.99	
Flt Protected		0.99			0.99			0.99			1.00	
Satd. Flow (prot)		1750			1773			1825			1843	
Flt Permitted		0.86			0.90			0.88			0.95	
Satd. Flow (perm)		1517			1601			1612			1756	
Peak-hour factor, PHF	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. Flow (vph)	110	446	70	32	210	50	80	630	56	30	580	60
RTOR Reduction (vph)	0	6	0	0	10	0	0	4	0	0	5	0
Lane Group Flow (vph)	0	620	0	0	282	0	0	762	0	0	665	0
Confl. Peds. (#/hr)	17		17	17		17	29		11	11		29
Confl. Bikes (#/hr)			23			15			47			33
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4	4		8		
Actuated Green, G (s)		29.0			29.0			43.0			43.0	
Effective Green, g (s)		29.0			29.0			43.0			43.0	
Actuated g/C Ratio		0.36			0.36			0.54			0.54	
Clearance Time (s)		3.0			3.0			5.0			5.0	
Lane Grp Cap (vph)		549			580			866			943	
v/s Ratio Prot												
v/s Ratio Perm		c0.41			0.18			c0.47			0.38	
v/c Ratio		1.13			0.49			0.88			0.71	
Uniform Delay, d1		25.5			19.7			16.2			13.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		79.4			2.9			12.4			4.4	
Delay (s)		104.9			22.7			28.7			18.2	
Level of Service		F			C			C			B	
Approach Delay (s)		104.9			22.7			28.7			18.2	
Approach LOS		F			C			C			B	

Intersection Summary				
HCM 2000 Control Delay		45.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio		0.98		
Actuated Cycle Length (s)		80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization		128.0%	ICU Level of Service	H
Analysis Period (min)		15		
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: 55th Street & Telegraph Ave

Children's Hospital
DC_2035 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	321	30	171	50	20	20	130	1216	70	20	1136	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.98			0.99		1.00	0.99		1.00	0.98	
Flpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Frt		0.96			0.97		1.00	0.99		1.00	0.99	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1626			1696		1770	3489		1787	3468	
Flt Permitted		0.78			0.71		0.12	1.00		0.11	1.00	
Satd. Flow (perm)		1300			1246		219	3489		206	3468	
Peak-hour factor, PHF	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. Flow (vph)	321	30	171	50	20	20	130	1216	70	20	1136	122
RTOR Reduction (vph)	0	19	0	0	12	0	0	4	0	0	9	0
Lane Group Flow (vph)	0	503	0	0	78	0	130	1282	0	20	1249	0
Confl. Peds. (#/hr)	17		39	39		17	38		26	26		38
Confl. Bikes (#/hr)			12			14			44			68
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		35.5			35.5		45.5	45.5		45.5	45.5	
Effective Green, g (s)		35.5			35.5		45.5	45.5		45.5	45.5	
Actuated g/C Ratio		0.39			0.39		0.51	0.51		0.51	0.51	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		512			491		110	1763		104	1753	
v/s Ratio Prot								0.37			0.36	
v/s Ratio Perm		c0.39			0.06		c0.59			0.10		
v/c Ratio		0.98			0.16		1.18	0.73		0.19	0.71	
Uniform Delay, d1		26.9			17.6		22.2	17.4		12.2	17.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		34.9			0.2		142.8	2.7		4.1	2.5	
Delay (s)		61.8			17.8		165.0	20.1		16.3	19.7	
Level of Service		E			B		F	C		B	B	
Approach Delay (s)		61.8			17.8			33.4			19.6	
Approach LOS		E			B			C			B	

Intersection Summary				
HCM 2000 Control Delay	32.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	1.09			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	91.6%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
5: MLK Way & 54th Street

Children's Hospital
DC_2035 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (veh/h)	10	10	50	20	10	10	13	40	2131	48	10	20
Sign Control		Stop			Stop				Free			
Grade		0%			0%				0%			
Peak Hour 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
Hourly flow rate (vph)	10	10	50	20	10	10	0	40	2131	48	0	20
Pedestrians		8			29				17			
Lane Width (ft)		12.0			12.0				12.0			
Walking Speed (ft/s)		4.0			4.0				4.0			
Percent Blockage		1			2				1			
Right turn flare (veh)												
Median type									None			
Median storage veh)												
Upstream signal (ft)									299			
pX, platoon unblocked	0.85	0.85	0.71	0.85	0.85	0.72	0.00	0.71			0.00	0.72
vC, conflicting volume	2536	4019	593	2934	4005	763	0	1701			0	2208
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0	1728	0	457	1712	0	0	580			0	1320
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			0.0	4.1
tC, 2 stage (s)												
tF (s)	*7.5	*7.5	*7.5	*7.5	*7.5	*7.5	0.0	2.2			0.0	2.2
p0 queue free %	97	83	85	87	83	97	0	94			0	95
cM capacity (veh/h)	309	58	336	157	59	338	0	702			0	369

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	70	40	573	1066	581	438	836	438
Volume Left	10	20	40	0	0	20	0	0
Volume Right	50	10	0	0	48	0	0	20
cSH	198	122	702	1700	1700	369	1700	1700
Volume to Capacity	0.35	0.33	0.06	0.63	0.34	0.05	0.49	0.26
Queue Length 95th (ft)	38	32	5	0	0	4	0	0
Control Delay (s)	32.9	48.0	1.5	0.0	0.0	1.7	0.0	0.0
Lane LOS	D	E	A			A		
Approach Delay (s)	32.9	48.0	0.4			0.4		
Approach LOS	D	E						

Intersection Summary				
Average Delay	1.5			
Intersection Capacity Utilization	95.6%	ICU Level of Service	F	
Analysis Period (min)	15			

* User Entered Value

Movement	SBT	SBR
Lane Configurations		
Volume (veh/h)	1673	20
Sign Control	Free	
Grade	0%	
Peak Hour Factor	1.00	1.00
Hourly flow rate (vph)	1673	20
Pedestrians		
Lane Width (ft)		
Walking Speed (ft/s)		
Percent Blockage		
Right turn flare (veh)		
Median type	None	
Median storage veh)		
Upstream signal (ft)	294	
pX, platoon unblocked		
vC, conflicting volume		
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol		
tC, single (s)		
tC, 2 stage (s)		
tF (s)		
p0 queue free %		
cM capacity (veh/h)		

Direction, Lane #

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	48	10	10	10	20	10	50	10	10	30	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	10	48	10	10	10	20	10	50	10	10	30	10
Pedestrians		18			12			9			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	178	165	62	185	165	72	58			72		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	178	165	62	185	165	72	58			72		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	93	99	99	99	98	99			99		
cM capacity (veh/h)	728	704	986	699	704	982	1536			1526		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	68	40	70	50
Volume Left	10	10	10	10
Volume Right	10	20	10	10
cSH	738	818	1536	1526
Volume to Capacity	0.09	0.05	0.01	0.01
Queue Length 95th (ft)	8	4	0	0
Control Delay (s)	10.4	9.6	1.1	1.5
Lane LOS	B	A	A	A
Approach Delay (s)	10.4	9.6	1.1	1.5
Approach LOS	B	A		

Intersection Summary				
Average Delay	5.4			
Intersection Capacity Utilization	21.9%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
7: Shattuck Ave & 54th Street

Children's Hospital
DC_2035 PM Plus Phase 2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	48	20	776	702	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	48	20	776	702	10
Pedestrians	38				2	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	3				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				550	282	
pX, platoon unblocked	0.80	0.74	0.74			
vC, conflicting volume	1563	745	750			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1253	478	485			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	89	97			
cM capacity (veh/h)	144	423	771			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	58	796	712
Volume Left	10	20	0
Volume Right	48	0	10
cSH	317	771	1700
Volume to Capacity	0.18	0.03	0.42
Queue Length 95th (ft)	16	2	0
Control Delay (s)	18.9	0.7	0.0
Lane LOS	C	A	
Approach Delay (s)	18.9	0.7	0.0
Approach LOS	C		

Intersection Summary			
Average Delay		1.1	
Intersection Capacity Utilization		67.1%	ICU Level of Service C
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
8: MLK Way & 53rd Street

Children's Hospital
DC_2035 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	10	6	67	80	10	8	10	10	2214	105	7	1759
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frpb, ped/bikes		0.98			1.00			1.00	0.99		1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.89			0.99			1.00	0.99		1.00	1.00
Flt Protected		0.99			0.96			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1616			1796			1770	5012		1787	5129
Flt Permitted		0.96			0.72			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1568			1355			1770	5012		1787	5129
Peak-hour factor, PHF	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. Flow (vph)	10	6	67	80	10	8	10	10	2214	105	7	1759
RTOR Reduction (vph)	0	55	0	0	4	0	0	0	3	0	0	0
Lane Group Flow (vph)	0	28	0	0	94	0	0	20	2316	0	7	1769
Confl. Peds. (#/hr)	12		6	6		12				48		
Confl. Bikes (#/hr)			6			3				20		
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		17.6			17.6			3.1	68.1		1.8	66.8
Effective Green, g (s)		17.6			17.6			3.1	68.1		1.8	66.8
Actuated g/C Ratio		0.18			0.18			0.03	0.68		0.02	0.67
Clearance Time (s)		5.0			5.0			4.0	3.5		4.0	3.5
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		275			238			54	3413		32	3426
v/s Ratio Prot								0.01	c0.46		0.00	c0.34
v/s Ratio Perm		0.02			c0.07							
v/c Ratio		0.10			0.39			0.37	0.68		0.22	0.52
Uniform Delay, d1		34.6			36.5			47.5	9.5		48.4	8.4
Progression Factor		1.00			1.01			1.43	0.25		0.75	0.49
Incremental Delay, d2		0.2			1.1			2.4	0.6		1.7	0.3
Delay (s)		34.7			38.1			70.2	3.0		38.1	4.4
Level of Service		C			D			E	A		D	A
Approach Delay (s)		34.7			38.1				3.6			4.6
Approach LOS		C			D				A			A

Intersection Summary			
HCM 2000 Control Delay	5.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	10
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	10
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	21
Confl. Bikes (#/hr)	24
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	70	20	0	0	20	10	0	0	0	10	0	40
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	70	20	0	0	20	10	0	0	0	10	0	40
Pedestrians		38			15			6			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	104	93	64	71	113	21	78			15		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	104	93	64	71	113	21	78			15		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	91	97	100	100	97	99	100			99		
cM capacity (veh/h)	792	761	969	857	742	1044	1485			1596		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	90	30	0	50
Volume Left	70	0	0	10
Volume Right	0	10	0	40
cSH	785	821	1700	1596
Volume to Capacity	0.11	0.04	0.00	0.01
Queue Length 95th (ft)	10	3	0	0
Control Delay (s)	10.2	9.6	0.0	1.5
Lane LOS	B	A		A
Approach Delay (s)	10.2	9.6	0.0	1.5
Approach LOS	B	A		

Intersection Summary				
Average Delay	7.5			
Intersection Capacity Utilization	29.8%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	98	123	110	159	99	282	60	120	1867	106	4	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.91			1.00
Frpb, ped/bikes	1.00	0.95			1.00	0.96		1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00			0.96	1.00		1.00	1.00			1.00
Frt	1.00	0.93			1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00			0.97	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1761	1658			1742	1521		1787	5073			1787
Flt Permitted	0.45	1.00			0.54	1.00		0.95	1.00			0.95
Satd. Flow (perm)	830	1658			973	1521		1787	5073			1787
Peak-hour factor, PHF	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. Flow (vph)	98	123	110	159	99	282	60	120	1867	106	4	220
RTOR Reduction (vph)	0	34	0	0	0	203	0	0	6	0	0	0
Lane Group Flow (vph)	98	199	0	0	258	79	0	180	1967	0	0	224
Confl. Peds. (#/hr)	24		92	92		24				15		
Confl. Bikes (#/hr)			14			6				23		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8						
Actuated Green, G (s)	27.9	27.9			27.9	27.9		13.6	41.1			17.5
Effective Green, g (s)	27.9	27.9			27.9	27.9		13.6	41.1			17.5
Actuated g/C Ratio	0.28	0.28			0.28	0.28		0.14	0.41			0.18
Clearance Time (s)	5.0	5.0			5.0	5.0		4.5	4.5			4.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)	231	462			271	424		243	2085			312
v/s Ratio Prot		0.12						0.10	c0.39			0.13
v/s Ratio Perm	0.12				c0.27	0.05						
v/c Ratio	0.42	0.43			0.95	0.19		0.74	0.94			0.72
Uniform Delay, d1	29.5	29.5			35.4	27.4		41.5	28.3			38.9
Progression Factor	1.00	1.00			0.74	2.04		0.97	1.06			0.57
Incremental Delay, d2	0.5	0.2			38.1	0.1		2.8	3.4			5.8
Delay (s)	29.9	29.8			64.3	56.0		43.1	33.5			28.1
Level of Service	C	C			E	E		D	C			C
Approach Delay (s)		29.8			59.9				34.3			
Approach LOS		C			E				C			

Intersection Summary			
HCM 2000 Control Delay	28.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	114.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: MLK Way & 52nd Street

Children's Hospital
DC_2035 PM Plus Phase 2

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	1678	4
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5133	
Flt Permitted	1.00	
Satd. Flow (perm)	5133	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	1678	4
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1682	0
Confl. Peds. (#/hr)		20
Confl. Bikes (#/hr)		26
Heavy Vehicles (%)	1%	1%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	44.5	
Effective Green, g (s)	44.5	
Actuated g/C Ratio	0.44	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2284	
v/s Ratio Prot	c0.33	
v/s Ratio Perm		
v/c Ratio	0.74	
Uniform Delay, d1	22.9	
Progression Factor	0.32	
Incremental Delay, d2	2.0	
Delay (s)	9.4	
Level of Service	A	
Approach Delay (s)	11.6	
Approach LOS	B	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
11: 52nd Street & Garage

Children's Hospital
DC_2035 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	433	5	2	457	2	12	1	7	0	4	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.93			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.95			0.87	
Flt Protected		1.00			1.00			0.97			1.00	
Satd. Flow (prot)		1855			1897			1403			1640	
Flt Permitted		1.00			1.00			0.92			1.00	
Satd. Flow (perm)		1852			1895			1326			1640	
Peak-hour factor, PHF	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. Flow (vph)	3	433	5	2	457	2	12	1	7	0	4	59
RTOR Reduction (vph)	0	1	0	0	1	0	0	4	0	0	32	0
Lane Group Flow (vph)	0	440	0	0	460	0	0	16	0	0	31	0
Confl. Peds. (#/hr)			89	89		38			312	312		
Confl. Bikes (#/hr)			15			9						2
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	16%	16%	16%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		21.0			21.0			23.0			23.0	
Effective Green, g (s)		21.0			21.0			23.0			23.0	
Actuated g/C Ratio		0.42			0.42			0.46			0.46	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		777			795			609			754	
v/s Ratio Prot											c0.02	
v/s Ratio Perm		0.24			c0.24			0.01				
v/c Ratio		0.57			0.58			0.03			0.04	
Uniform Delay, d1		11.0			11.1			7.4			7.4	
Progression Factor		1.78			1.00			1.00			1.00	
Incremental Delay, d2		2.1			3.1			0.1			0.1	
Delay (s)		21.8			14.2			7.5			7.5	
Level of Service		C			B			A			A	
Approach Delay (s)		21.8			14.2			7.5			7.5	
Approach LOS		C			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.30			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	6.0	
Intersection Capacity Utilization	51.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
12: 52nd Street & Dover Street

Children's Hospital
DC_2035 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	395	46	21	392	4	72	0	50	10	0	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	8	395	46	21	392	4	72	0	50	10	0	14
Pedestrians		56			11			53			23	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		5			1			4			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		312			647							
pX, platoon unblocked	0.86			0.82			0.89	0.89	0.82	0.89	0.89	0.86
vC, conflicting volume	419			494			993	948	482	954	969	473
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	238			267			565	514	252	521	538	301
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	99			98			77	100	92	97	100	98
cM capacity (veh/h)	1112			1016			312	366	593	346	366	595

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	449	417	122	24
Volume Left	8	21	72	10
Volume Right	46	4	50	14
cSH	1112	1016	387	458
Volume to Capacity	0.01	0.02	0.32	0.05
Queue Length 95th (ft)	1	2	33	4
Control Delay (s)	0.2	0.7	18.5	13.3
Lane LOS	A	A	C	B
Approach Delay (s)	0.2	0.7	18.5	13.3
Approach LOS			C	B

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	50.8%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
13: SR-24 NB Off-Ramp & 52nd Street

Children's Hospital
DC_2035 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Volume (veh/h)	0	453	0	0	422	1157	0	1140	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	453	0	0	422	1157	0	1140	0	0
Pedestrians							50			
Lane Width (ft)							12.0			
Walking Speed (ft/s)							4.0			
Percent Blockage							4			
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)		767			192					
pX, platoon unblocked	0.80						0.80		0.80	0.80
vC, conflicting volume	1579			503			2082	276	1788	925
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1215			503			1847	276	1478	394
tC, single (s)	4.1			4.1			6.5	7.0	7.5	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			100			100	0	0	100
cM capacity (veh/h)	454			1014			56	688	0	413

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	226	226	281	526	771	570	570
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	386	771	570	570
cSH	1700	1700	1700	1700	1700	688	688
Volume to Capacity	0.13	0.13	0.17	0.31	0.45	0.83	0.83
Queue Length 95th (ft)	0	0	0	0	0	225	225
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	30.3	30.3
Lane LOS						D	D
Approach Delay (s)	0.0		0.0			30.3	
Approach LOS						D	

Intersection Summary				
Average Delay	10.9			
Intersection Capacity Utilization	59.7%	ICU Level of Service		B
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
14: 52nd Street & Shattuck Ave

Children's Hospital
DC_2035 PM Plus Phase 2

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	50	356	987	200	90	970	180	170	290	100	191	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Lane Util. Factor		1.00	0.91		1.00	0.91		1.00	1.00			1.00
Frpb, ped/bikes		1.00	0.98		1.00	0.99		1.00	0.98			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			0.99
Frt		1.00	0.97		1.00	0.98		1.00	0.96			1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.97
Satd. Flow (prot)		1787	4917		1805	4991		1752	1740			1710
Flt Permitted		0.95	1.00		0.95	1.00		0.33	1.00			0.59
Satd. Flow (perm)		1787	4917		1805	4991		613	1740			1040
Peak-hour factor, PHF	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. Flow (vph)	50	356	987	200	90	970	180	170	290	100	191	170
RTOR Reduction (vph)	0	0	27	0	0	24	0	0	11	0	0	0
Lane Group Flow (vph)	0	406	1160	0	90	1126	0	170	379	0	0	361
Confl. Peds. (#/hr)				21	21		17			33	33	
Confl. Bikes (#/hr)				20			12			45		
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%	0%	3%	3%	3%	7%	7%
Turn Type	Prot	Prot	NA		Prot	NA		pm+pt	NA		Perm	NA
Protected Phases	7	7	4		3	8		5	2			6
Permitted Phases								2			6	
Actuated Green, G (s)		25.0	40.4		8.4	23.8		47.2	47.2			38.2
Effective Green, g (s)		25.0	40.4		8.4	23.8		47.2	47.2			38.2
Actuated g/C Ratio		0.23	0.37		0.08	0.22		0.43	0.43			0.35
Clearance Time (s)		4.0	4.5		4.0	4.5		4.0	5.5			5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0			3.0
Lane Grp Cap (vph)		406	1805		137	1079		314	746			361
v/s Ratio Prot		c0.23	0.24		0.05	c0.23		0.02	c0.22			
v/s Ratio Perm								0.21				c0.35
v/c Ratio		1.00	0.64		0.66	1.04		0.54	0.51			1.00
Uniform Delay, d1		42.5	28.8		49.4	43.1		24.4	22.9			35.9
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Incremental Delay, d2		44.7	1.8		10.8	39.4		1.9	2.5			47.4
Delay (s)		87.2	30.6		60.2	82.5		26.3	25.4			83.3
Level of Service		F	C		E	F		C	C			F
Approach Delay (s)			45.0			80.9			25.7			54.3
Approach LOS			D			F			C			D

Intersection Summary					
HCM 2000 Control Delay	54.8	HCM 2000 Level of Service		D	
HCM 2000 Volume to Capacity ratio	0.99				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		18.0	
Intersection Capacity Utilization	110.8%	ICU Level of Service		H	
Analysis Period (min)	15				

c Critical Lane Group

Movement	SBR
Lane Configurations	
Volume (vph)	389
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.93
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1405
Flt Permitted	1.00
Satd. Flow (perm)	1405
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	389
RTOR Reduction (vph)	253
Lane Group Flow (vph)	136
Confl. Peds. (#/hr)	27
Confl. Bikes (#/hr)	41
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	38.2
Effective Green, g (s)	38.2
Actuated g/C Ratio	0.35
Clearance Time (s)	5.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	487
v/s Ratio Prot	
v/s Ratio Perm	0.10
v/c Ratio	0.28
Uniform Delay, d1	25.9
Progression Factor	1.00
Incremental Delay, d2	1.4
Delay (s)	27.4
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	20	20	210	90	200	30	1196	340	200	831	326
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	12	12
Total Lost time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00		0.95	0.95			0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.94			0.98		1.00	0.91	
Flpb, ped/bikes		1.00		1.00	1.00			1.00		1.00	1.00	
Frt		0.95		1.00	0.90			0.97		1.00	0.96	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1642		1698	1508			3759		1770	3068	
Flt Permitted		0.98		0.95	1.00			0.90		0.95	1.00	
Satd. Flow (perm)		1642		1698	1508			3405		1770	3068	
Peak-hour factor, PHF	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. Flow (vph)	20	20	20	210	90	200	30	1196	340	200	831	326
RTOR Reduction (vph)	0	19	0	0	68	0	0	23	0	0	37	0
Lane Group Flow (vph)	0	41	0	189	243	0	0	1543	0	200	1120	0
Confl. Peds. (#/hr)	51					51	105		33			105
Confl. Bikes (#/hr)			2			15			53			72
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Prot	NA	
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		6.2		19.6	19.6			43.0		13.2	60.7	
Effective Green, g (s)		6.2		19.6	19.6			43.0		13.2	60.7	
Actuated g/C Ratio		0.06		0.20	0.20			0.43		0.13	0.61	
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		101		332	295			1464		233	1862	
v/s Ratio Prot		c0.03		0.11	c0.16					c0.11	0.37	
v/s Ratio Perm								c0.45				
v/c Ratio		0.41		0.57	0.83			1.05		0.86	0.60	
Uniform Delay, d1		45.1		36.4	38.6			28.5		42.5	12.2	
Progression Factor		1.80		1.00	1.00			0.50		1.00	1.00	
Incremental Delay, d2		0.8		2.2	16.9			30.6		25.4	1.4	
Delay (s)		82.0		38.6	55.5			44.7		67.9	13.6	
Level of Service		F		D	E			D		E	B	
Approach Delay (s)		82.0			49.1			44.7			21.6	
Approach LOS		F			D			D			C	

Intersection Summary					
HCM 2000 Control Delay	37.0	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.92				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0		
Intersection Capacity Utilization	114.0%	ICU Level of Service	H		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
16: Telegraph Ave & 51St Street

Children's Hospital
DC_2035 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	346	754	118	80	581	240	123	980	190	310	681	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.97		1.00	0.97		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.96		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	3374		1787	3307		1719	3270		1752	3362	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3400	3374		1787	3307		1719	3270		1752	3362	
Peak-hour factor, PHF	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. Flow (vph)	346	754	118	80	581	240	123	980	190	310	681	70
RTOR Reduction (vph)	0	12	0	0	44	0	0	15	0	0	8	0
Lane Group Flow (vph)	346	860	0	80	777	0	123	1155	0	310	743	0
Confl. Peds. (#/hr)			78			57			86			138
Confl. Bikes (#/hr)			12			23			51			81
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.9	29.4		8.3	23.3		8.1	32.8		13.0	38.7	
Effective Green, g (s)	14.9	29.4		8.3	23.3		8.1	32.8		13.0	38.7	
Actuated g/C Ratio	0.15	0.29		0.08	0.23		0.08	0.33		0.13	0.39	
Clearance Time (s)	4.0	4.0		4.0	3.5		4.0	4.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	506	991		148	770		139	1072		227	1301	
v/s Ratio Prot	c0.10	c0.25		0.04	c0.23		0.07	c0.35		c0.18	0.22	
v/s Ratio Perm												
v/c Ratio	0.68	0.87		0.54	1.01		0.88	1.08		1.37	0.57	
Uniform Delay, d1	40.3	33.5		44.0	38.4		45.5	33.6		43.5	24.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.14	0.72	
Incremental Delay, d2	3.8	10.2		4.0	34.5		43.7	50.7		186.0	1.5	
Delay (s)	44.1	43.6		48.0	72.9		89.1	84.3		235.6	18.8	
Level of Service	D	D		D	E		F	F		F	B	
Approach Delay (s)		43.8			70.7			84.8			82.1	
Approach LOS		D			E			F			F	

Intersection Summary				
HCM 2000 Control Delay	70.1	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.04			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	99.8%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
17: SB SR-24 On-Ramp & MLK Way & NB SR-24 Off-Ramp

Children's Hospital
DC_2035 PM Plus Phase 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	341	0	0	0	0	1792	0	0	0	0	1784	253
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					4.0					4.0	4.0
Lane Util. Factor	0.97					1.00					0.95	0.88
Frpb, ped/bikes	1.00					1.00					1.00	1.00
Flpb, ped/bikes	1.00					1.00					1.00	1.00
Frt	1.00					0.86					1.00	0.85
Flt Protected	0.95					1.00					1.00	1.00
Satd. Flow (prot)	3273					1627					3574	2814
Flt Permitted	0.95					1.00					1.00	1.00
Satd. Flow (perm)	3273					1627					3574	2814
Peak-hour factor, PHF	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. Flow (vph)	341	0	0	0	0	1792	0	0	0	0	1784	253
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	341	0	0	0	0	1792	0	0	0	0	1784	253
Confl. Peds. (#/hr)				3								
Confl. Bikes (#/hr)									14			
Heavy Vehicles (%)	7%	7%	2%	2%	1%	1%	2%	2%	2%	2%	1%	1%
Turn Type	Prot					Free					NA	custom
Protected Phases	2										6	Free
Permitted Phases						Free						
Actuated Green, G (s)	13.0					50.0					29.0	50.0
Effective Green, g (s)	13.0					50.0					29.0	50.0
Actuated g/C Ratio	0.26					1.00					0.58	1.00
Clearance Time (s)	4.0										4.0	
Lane Grp Cap (vph)	850					1627					2072	2814
v/s Ratio Prot	0.10										0.50	0.09
v/s Ratio Perm						c1.10						
v/c Ratio	0.40					1.10					0.86	0.09
Uniform Delay, d1	15.3					25.0					8.8	0.0
Progression Factor	1.00					1.00					2.76	1.00
Incremental Delay, d2	1.4					55.5					3.5	0.0
Delay (s)	16.7					80.5					27.8	0.0
Level of Service	B					F					C	A
Approach Delay (s)		16.7			80.5			0.0			24.4	
Approach LOS		B			F			A			C	

Intersection Summary				
HCM 2000 Control Delay	47.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.31			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	65.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	161	10	100	143	0	60	0	150	10	70	10
Peak Hour 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
Hourly flow rate (vph)	0	161	10	100	143	0	60	0	150	10	70	10

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	171	243	60	150	90
Volume Left (vph)	0	100	60	0	10
Volume Right (vph)	10	0	0	150	10
Hadj (s)	-0.02	0.12	0.50	-0.70	-0.01
Departure Headway (s)	5.0	5.0	6.2	5.0	5.4
Degree Utilization, x	0.24	0.34	0.10	0.21	0.13
Capacity (veh/h)	666	675	545	668	604
Control Delay (s)	9.5	10.6	8.7	8.1	9.2
Approach Delay (s)	9.5	10.6	8.3		9.2
Approach LOS	A	B	A		A

Intersection Summary					
Delay			9.5		
Level of Service			A		
Intersection Capacity Utilization			46.2%	ICU Level of Service	A
Analysis Period (min)			15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	151	10	20	133	50	10	10	10	20	10	10
Peak Hour 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
Hourly flow rate (vph)	10	151	10	20	133	50	10	10	10	20	10	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	171	203	30	40
Volume Left (vph)	10	20	10	20
Volume Right (vph)	10	50	10	10
Hadj (s)	-0.01	-0.13	-0.13	-0.05
Departure Headway (s)	4.3	4.1	4.6	4.7
Degree Utilization, x	0.20	0.23	0.04	0.05
Capacity (veh/h)	821	853	712	699
Control Delay (s)	8.4	8.4	7.8	8.0
Approach Delay (s)	8.4	8.4	7.8	8.0
Approach LOS	A	A	A	A

Intersection Summary					
Delay			8.3		
Level of Service			A		
Intersection Capacity Utilization			28.7%	ICU Level of Service	A
Analysis Period (min)			15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	390	10	20	451	40	10	20	40	40	10	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	20	390	10	20	451	40	10	20	40	40	10	20
Pedestrians		8						11			5	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		1						1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					721							
pX, platoon unblocked												
vC, conflicting volume	496			411			990	982	406	1001	967	484
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	496			411			990	982	406	1001	967	484
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			95	92	94	79	96	97
cM capacity (veh/h)	1069			1148			201	239	643	187	242	577

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	420	511	70	70
Volume Left	20	20	10	40
Volume Right	10	40	40	20
cSH	1069	1148	358	241
Volume to Capacity	0.02	0.02	0.20	0.29
Queue Length 95th (ft)	1	1	18	29
Control Delay (s)	0.6	0.5	17.5	25.9
Lane LOS	A	A	C	D
Approach Delay (s)	0.6	0.5	17.5	25.9
Approach LOS			C	D

Intersection Summary				
Average Delay	3.3			
Intersection Capacity Utilization	51.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	123	2217	34	0	1916
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	123	2217	34	0	1916
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			154			137
pX, platoon unblocked	0.71	0.63			0.63	
vC, conflicting volume	2873	756			2251	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	554	0			905	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	82			100	
cM capacity (veh/h)	330	678			468	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	123	887	887	477	639	639	639
Volume Left	0	0	0	0	0	0	0
Volume Right	123	0	0	34	0	0	0
cSH	678	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.18	0.52	0.52	0.28	0.38	0.38	0.38
Queue Length 95th (ft)	16	0	0	0	0	0	0
Control Delay (s)	11.5	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	11.5	0.0			0.0		
Approach LOS	B						

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	57.9%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	2133	0	0	2007
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	2133	0	0	2007
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			424			204
pX, platoon unblocked	0.73					
vC, conflicting volume	2802	711			2133	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2169	711			2133	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	29	375			251	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	0	853	853	427	669	669	669
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.50	0.50	0.25	0.39	0.39	0.39
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	0.0	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	44.5%	ICU Level of Service		A
Analysis Period (min)	15			