

# Appendix B

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## Intersection Level of Service Calculations

Notes: The following calculations include "Existing Conditions," "Preferred Plan," and "Preferred Plan with Roundabouts"  
"Preferred Plan" = Council Approved Plan Components  
"Preferred Plan with Roundabouts" = Council Approved Plan Components plus the Deferred Plan Components



HCM Signalized Intersection Capacity Analysis  
 1. Bidwell Mansion/Memorial Way & Esplanade

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations											
Volume (vph)	14	72	30	68	13	179	0	597	45	0	560
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	3.5	3.5	4.0	3.5	4.0	3.5
Lane Util. Factor	1.00	1.00	1.00	0.98	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.99	0.97	0.91	0.99	0.99	1.00	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.99	0.99	0.99	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1773	1623	1623	3494	3494	1515	1515	3539	1515	3539	1515
Flt Permitted	0.94	0.88	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	1675	1440	1440	3494	3494	1515	1515	3539	1515	3539	1515
Peak-hour factor, PHF	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Adj. Flow (vph)	20	101	42	96	18	252	0	841	63	0	789
RTOR Reduction (vph)	0	27	0	64	0	12	0	12	0	0	27
Lane Group Flow (vph)	0	136	0	302	0	892	0	892	0	0	789
Confl. Peds. (#/hr)	28	16	16	16	16	28	19	11	11	11	19
Turn Type	Perm	NA	NA	Perm	NA	NA	NA	NA	NA	NA	Perm
Protected Phases	4			4			4			2	2
Permitted Phases	4			4			4			2	2
Actuated Green, G (s)	16.0	16.0	16.0	16.0	16.0	21.0	21.0	21.0	21.0	21.0	21.0
Effective Green, g (s)	16.0	16.0	16.0	16.0	16.0	21.5	21.5	21.5	21.5	21.0	21.0
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36	0.48	0.48	0.48	0.48	0.48	0.47
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	595			512		1669		1669		1690	707
v/s Ratio Prot						c0.26		c0.26		0.22	0.22
v/s Ratio Perm	0.08	0.23	0.08	0.21	0.08	0.53	0.53	0.53	0.53	0.47	0.03
Uniform Delay, d1	10.2	11.8	11.8	8.2	11.8	8.2	8.2	8.2	8.2	7.9	6.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.49	0.18
Incremental Delay, d2	0.9	4.9	4.9	1.2	4.9	1.2	1.2	1.2	1.2	0.7	0.1
Delay (s)	11.1	16.8	16.8	9.5	16.8	9.5	9.5	9.5	9.5	4.6	1.2
Level of Service	B	B	B	B	B	A	A	A	A	A	A
Approach Delay (s)	11.1	16.8	16.8	9.5	16.8	9.5	9.5	9.5	9.5	4.4	4.4
Approach LOS	B	B	B	B	B	A	A	A	A	A	A
Intersection Summary											
HCM 2000 Control Delay	8.9										
HCM 2000 Volume to Capacity ratio	0.56										
Actuated Cycle Length (s)	45.0										
Intersection Capacity Utilization	48.6%										
Analysis Period (min)	15										
c Critical Lane Group											

Esplanade Area Complete Street Plan  
 AM Existing Conditions

Synchro 8 Report  
 W-Trans

HCM Signalized Intersection Capacity Analysis  
 1. Bidwell Mansion/Memorial Way & Esplanade

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations											
Volume (vph)	16	42	17	45	7	171	0	931	50	0	605
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	3.5	3.5	4.0	3.5	4.0	3.5
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.99	0.97	0.90	0.99	0.99	1.00	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.99	0.99	0.99	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1762	1601	1601	3506	3506	1497	1497	3539	1497	3539	1497
Flt Permitted	0.93	0.93	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	1648	1512	1512	3506	3506	1497	1497	3539	1497	3539	1497
Peak-hour factor, PHF	0.83	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	17	45	18	48	8	184	0	1001	54	0	651
RTOR Reduction (vph)	0	12	0	40	0	9	0	9	0	0	15
Lane Group Flow (vph)	0	68	0	200	0	1046	0	1046	0	0	651
Confl. Peds. (#/hr)	25	47	47	47	25	28	25	28	11	11	28
Turn Type	Perm	NA	NA	Perm	NA	NA	NA	NA	NA	NA	Perm
Protected Phases	4			4			4			2	2
Permitted Phases	4			4			4			2	2
Actuated Green, G (s)	16.0	16.0	16.0	16.0	16.0	21.0	21.0	21.0	21.0	21.0	21.0
Effective Green, g (s)	16.0	16.0	16.0	16.0	16.0	21.5	21.5	21.5	21.5	21.0	21.0
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36	0.48	0.48	0.48	0.48	0.48	0.47
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	585			537		1675		1675		1690	698
v/s Ratio Prot	0.04	0.12	0.04	0.13	0.04	0.30	0.30	0.30	0.30	0.18	0.01
v/s Ratio Perm	0.12	0.37	0.12	0.37	0.12	0.62	0.62	0.62	0.62	0.39	0.02
Uniform Delay, d1	9.7	10.8	10.8	8.7	10.8	8.7	8.7	8.7	8.7	7.5	6.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.38	0.20
Incremental Delay, d2	0.4	2.0	2.0	1.8	2.0	1.8	1.8	1.8	1.8	0.6	0.0
Delay (s)	10.2	12.7	12.7	10.5	12.7	10.5	10.5	10.5	10.5	3.4	1.3
Level of Service	B	B	B	B	B	A	A	A	A	A	A
Approach Delay (s)	10.2	12.7	12.7	10.5	12.7	10.5	10.5	10.5	10.5	3.3	3.3
Approach LOS	B	B	B	B	B	A	A	A	A	A	A
Intersection Summary											
HCM 2000 Control Delay	8.4										
HCM 2000 Volume to Capacity ratio	0.52										
Actuated Cycle Length (s)	45.0										
Intersection Capacity Utilization	53.5%										
Analysis Period (min)	15										
c Critical Lane Group											

Esplanade Area Complete Street Plan  
 PM Existing Conditions

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HCM Unsignalized Intersection Capacity Analysis  
2: Esplanade & Francis Willard Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	0	0	6	0	0	43	17/4	6/2	21	178	5/1	92
Volume (veh/h)	0	0	6	0	0	43	17/4	6/2	21	178	5/1	92
Sign Control				Stop	Stop	Free	Free	Free				Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	0	0	8	0	0	61	245	862	30	251	804	130
Pedestrians	37			23			2					
Lane Width (ft)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Walking Speed (ft/s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Percent Blockage	3			2			0					0
Right turn flare (veh)												
Median type							None					None
Median storage (veh)												288
Upstream signal (ft)	0.84	0.84	0.81	0.84	0.84	0.93	0.81					0.93
pX, platoon unblocked	2389	2812	506	2304	2862	469	971					915
vC, conflicting volume												
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1915	2416	0	1814	2475	285	495					763
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1					4.1
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2					2.2
p0 queue free %	100	100	99	100	100	91	71					68
cM capacity (veh/h)	17	12	850	23	11	651	836					773
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	8	61	245	575	317	251	536	398				
Volume Left	0	0	245	0	0	251	0	0				
Volume Right	8	61	0	0	30	0	0	130				
cSH	850	651	836	1700	1700	773	1700	1700				
Volume to Capacity	0.01	0.09	0.29	0.34	0.19	0.32	0.32	0.23				
Queue Length 95th (ft)	1	8	31	0	0	35	0	0				
Control Delay (s)	9.3	11.1	11.1	0.0	0.0	11.9	0.0	0.0				
Lane LOS	A	B	B	B	B	B	B	B				
Approach Delay (s)	9.3	11.1	2.4			2.5						
Approach LOS	A	B										
<b>Intersection Summary</b>												
Average Delay	2.7											
Intersection Capacity Utilization	42.8%											
ICU Level of Service	A											
Analysis Period (min)	15											

Esplanade Area Complete Street Plan  
AM Existing Conditions

Synchro 8 Report  
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HCM Unsignalized Intersection Capacity Analysis  
2: Esplanade & Francis Willard Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	0	0	3	0	0	11	58	1052	4	200	640	74
Volume (veh/h)	0	0	3	0	0	11	58	1052	4	200	640	74
Sign Control			Stop	Stop	Stop	Free	Free	Free				Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	0	3	0	0	12	62	1131	4	215	688	80
Pedestrians	46			7			1					
Lane Width (ft)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Walking Speed (ft/s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Percent Blockage	4			1			0					0
Right turn flare (veh)												
Median type							None					None
Median storage (veh)												288
Upstream signal (ft)	0.88	0.88	0.85	0.88	0.88	0.81	0.85					0.81
pX, platoon unblocked	1906	2471	431	2043	2509	575	814					1142
vC, conflicting volume												
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1001	1641	0	1156	1684	0	431					700
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1					4.1
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2					2.2
p0 queue free %	100	100	100	100	100	99	93					70
cM capacity (veh/h)	117	55	887	94	51	871	920					717
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	3	12	62	754	381	215	459	309				
Volume Left	0	0	62	0	0	215	0	0				
Volume Right	3	12	0	0	4	0	0	80				
cSH	887	871	920	1700	1700	717	1700	1700				
Volume to Capacity	0.00	0.01	0.07	0.44	0.22	0.30	0.27	0.18				
Queue Length 95th (ft)	0	1	5	0	0	32	0	0				
Control Delay (s)	9.1	9.2	9.2	0.0	0.0	12.2	0.0	0.0				
Lane LOS	A	A	A	A	A	B	B	B				
Approach Delay (s)	9.1	9.2	0.5			2.7						
Approach LOS	A	A										
<b>Intersection Summary</b>												
Average Delay	1.5											
Intersection Capacity Utilization	54.0%											
ICU Level of Service	A											
Analysis Period (min)	15											

Esplanade Area Complete Street Plan  
PM Existing Conditions

Synchro 8 Report  
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HCM Signalized Intersection Capacity Analysis

3: Esplanade & Lincoln Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations											
Volume (vph)	195	0	93	0	0	25	0	640	25	0	748
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	1.00	0.96	1.00	0.96	1.00	0.95
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.97	0.96	0.86	1.00	0.86	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.97	0.96	0.86	1.00	0.86	1.00	0.85	1.00	0.85	1.00	1.00
Satd. Flow (prot)	1667	1667	1611	3539	1523	1611	3539	1523	1611	3539	1523
Flt Permitted	0.97	0.96	0.86	1.00	0.86	1.00	0.85	1.00	0.85	1.00	1.00
Satd. Flow (perm)	1667	1667	1611	3539	1523	1611	3539	1523	1611	3539	1523
Peak-hour factor, PHF	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Adj. Flow (vph)	275	0	131	0	0	35	0	901	35	0	1054
RTOR Reduction (vph)	0	19	0	0	0	23	0	0	19	0	0
Lane Group Flow (vph)	0	387	0	0	0	12	0	901	16	0	1054
Confl. Peds. (#/hr)	107	107	107	96	13	13	13	96	13	13	96
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	4			4			2			2	
Permitted Phases	4			4			2			2	
Actuated Green, G (s)	16.0			16.0			21.0			21.0	
Effective Green, g (s)	16.0			16.0			21.0			21.0	
Actuated g/C Ratio	0.36			0.36			0.47			0.47	
Clearance Time (s)	4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)	592			572			1651			1651	
v/s Ratio Prot							0.25			0.30	
v/s Ratio Perm	0.23			0.01			0.01			0.01	
v/c Ratio	0.65			0.02			0.55			0.02	
Uniform Delay, d1	12.2			9.4			8.6			6.5	
Progression Factor	1.00			1.00			0.66			0.35	
Incremental Delay, d2	5.6			0.1			1.1			0.1	
Delay (s)	17.7			9.5			6.8			2.3	
Level of Service	B			A			A			A	
Approach Delay (s)	17.7			9.5			6.6			4.9	
Approach LOS	B			A			A			A	
<b>Intersection Summary</b>											
HCM 2000 Control Delay	7.8										
HCM 2000 Volume to Capacity ratio	0.64										
Actuated Cycle Length (s)	45.0										
Intersection Capacity Utilization	49.5%										
Analysis Period (min)	15										
c. Critical Lane Group											

Esplanade Area Complete Street Plan  
AM Existing Conditions

Synchro 8 Report  
W-Trans

HCM Signalized Intersection Capacity Analysis

3: Esplanade & Lincoln Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations											
Volume (vph)	115	0	40	0	0	25	0	1038	25	0	860
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.99	1.00	1.00	1.00	0.96	1.00	0.96	1.00	0.95
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.97	0.96	0.86	1.00	0.86	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.97	0.96	0.86	1.00	0.86	1.00	0.85	1.00	0.85	1.00	1.00
Satd. Flow (prot)	1723	1723	1611	3539	1521	1611	3539	1521	1611	3539	1521
Flt Permitted	0.96	0.96	0.86	1.00	0.86	1.00	0.85	1.00	0.85	1.00	1.00
Satd. Flow (perm)	1723	1723	1611	3539	1521	1611	3539	1521	1611	3539	1521
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	124	0	43	0	0	27	0	1116	27	0	925
RTOR Reduction (vph)	0	28	0	0	0	17	0	0	14	0	0
Lane Group Flow (vph)	0	139	0	0	0	10	0	1116	13	0	927
Confl. Peds. (#/hr)	14	14	14	14	14	14	14	14	14	14	14
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	4			4			2			2	
Permitted Phases	4			4			2			2	
Actuated Green, G (s)	16.0			16.0			21.0			21.0	
Effective Green, g (s)	16.0			16.0			21.0			21.0	
Actuated g/C Ratio	0.36			0.36			0.47			0.47	
Clearance Time (s)	4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)	612			572			1651			1650	
v/s Ratio Prot							0.32			0.26	
v/s Ratio Perm	0.08			0.01			0.01			0.01	
v/c Ratio	0.23			0.02			0.68			0.02	
Uniform Delay, d1	10.2			9.4			9.3			6.5	
Progression Factor	1.00			1.00			0.50			0.19	
Incremental Delay, d2	0.9			0.1			1.8			0.0	
Delay (s)	11.0			9.5			6.5			1.3	
Level of Service	B			A			A			A	
Approach Delay (s)	11.0			9.5			6.4			4.4	
Approach LOS	B			A			A			A	
<b>Intersection Summary</b>											
HCM 2000 Control Delay	5.9										
HCM 2000 Volume to Capacity ratio	0.48										
Actuated Cycle Length (s)	45.0										
Intersection Capacity Utilization	55.4%										
Analysis Period (min)	15										
c. Critical Lane Group											

Esplanade Area Complete Street Plan  
PM Existing Conditions

Synchro 8 Report  
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HCM Unsignalized Intersection Capacity Analysis  
4: Esplanade & W Sacramento Ave

11/18/2015

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	0	118	205	665	630	281
Volume (veh/h)	0	118	205	665	630	281
Sign Control	0	118	205	665	630	281
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	0	166	289	937	887	396
Pedestrians	57			17	1	
Lane Width (ft)	12.0	12.0	12.0	12.0	12.0	12.0
Walking Speed (ft/s)	4.0	4.0	4.0	4.0	4.0	4.0
Percent Blockage	5			1	0	
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)	0.75	0.71	0.71	601	437	
pX, platoon unblocked	2189	716	1340			
VC, conflicting volume						
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	1431	0	673			
IC, single (s)	6.8	6.9	4.1			
IC, 2 stage (s)						
IF (s)	3.5	3.3	2.2			
p0 queue free %	100	77	53			
cM capacity (veh/h)	48	726	621			
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	166	289	468	468	592	692
Volume Left	0	289	0	0	0	0
Volume Right	166	0	0	0	0	396
cSH	726	621	1700	1700	1700	1700
Volume to Capacity	0.23	0.47	0.28	0.28	0.35	0.41
Queue Length 95th (ft)	22	62	0	0	0	0
Control Delay (s)	11.4	15.7	0.0	0.0	0.0	0.0
Lane LOS	B	C				
Approach Delay (s)	11.4	3.7			0.0	
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay	2.4					
Intersection Capacity Utilization	60.0%					
Analysis Period (min)	15					
ICU Level of Service	B					

Esplanade Area Complete Street Plan  
AM Existing Conditions

Synchro 8 Report  
W-Trans

HCM Unsignalized Intersection Capacity Analysis  
4: Esplanade & W Sacramento Ave

11/18/2015

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	0	120	204	974	732	122
Volume (veh/h)	0	120	204	974	732	122
Sign Control	0	120	204	974	732	122
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	129	219	1047	787	131
Pedestrians	20			4		
Lane Width (ft)	12.0	12.0	12.0	12.0	12.0	12.0
Walking Speed (ft/s)	4.0	4.0	4.0	4.0	4.0	4.0
Percent Blockage	2			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)	0.88	0.86	0.86	601	437	
pX, platoon unblocked	1835	483	938			
VC, conflicting volume						
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	975	84	612			
IC, single (s)	6.8	6.9	4.1			
IC, 2 stage (s)						
IF (s)	3.5	3.3	2.2			
p0 queue free %	100	84	73			
cM capacity (veh/h)	157	810	818			
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	129	219	524	524	525	394
Volume Left	0	219	0	0	0	0
Volume Right	129	0	0	0	0	131
cSH	810	818	1700	1700	1700	1700
Volume to Capacity	0.16	0.27	0.31	0.31	0.31	0.23
Queue Length 95th (ft)	14	27	0	0	0	0
Control Delay (s)	10.3	11.0	0.0	0.0	0.0	0.0
Lane LOS	B	B				
Approach Delay (s)	10.3	1.9			0.0	
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay	1.6					
Intersection Capacity Utilization	54.2%					
Analysis Period (min)	15					
ICU Level of Service	A					

Esplanade Area Complete Street Plan  
PM Existing Conditions

Synchro 8 Report  
W-Trans

HCM Signalized Intersection Capacity Analysis  
5: Esplanade & 1st Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations											
Volume (vph)	65	342	39	67	347	62	0	610	70	0	813
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	3.5	3.5	3.5	0.95	1.00	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	1.00	0.95
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98	1.00	0.98	1.00	0.98	1.00	0.85	1.00	0.85	0.99
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1767	1832	1769	1816	1769	1816	3539	1534	3461	3539	3461
Flt Permitted	0.24	1.00	0.24	1.00	0.24	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	451	1832	451	1816	451	1816	3539	1534	3461	3539	3461
Peak-hour factor, PHF	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Adj. Flow (vph)	92	482	55	94	489	87	0	859	99	0	1145
RTOR Reduction (vph)	0	9	0	0	14	0	0	0	52	0	18
Lane Group Flow (vph)	92	528	0	94	562	0	0	859	47	0	1252
Confl. Peds. (#/hr)	6	2	2	2	2	6	40	8	8	8	40
Turn Type	Perm	NA	NA	Perm	NA	NA	NA	Perm	NA	Perm	NA
Protected Phases	4			4			2		2		2
Permitted Phases	4			4			2		2		2
Actuated Green, G (s)	16.0	16.0	16.0	16.0	16.0	16.0	21.0	21.0	21.0	21.0	21.0
Effective Green, g (s)	16.5	16.5	16.5	16.5	16.5	16.5	21.5	21.5	21.5	21.5	21.5
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.37	0.48	0.48	0.48	0.48	0.48
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	165	671	165	665	165	665	1690	732	1653	1690	1653
v/s Ratio Prot	0.20			0.21			0.24		0.03		0.36
v/s Ratio Perm	0.56	0.79	0.57	0.85	0.57	0.85	0.51	0.06	0.76	0.51	0.76
Uniform Delay, d1	11.3	12.7	11.4	13.1	11.4	13.1	8.1	6.3	9.6	8.1	9.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.58	0.21	0.54	0.58	0.54
Incremental Delay, d2	12.9	9.1	13.5	12.5	12.9	9.1	0.9	0.1	2.6	0.9	2.6
Delay (s)	24.3	21.7	24.9	25.6	24.3	25.6	5.6	1.5	7.6	5.6	7.6
Level of Service	C	C	C	C	C	C	A	A	A	A	A
Approach Delay (s)	22.1			25.5			5.2		7.6		7.6
Approach LOS	C			C			A		A		A
<b>Intersection Summary</b>											
HCM 2000 Control Delay	12.9										
HCM 2000 Volume to Capacity ratio	0.79										
Actuated Cycle Length (s)	45.0										
Intersection Capacity Utilization	61.4%										
Analysis Period (min)	15										
c Critical Lane Group	B										

Esplanade Area Complete Street Plan  
AM Existing Conditions

Synchro 8 Report  
W-Trans

HCM Signalized Intersection Capacity Analysis  
5: Esplanade & 1st Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations											
Volume (vph)	75	357	39	93	423	115	0	890	85	0	715
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	3.5	3.5	3.5	0.95	1.00	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	1.00	0.95
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99	1.00	0.95	1.00	0.97	1.00	0.85	1.00	0.85	0.99
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1769	1832	1765	1798	1765	1798	3539	1539	3483	3539	3483
Flt Permitted	0.24	1.00	0.24	1.00	0.24	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	451	1832	451	1798	451	1798	3539	1539	3483	3539	3483
Peak-hour factor, PHF	0.83	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	81	384	42	100	455	124	0	957	91	0	769
RTOR Reduction (vph)	0	9	0	0	22	0	0	0	48	0	15
Lane Group Flow (vph)	81	417	0	100	557	0	0	957	43	0	823
Confl. Peds. (#/hr)	2	6	6	6	6	6	17	6	6	6	17
Turn Type	Perm	NA	NA	Perm	NA	NA	NA	Perm	NA	Perm	NA
Protected Phases	4			4			2		2		2
Permitted Phases	4			4			2		2		2
Actuated Green, G (s)	16.0	16.0	16.0	16.0	16.0	16.0	21.0	21.0	21.0	21.0	21.0
Effective Green, g (s)	16.5	16.5	16.5	16.5	16.5	16.5	21.5	21.5	21.5	21.5	21.5
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.37	0.48	0.48	0.48	0.48	0.48
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	165	671	165	659	165	659	1690	735	1664	1690	1664
v/s Ratio Prot	0.18			0.15			0.27		0.03		0.24
v/s Ratio Perm	0.49	0.62	0.42	0.85	0.42	0.85	0.57	0.06	0.49	0.57	0.49
Uniform Delay, d1	11.0	11.7	11.0	13.1	11.0	13.1	8.4	6.3	8.0	8.4	8.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.22	0.02	0.51	0.22	0.51
Incremental Delay, d2	10.1	4.3	5.5	12.7	10.1	12.7	1.1	0.1	0.9	1.1	0.9
Delay (s)	21.1	16.0	16.2	25.8	21.1	25.8	2.9	0.3	5.1	2.9	5.1
Level of Service	C	B	B	C	C	C	A	A	A	A	A
Approach Delay (s)	16.8			24.3			2.7		5.1		5.1
Approach LOS	B			C			A		A		A
<b>Intersection Summary</b>											
HCM 2000 Control Delay	10.5										
HCM 2000 Volume to Capacity ratio	0.69										
Actuated Cycle Length (s)	45.0										
Intersection Capacity Utilization	68.1%										
Analysis Period (min)	15										
c Critical Lane Group	B										

Esplanade Area Complete Street Plan  
PM Existing Conditions

Synchro 8 Report  
W-Trans

HCM Unsignalized Intersection Capacity Analysis  
6: Esplanade & 2nd Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	3	1	19	1	1	1	18	51	700	5	36	866
Volume (veh/h)												
Sign Control												
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	4	1	27	1	1	25	72	986	7	51	1220	68
Pedestrians	13			10			3				1	
Lane Width (ft)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Walking Speed (ft/s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Percent Blockage	1			1			0			0		0
Right turn flare (veh)												
Median type												
Median storage (veh)												
Upstream signal (ft)	0.78	0.78	0.71	0.78	0.78	0.85	0.71					452
pX, platoon unblocked	2032	2515	660	1885	2545	507	1300					1003
vC, conflicting volume												
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	912	1532	0	723	1571	81	591					661
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1					4.1
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2					2.2
p0 queue free %	97	98	96	99	98	97	90					94
cM capacity (veh/h)	145	74	755	198	70	814	684					782
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	32	28	72	657	336	51	813	474				
Volume Left	4	1	72	0	0	51	0	0				
Volume Right	27	25	0	0	7	0	0	68				
cSH	387	483	684	1700	1700	782	1700	1700				
Volume to Capacity	0.08	0.06	0.10	0.39	0.20	0.06	0.48	0.28				
Queue Length 95th (ft)	7	5	9	0	0	5	0	0				
Control Delay (s)	15.1	12.9	10.9	0.0	0.0	9.9	0.0	0.0				
Lane LOS	C	B	B	A	A	A	A	A				
Approach Delay (s)	15.1	12.9	0.7			0.4						
Approach LOS	C	B	B			A						
Intersection Summary												
Average Delay	0.9											
Intersection Capacity Utilization	43.2%											
ICU Level of Service	A											
Analysis Period (min)	15											

Esplanade Area Complete Street Plan  
AM Existing Conditions

Synchro 8 Report  
W-Trans

HCM Unsignalized Intersection Capacity Analysis  
6: Esplanade & 2nd Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	0	11	4	0	11	48	1010	16	62	750	17
Volume (veh/h)												
Sign Control												
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	0	12	4	0	12	52	1086	17	67	806	18
Pedestrians	14			3			1				2	
Lane Width (ft)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Walking Speed (ft/s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Percent Blockage	1			0			0			0		0
Right turn flare (veh)												
Median type												
Median storage (veh)												
Upstream signal (ft)	0.89	0.89	0.86	0.89	0.89	0.82	0.86					452
pX, platoon unblocked	1623	2172	427	1750	2173	557	839					1106
vC, conflicting volume												
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	738	1356	6	881	1357	14	485					686
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1					4.1
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2					2.2
p0 queue free %	98	100	99	98	100	99	94					91
cM capacity (veh/h)	233	111	912	186	111	865	912					738
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	16	16	52	724	379	67	538	287				
Volume Left	4	4	52	0	0	67	0	0				
Volume Right	12	12	0	0	17	0	0	18				
cSH	514	438	912	1700	1700	738	1700	1700				
Volume to Capacity	0.03	0.04	0.06	0.43	0.22	0.09	0.32	0.17				
Queue Length 95th (ft)	2	3	4	0	0	7	0	0				
Control Delay (s)	12.2	13.5	9.2	0.0	0.0	10.4	0.0	0.0				
Lane LOS	B	B	A	A	A	B	B	B				
Approach Delay (s)	12.2	13.5	0.4			0.8						
Approach LOS	B	B	B			A						
Intersection Summary												
Average Delay	0.8											
Intersection Capacity Utilization	45.8%											
ICU Level of Service	A											
Analysis Period (min)	15											

Esplanade Area Complete Street Plan  
PM Existing Conditions

Synchro 8 Report  
W-Trans



HCM Signalized Intersection Capacity Analysis  
7: Esplanade & 3rd Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	73	64	24	46	56	32	0	719	18	0	882	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5											
Lane Util. Factor	1.00											
Frbp, ped/bikes	1.00											
Frt	1.00											
Flt Protected	0.98											
Satd. Flow (prot)	1766											
Flt Permitted	0.80											
Satd. Flow (perm)	1457											
Peak-hour factor, PHF	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Adj. Flow (vph)	103	90	34	65	79	45	0	1013	25	0	1242	25
RTOR Reduction (vph)	0											
Lane Group Flow (vph)	0		213		0		164		0		1013	
Confl. Peds. (#/hr)	3		2		2		2		3		8	
Turn Type	Perm	NA	NA	Perm	NA	NA	Perm	NA	Perm	NA	NA	NA
Protected Phases	4											
Permitted Phases	4											
Actuated Green, G (s)	16.5											
Effective Green, g (s)	16.5											
Actuated g/C Ratio	0.37											
Clearance Time (s)	3.5											
Lane Grp Cap (vph)	534											
v/s Ratio Prot	0.15											
v/s Ratio Perm	0.29											
w/C Ratio	10.6											
Uniform Delay, d1	1.00											
Progression Factor	2.2											
Incremental Delay, d2	12.8											
Delay (s)	12.8											
Level of Service	B											
Approach Delay (s)	12.8											
Approach LOS	B											
<b>Intersection Summary</b>												
HCM 2000 Control Delay	7.1											
HCM 2000 Volume to Capacity ratio	0.60											
Actuated Cycle Length (s)	45.0											
Intersection Capacity Utilization	45.0%											
Analysis Period (min)	15											
c. Critical Lane Group	A											

Esplanade Area Complete Street Plan  
AM Existing Conditions

Synchro 8 Report  
W-Trans

HCM Signalized Intersection Capacity Analysis  
7: Esplanade & 3rd Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	38	12	23	31	41	0	1005	16	0	790	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5											
Lane Util. Factor	1.00											
Frbp, ped/bikes	1.00											
Frt	1.00											
Flt Protected	0.98											
Satd. Flow (prot)	1784											
Flt Permitted	0.85											
Satd. Flow (perm)	1558											
Peak-hour factor, PHF	0.83	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	54	41	13	25	33	44	0	1081	17	0	849	19
RTOR Reduction (vph)	0											
Lane Group Flow (vph)	0		100		0		74		0		1081	
Confl. Peds. (#/hr)	2		2		2		2		14		3	
Turn Type	Perm	NA	NA	Perm	NA	NA	Perm	NA	Perm	NA	NA	NA
Protected Phases	4											
Permitted Phases	4											
Actuated Green, G (s)	16.5											
Effective Green, g (s)	16.5											
Actuated g/C Ratio	0.37											
Clearance Time (s)	3.5											
Lane Grp Cap (vph)	571											
v/s Ratio Prot	0.06											
v/s Ratio Perm	0.17											
w/C Ratio	9.6											
Uniform Delay, d1	1.00											
Progression Factor	0.7											
Incremental Delay, d2	10.3											
Delay (s)	10.3											
Level of Service	B											
Approach Delay (s)	10.3											
Approach LOS	B											
<b>Intersection Summary</b>												
HCM 2000 Control Delay	5.4											
HCM 2000 Volume to Capacity ratio	0.44											
Actuated Cycle Length (s)	45.0											
Intersection Capacity Utilization	47.8%											
Analysis Period (min)	15											
c. Critical Lane Group	A											

Esplanade Area Complete Street Plan  
PM Existing Conditions

Synchro 8 Report  
W-Trans

HCM Unsignalized Intersection Capacity Analysis  
8: Esplanade & 4th Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	14	7	39	1	1	8	53	767	4	63	860	61
Volume (veh/h)												
Sign Control												
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	20	10	55	1	1	11	75	1080	6	89	1211	86
Pedestrians		8				11		3				
Lane Width (ft)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Walking Speed (ft/s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Percent Blockage	1	1	1	1	1	1	1	1	1	1	1	1
Right turn flare (veh)												
Median type												
Median storage (veh)												
Upstream signal (ft)									429			440
pX, platoon unblocked	0.83	0.83	0.73	0.83	0.83	0.80	0.73			0.80		
vC, conflicting volume	2141	2686	660	2089	2726	554	1305			1097		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	86	1552	0	834	1601	0	683			629		
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	87	86	93	99	98	99	89			88		
cM capacity (veh/h)	155	72	786	147	67	862	658			755		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	85	14	75	720	366	89	808	490				
Volume Left	20	1	75	0	0	89	0	0				
Volume Right	65	11	0	0	6	0	0	86				
cSH	253	323	658	1700	1700	755	1700	1700				
Volume to Capacity	0.33	0.04	0.11	0.42	0.22	0.12	0.48	0.29				
Queue Length 95th (ft)	35	3	10	0	0	10	0	0				
Control Delay (s)	26.2	16.7	11.2	0.0	0.0	10.4	0.0	0.0				
Lane LOS	D	C	B	B	B	B	B	B				
Approach Delay (s)	26.2	16.7	0.7			0.7						
Approach LOS	D	C	C			C						
<b>Intersection Summary</b>												
Average Delay	1.6											
Intersection Capacity Utilization	46.6%											
ICU Level of Service	A											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis  
8: Esplanade & 4th Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	31	5	45	2	3	7	62	1022	12	63	763	42
Volume (veh/h)												
Sign Control												
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	33	5	48	2	3	8	67	1099	13	68	820	45
Pedestrians		6			11		3					
Lane Width (ft)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Walking Speed (ft/s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Percent Blockage	1	1	1	1	1	1	1	1	1	1	1	1
Right turn flare (veh)												
Median type												
Median storage (veh)												
Upstream signal (ft)									429			440
pX, platoon unblocked	0.85	0.85	0.86	0.85	0.85	0.78	0.86			0.78		
vC, conflicting volume	1676	2241	442	1849	2257	567	872			1123		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	704	1371	34	908	1390	0	532			584		
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	85	95	95	99	97	99	92			91		
cM capacity (veh/h)	229	102	883	152	99	835	885			759		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	87	13	67	733	379	68	547	319				
Volume Left	33	2	67	0	0	68	0	0				
Volume Right	48	8	0	0	13	0	0	45				
cSH	344	232	885	1700	1700	759	1700	1700				
Volume to Capacity	0.25	0.06	0.08	0.43	0.22	0.09	0.32	0.19				
Queue Length 95th (ft)	25	4	6	0	0	7	0	0				
Control Delay (s)	19.0	21.5	9.4	0.0	0.0	10.2	0.0	0.0				
Lane LOS	C	C	A	A	A	B	B	B				
Approach Delay (s)	19.0	21.5	0.5			0.7						
Approach LOS	C	C	C			C						
<b>Intersection Summary</b>												
Average Delay	1.5											
Intersection Capacity Utilization	52.1%											
ICU Level of Service	A											
Analysis Period (min)	15											

HCM Signalized Intersection Capacity Analysis  
9: Esplanade & 5th Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations		4		4			4	4			4
Volume (vph)	38	79	18	113	66	104	0	747	44	0	837
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	3.5	3.5	3.5	0.95	1.00	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.98	1.00	0.96	1.00	0.96	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.98	1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00	0.85	0.99
Flt Protected	0.99	0.99	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1797	1804	1546	3539	1521	3511					
Flt Permitted	0.87	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	1582	1404	1546	3539	1521	3511					
Peak-hour factor, PHF	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Adj. Flow (vph)	54	111	25	159	93	146	0	1052	62	0	1179
RTOR Reduction (vph)	0	12	0	0	34	0	0	32	0	7	0
Lane Group Flow (vph)	0	178	0	0	252	112	0	1052	30	0	1228
Confl. Peds. (#/hr)	14	2	2	2	14	4	4	14	14	14	4
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	4			4			2			2	
Permitted Phases	4			4			2			2	
Actuated Green, G (s)	16.0	16.0	16.0	16.0	16.0	16.0	21.0	21.0	21.0	21.0	21.0
Effective Green, g (s)	16.5	16.5	16.5	16.5	16.5	16.5	21.5	21.5	21.5	21.5	21.5
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.37	0.48	0.48	0.48	0.48	0.48
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	580	514	566	1690	726	1677					
v/s Ratio Prot							0.30				c0.35
v/s Ratio Perm	0.11	c0.18	0.07	0.62	0.04	0.73					
w/C Ratio	0.31	0.49	0.20	0.62	0.04	0.73					
Uniform Delay, d1	10.2	11.0	9.7	8.7	6.3	9.4					
Progression Factor	1.00	1.00	1.00	0.70	0.24	0.44					
Incremental Delay, d2	1.4	3.3	0.8	1.5	0.1	1.9					
Delay (s)	11.5	14.3	10.5	7.6	1.6	6.1					
Level of Service	B	B	B	A	A	A					
Approach Delay (s)	11.5	12.9		7.3		6.1					
Approach LOS	B	B		A		A					
<b>Intersection Summary</b>											
HCM 2000 Control Delay	7.8 HCM 2000 Level of Service										
HCM 2000 Volume to Capacity ratio	0.63										
Actuated Cycle Length (s)	45.0 Sum of lost time (s)										
Intersection Capacity Utilization	57.3% ICU Level of Service										
Analysis Period (min)	15										
c Critical Lane Group											

Esplanade Area Complete Street Plan  
AM Existing Conditions

Synchro 8 Report  
W-Trans

HCM Signalized Intersection Capacity Analysis  
9: Esplanade & 5th Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations		4		4			4	4			4
Volume (vph)	39	90	13	76	69	106	0	980	71	0	774
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	3.5	3.5	3.5	0.95	1.00	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.98	1.00	0.96	1.00	0.96	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.99	1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00	0.85	1.00
Flt Protected	0.99	0.99	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1807	1809	1547	3539	1521	3521					
Flt Permitted	0.90	0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	1654	1489	1547	3539	1521	3521					
Peak-hour factor, PHF	0.83	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	42	97	14	82	74	114	0	1054	76	0	832
RTOR Reduction (vph)	0	8	0	0	34	0	0	40	0	5	0
Lane Group Flow (vph)	0	145	0	0	156	80	0	1064	36	0	852
Confl. Peds. (#/hr)	13	10	10	10	13	2	2	12	12	12	2
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	4			4			2			2	
Permitted Phases	4			4			2			2	
Actuated Green, G (s)	16.0	16.0	16.0	16.0	16.0	16.0	21.0	21.0	21.0	21.0	21.0
Effective Green, g (s)	16.5	16.5	16.5	16.5	16.5	16.5	21.5	21.5	21.5	21.5	21.5
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.37	0.48	0.48	0.48	0.48	0.48
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	606	545	567	1690	728	1682					
v/s Ratio Prot							c0.30				0.24
v/s Ratio Perm	0.09	c0.10	0.05	0.62	0.05	0.51					
w/C Ratio	0.24	0.29	0.14	0.62	0.05	0.51					
Uniform Delay, d1	9.9	10.1	9.5	8.7	6.3	8.1					
Progression Factor	1.00	1.00	1.00	0.56	0.24	0.54					
Incremental Delay, d2	0.9	1.3	0.5	1.4	0.1	1.0					
Delay (s)	10.8	11.4	10.0	6.3	1.6	5.4					
Level of Service	B	B	B	A	A	A					
Approach Delay (s)	10.8	10.8		6.0		5.4					
Approach LOS	B	B		A		A					
<b>Intersection Summary</b>											
HCM 2000 Control Delay	6.6 HCM 2000 Level of Service										
HCM 2000 Volume to Capacity ratio	0.48										
Actuated Cycle Length (s)	45.0 Sum of lost time (s)										
Intersection Capacity Utilization	63.8% ICU Level of Service										
Analysis Period (min)	15										
c Critical Lane Group											

Esplanade Area Complete Street Plan  
PM Existing Conditions

Synchro 8 Report  
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HCM Unsignalized Intersection Capacity Analysis  
10: Esplanade & 6th Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (veh/h)	6	7	42	1	1	7	97	782	10	76	834	39
Sign Control				Stop	Stop	Free	Free	Free				
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	8	10	59	1	1	10	137	1101	14	107	1175	55
Pedestrians		14			12			9			6	
Lane Width (ft)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Walking Speed (ft/s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Percent Blockage	1	1	1	1	1	1	1	1	1	1	1	1
Right turn flare (veh)												
Median type												
Median storage (veh)									442			438
Upstream signal (ft)	0.80	0.80	0.70	0.80	0.80	0.80	0.70	0.70	0.80	0.80	0.80	0.80
pX, platoon unblocked	2271	2831	638	2268	2851	576	1244	1244				1127
vC1, conflicting volume												
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	962	1666	0	959	1691	0	479	479			664	
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1	4.1			4.1	
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2			2.2	
p0 queue free %	93	81	92	99	97	99	82	82			85	
cM capacity (veh/h)	120	52	741	99	50	856	743	743			731	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	77	13	137	734	381	107	783	446				
Volume Left	8	1	137	0	0	107	0	0				
Volume Right	69	10	0	0	14	0	0	55				
cSH	228	235	743	1700	1700	731	1700	1700				
Volume to Capacity	0.34	0.05	0.18	0.43	0.22	0.15	0.46	0.26				
Queue Length 95th (ft)	36	4	17	0	0	13	0	0				
Control Delay (s)	28.7	21.2	10.9	0.0	0.0	10.8	0.0	0.0				
Lane LOS	D	C	B	B	B	B	B	B				
Approach Delay (s)	28.7	21.2	1.2			0.9						
Approach LOS	D	C										
<b>Intersection Summary</b>												
Average Delay	1.9											
Intersection Capacity Utilization	46.9%											
ICU Level of Service	A											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis  
10: Esplanade & 6th Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (veh/h)	12	4	56	7	1	20	44	1067	6	56	734	25
Sign Control				Stop	Stop	Free	Free	Free				
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	13	4	60	8	1	22	47	1147	6	60	789	27
Pedestrians		9			8			6			2	
Lane Width (ft)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Walking Speed (ft/s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Percent Blockage	1	1	1	1	1	1	1	1	1	1	1	1
Right turn flare (veh)												
Median type												
Median storage (veh)									442			438
Upstream signal (ft)	0.85	0.85	0.87	0.85	0.85	0.78	0.87	0.87			0.78	
pX, platoon unblocked	1624	2189	423	1837	2199	587	825	825			1162	
vC1, conflicting volume												
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	679	1342	27	928	1354	0	491	491			657	
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1	4.1			4.1	
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2			2.2	
p0 queue free %	95	96	93	95	99	97	95	95			92	
cM capacity (veh/h)	245	110	892	151	108	844	920	920			722	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	77	30	47	765	389	60	526	290				
Volume Left	13	8	47	0	0	60	0	0				
Volume Right	60	22	0	0	0	0	0	27				
cSH	486	353	920	1700	1700	722	1700	1700				
Volume to Capacity	0.16	0.09	0.05	0.45	0.23	0.08	0.31	0.17				
Queue Length 95th (ft)	14	7	4	0	0	7	0	0				
Control Delay (s)	13.8	16.1	9.1	0.0	0.0	10.4	0.0	0.0				
Lane LOS	B	C	A	B	B	B	B	B				
Approach Delay (s)	13.8	16.1	0.4			0.7						
Approach LOS	B	C										
<b>Intersection Summary</b>												
Average Delay	1.2											
Intersection Capacity Utilization	50.1%											
ICU Level of Service	A											
Analysis Period (min)	15											

HCM Signalized Intersection Capacity Analysis  
11: Esplanade & 7th Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations											
Volume (vph)	58	58	30	13	41	40	0	773	21	0	905
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	3.5	3.5	3.5	0.95	1.00	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.99	1.00	0.96	1.00	1.00	0.95
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.99
Frt	0.97	0.98	0.94	0.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	1771	1744	1744	1744	3539	1523	3515	1523	3515	3515	3515
Satd. Flow (prot)	0.85	0.85	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Permitted	1532	1532	1675	1675	3539	1523	3515	1523	3515	3515	3515
Satd. Flow (perm)	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Peak-hour factor, PHF	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Adj. Flow (vph)	82	82	42	18	58	56	0	1089	30	0	1275
RTOR Reduction (vph)	0	18	0	0	30	0	0	0	16	0	6
Lane Group Flow (vph)	0	188	0	0	102	0	0	1089	14	0	1321
Confl. Peds. (#/hr)	4	4	4	4	3	13	13	3	13	13	3
Turn Type	Perm	NA	NA	Perm	NA	NA	Perm	NA	Perm	NA	NA
Protected Phases	4	4	4	4	4	4	4	4	4	4	2
Permitted Phases	4	4	4	4	4	4	4	4	4	4	2
Actuated Green, G (s)	16.0	16.0	16.0	16.0	16.0	16.0	21.0	21.0	21.0	21.0	21.0
Effective Green, g (s)	16.5	16.5	16.5	16.5	16.5	16.5	21.5	21.5	21.5	21.5	21.5
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.37	0.48	0.48	0.48	0.48	0.48
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	561	561	614	614	1690	727	1679	1679	727	1679	1679
v/s Ratio Prot	c0.12	c0.12	0.06	0.06	0.31	0.31	c0.38	c0.38	0.01	0.01	c0.38
v/s Ratio Perm	0.33	0.33	0.17	0.17	0.64	0.64	0.02	0.02	0.79	0.79	0.38
Uniform Delay, d1	10.3	10.3	9.6	9.6	8.9	6.2	9.8	9.8	6.2	9.8	9.8
Progression Factor	1.00	1.00	1.00	1.00	0.45	0.16	0.46	0.46	0.16	0.46	0.46
Incremental Delay, d2	1.6	1.6	0.6	0.6	1.6	0.0	3.1	3.1	0.0	3.1	3.1
Delay (s)	11.9	11.9	10.2	10.2	5.6	1.0	7.7	7.7	1.0	7.7	7.7
Level of Service	B	B	B	B	A	A	A	A	A	A	A
Approach Delay (s)	11.9	11.9	10.2	10.2	5.4	5.4	7.7	7.7	5.4	7.7	7.7
Approach LOS	B	B	B	B	A	A	A	A	A	A	A
<b>Intersection Summary</b>											
HCM 2000 Control Delay	7.2										
HCM 2000 Volume to Capacity ratio	0.59										
Actuated Cycle Length (s)	45.0										
Intersection Capacity Utilization	47.7%										
Analysis Period (min)	15										
c Critical Lane Group											

Esplanade Area Complete Street Plan  
AM Existing Conditions

Synchro 8 Report  
W-Trans

HCM Signalized Intersection Capacity Analysis  
11: Esplanade & 7th Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations											
Volume (vph)	76	50	30	21	26	43	0	1091	10	0	758
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	3.5	3.5	3.5	0.95	1.00	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	0.99	1.00	0.97	1.00	0.97	1.00	0.95
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.99
Frt	0.97	0.98	0.94	0.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	1765	1711	1711	1711	3539	1532	3517	1532	3517	3517	3517
Satd. Flow (prot)	0.84	0.84	0.93	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Permitted	1511	1511	1604	1604	3539	1532	3517	1532	3517	3517	3517
Satd. Flow (perm)	0.83	0.83	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	82	54	32	23	28	46	0	1173	11	0	815
RTOR Reduction (vph)	0	19	0	0	24	0	0	0	6	0	5
Lane Group Flow (vph)	0	149	0	0	73	0	0	1173	5	0	838
Confl. Peds. (#/hr)	1	6	6	6	1	17	9	9	9	9	17
Turn Type	Perm	NA	NA	Perm	NA	NA	Perm	NA	Perm	NA	NA
Protected Phases	4	4	4	4	4	4	4	4	4	4	2
Permitted Phases	4	4	4	4	4	4	4	4	4	4	2
Actuated Green, G (s)	16.0	16.0	16.0	16.0	16.0	16.0	21.0	21.0	21.0	21.0	21.0
Effective Green, g (s)	16.5	16.5	16.5	16.5	16.5	16.5	21.5	21.5	21.5	21.5	21.5
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.37	0.48	0.48	0.48	0.48	0.48
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	554	554	588	588	1690	731	1680	1680	731	1680	1680
v/s Ratio Prot	c0.10	c0.10	0.05	0.05	c0.33	c0.33	0.24	0.24	0.00	0.00	0.24
v/s Ratio Perm	0.27	0.27	0.12	0.12	0.69	0.69	0.01	0.01	0.50	0.50	0.24
Uniform Delay, d1	10.0	10.0	9.5	9.5	9.2	6.2	8.1	8.1	6.2	8.1	8.1
Progression Factor	1.00	1.00	1.00	1.00	0.42	0.05	0.37	0.37	0.05	0.37	0.37
Incremental Delay, d2	1.2	1.2	0.4	0.4	2.0	0.0	1.0	1.0	0.0	1.0	1.0
Delay (s)	11.2	11.2	9.9	9.9	5.8	0.3	3.9	3.9	0.3	3.9	3.9
Level of Service	B	B	B	B	A	A	A	A	A	A	A
Approach Delay (s)	11.2	11.2	9.9	9.9	5.8	5.8	3.9	3.9	5.8	3.9	3.9
Approach LOS	B	B	B	B	A	A	A	A	A	A	A
<b>Intersection Summary</b>											
HCM 2000 Control Delay	5.7										
HCM 2000 Volume to Capacity ratio	0.51										
Actuated Cycle Length (s)	45.0										
Intersection Capacity Utilization	52.3%										
Analysis Period (min)	15										
c Critical Lane Group											

Esplanade Area Complete Street Plan  
PM Existing Conditions

Synchro 8 Report  
W-Trans

HCM Unsignalized Intersection Capacity Analysis  
12: Esplanade & 8th Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	34	6	127	2	1	8	144	718	9	41	813	90
Volume (veh/h)												
Sign Control				Stop	Stop	Free	Free	Free	Free	Free	Free	Free
Grade				0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	48	8	179	3	1	11	203	1011	13	58	1145	127
Pedestrians		5			7			3				
Lane Width (ft)				12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Walking Speed (ft/s)				4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Percent Blockage		0			1			0				0
Right turn flare (veh)												
Median type								None				None
Median storage (veh)									434			439
Upstream signal (ft)												
pX, platoon unblocked	0.83	0.83	0.74	0.83	0.83	0.81	0.74					0.81
vC, conflicting volume	2252	2766	644	2304	2823	519	1277					1031
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1048	1665	0	1111	1733	0	656					554
IC, single (s)		7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1
IC, 2 stage (s)												
IF (s)		3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2
p0 queue free %		55	84	77	96	97	99	70				93
cM capacity (veh/h)		105	51	792	67	47	868	679				810
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	235	15	203	674	350	58	763	508				
Volume Left	48	3	203	0	0	58	0	0				
Volume Right	179	11	0	0	13	0	0	127				
cSH	279	182	679	1700	1700	810	1700	1700				
Volume to Capacity	0.84	0.09	0.30	0.40	0.21	0.07	0.45	0.30				
Queue Length 95th (ft)	177	7	31	0	0	6	0	0				
Control Delay (s)	61.2	26.7	12.5	0.0	0.0	9.8	0.0	0.0				
Lane LOS	F	D	B	A	A	A	A	A				
Approach Delay (s)	61.2	26.7	2.1		0.4							
Approach LOS	F	D	B		A							
Intersection Summary												
Average Delay	6.4											
Intersection Capacity Utilization	57.6%											
Analysis Period (min)	15											
ICU Level of Service	B											

Esplanade Area Complete Street Plan  
AM Existing Conditions

Synchro 8 Report  
W-Trans

HCM Unsignalized Intersection Capacity Analysis  
12: Esplanade & 8th Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	30	7	99	1	1	25	225	967	18	38	684	117
Volume (veh/h)												
Sign Control				Stop	Stop	Free	Free	Free	Free	Free	Free	Free
Grade				0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.83	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	32	8	106	1	1	27	242	1040	19	41	735	128
Pedestrians		12			8			4				
Lane Width (ft)				12.0	12.0	12.0	12.0	12.0				
Walking Speed (ft/s)				4.0	4.0	4.0	4.0	4.0				
Percent Blockage		1			1			0				0
Right turn flare (veh)												
Median type								None				None
Median storage (veh)									434			439
Upstream signal (ft)												
pX, platoon unblocked	0.85	0.85	0.86	0.85	0.85	0.78	0.86					0.78
vC, conflicting volume	1923	2443	447	2105	2496	538	873					1067
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	995	1605	30	1209	1668	0	526					529
IC, single (s)		7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1
IC, 2 stage (s)												
IF (s)		3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2
p0 queue free %		73	87	88	98	98	97	73				95
cM capacity (veh/h)		120	60	881	70	55	842	883				804
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	146	29	242	693	366	41	490	371				
Volume Left	32	1	242	0	0	41	0	0				
Volume Right	106	27	0	0	19	0	0	126				
cSH	284	435	883	1700	1700	804	1700	1700				
Volume to Capacity	0.51	0.07	0.27	0.41	0.22	0.05	0.29	0.22				
Queue Length 95th (ft)	69	5	28	0	0	4	0	0				
Control Delay (s)	30.3	13.9	10.6	0.0	0.0	9.7	0.0	0.0				
Lane LOS	D	B	B	A	A	A	A	A				
Approach Delay (s)	30.3	13.9	2.0		0.4							
Approach LOS	D	B	B		A							
Intersection Summary												
Average Delay	3.3											
Intersection Capacity Utilization	60.4%											
Analysis Period (min)	15											
ICU Level of Service	B											

Esplanade Area Complete Street Plan  
PM Existing Conditions

Synchro 8 Report  
W-Trans

HCM Signalized Intersection Capacity Analysis  
13: Esplanade & 9th Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Volume (vph)	58	117	19	91	44	52	0	682	81	0	838	10	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	3.5	3.5	3.5	3.5	3.5	3.5	0.95	1.00	3.5	3.5	3.5	3.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00	0.97	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	0.99	0.99	0.98	0.98	0.98	0.98	1.00	1.00	0.85	1.00	1.00	1.00	
Flt Protected	1808	1743	1743	3539	1541	3532	1541	3532	1541	3532	1541	3532	
Satd. Flow (prot)	0.86	0.77	0.77	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flt Permitted	1580	1367	1367	3539	1541	3532	1541	3532	1541	3532	1541	3532	
Peak-hour factor, PHF	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	
Adj. Flow (vph)	82	165	27	128	62	73	0	961	114	0	1180	14	
RTOR Reduction (vph)	0	9	0	31	0	0	0	60	0	0	2	0	
Lane Group Flow (vph)	0	265	0	0	232	0	0	961	54	0	1192	0	
Confl. Peds. (#/hr)	3	1	1	1	3	5	5	5	5	5	5	5	
Turn Type	Perm	NA	NA	Perm	NA	NA	Perm	NA	Perm	NA	Perm	NA	
Protected Phases	4	4	4	4	4	4	4	4	4	4	4	4	
Permitted Phases	4	4	4	4	4	4	4	4	4	4	4	4	
Actuated Green, G (s)	16.0	16.0	16.0	16.0	16.0	16.0	21.0	21.0	21.0	21.0	21.0	21.0	
Effective Green, g (s)	16.5	16.5	16.5	16.5	16.5	16.5	21.5	21.5	21.5	21.5	21.5	21.5	
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.37	0.48	0.48	0.48	0.48	0.48	0.48	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	579	1690	736	1687	736	1687	1690	736	1687	736	1687	736	
v/s Ratio Prot	0.17	0.17	0.17	0.17	0.17	0.17	0.27	0.27	0.27	0.27	0.27	0.27	
v/s Ratio Perm	0.46	0.46	0.46	0.46	0.46	0.46	0.57	0.57	0.57	0.57	0.57	0.57	
Uniform Delay, d1	10.8	10.9	10.9	8.4	6.4	6.4	8.4	6.4	6.4	6.4	6.4	6.4	
Progression Factor	1.00	1.00	1.00	0.57	0.21	0.21	0.57	0.21	0.21	0.21	0.21	0.21	
Incremental Delay, d2	2.6	3.1	3.1	1.2	0.2	0.2	1.2	0.2	0.2	0.2	0.2	0.2	
Delay (s)	13.4	13.9	13.9	6.0	1.5	1.5	6.0	1.5	1.5	1.5	1.5	1.5	
Level of Service	B	B	B	A	A	A	A	A	A	A	A	A	
Approach Delay (s)	13.4	13.9	13.9	6.0	1.5	1.5	6.0	1.5	1.5	1.5	1.5	1.5	
Approach LOS	B	B	B	A	A	A	A	A	A	A	A	A	
Intersection Summary													
HCM 2000 Control Delay	9.7											HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60												
Actuated Cycle Length (s)	45.0											Sum of lost time (s)	7.0
Intersection Capacity Utilization	47.7%											ICU Level of Service	A
Analysis Period (min)	15												
c Critical Lane Group													

Esplanade Area Complete Street Plan  
AM Existing Conditions

Synchro 8 Report  
W-Trans

HCM Signalized Intersection Capacity Analysis  
13: Esplanade & 9th Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Volume (vph)	57	80	6	70	66	55	0	943	80	0	763	26	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	3.5	3.5	3.5	3.5	3.5	3.5	0.95	1.00	3.5	3.5	3.5	3.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00	0.97	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	0.99	0.99	0.98	0.98	0.98	0.98	1.00	1.00	0.85	1.00	1.00	1.00	
Flt Protected	1817	1752	1752	3539	1532	3517	1532	3517	1532	3517	1532	3517	
Satd. Flow (prot)	0.84	0.85	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flt Permitted	1550	1525	1525	3539	1532	3517	1532	3517	1532	3517	1532	3517	
Peak-hour factor, PHF	0.83	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	61	86	6	75	71	59	0	1014	86	0	820	28	
RTOR Reduction (vph)	0	3	0	32	0	0	0	45	0	0	5	0	
Lane Group Flow (vph)	0	150	0	0	173	0	0	1014	41	0	843	0	
Confl. Peds. (#/hr)	3	1	1	1	3	5	5	5	5	5	5	5	
Turn Type	Perm	NA	NA	Perm	NA	NA	Perm	NA	Perm	NA	Perm	NA	
Protected Phases	4	4	4	4	4	4	4	4	4	4	4	4	
Permitted Phases	4	4	4	4	4	4	4	4	4	4	4	4	
Actuated Green, G (s)	16.0	16.0	16.0	16.0	16.0	16.0	21.0	21.0	21.0	21.0	21.0	21.0	
Effective Green, g (s)	16.5	16.5	16.5	16.5	16.5	16.5	21.5	21.5	21.5	21.5	21.5	21.5	
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.37	0.48	0.48	0.48	0.48	0.48	0.48	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	568	1690	731	1680	731	1680	1690	731	1680	731	1680	731	
v/s Ratio Prot	0.10	0.10	0.10	0.11	0.11	0.11	0.29	0.29	0.29	0.29	0.29	0.29	
v/s Ratio Perm	0.26	0.26	0.26	0.31	0.31	0.31	0.60	0.60	0.60	0.60	0.60	0.60	
Uniform Delay, d1	10.0	10.2	10.2	8.6	6.3	6.3	8.6	6.3	6.3	6.3	6.3	6.3	
Progression Factor	1.00	1.00	1.00	0.51	0.17	0.17	0.51	0.17	0.17	0.17	0.17	0.17	
Incremental Delay, d2	1.1	1.4	1.4	0.4	0.1	0.1	0.4	0.1	0.1	0.1	0.1	0.1	
Delay (s)	11.1	11.6	11.6	5.7	1.2	1.2	5.7	1.2	1.2	1.2	1.2	1.2	
Level of Service	B	B	B	A	A	A	A	A	A	A	A	A	
Approach Delay (s)	11.1	11.6	11.6	5.7	1.2	1.2	5.7	1.2	1.2	1.2	1.2	1.2	
Approach LOS	B	B	B	A	A	A	A	A	A	A	A	A	
Intersection Summary													
HCM 2000 Control Delay	7.7											HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47												
Actuated Cycle Length (s)	45.0											Sum of lost time (s)	7.0
Intersection Capacity Utilization	46.2%											ICU Level of Service	A
Analysis Period (min)	15												
c Critical Lane Group													

Esplanade Area Complete Street Plan  
PM Existing Conditions

Synchro 8 Report  
W-Trans

HCM Unsignalized Intersection Capacity Analysis  
14: Esplanade & 10th Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	3	1	5	2	0	56	8	779	5	102	841	10
Volume (veh/h)												
Sign Control				Stop	Stop			Free			Free	
Grade	0%											
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	4	1	7	3	0	79	11	1097	7	144	1185	14
Pedestrians	8											
Lane Width (ft)	12.0											
Walking Speed (ft/s)	4.0											
Percent Blockage	1											
Right turn flare (veh)	0											
Median type	None											
Median storage (veh)	None											
Upstream signal (ft)	443											
pX, platoon unblocked	0.79	0.79	0.69	0.79	0.79	0.81	0.69			0.81		
vC, conflicting volume	2138	2619	607	2016	2622	558	1207			1109		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	804	1416	0	649	1421	0	400			661		
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	98	99	99	100	91	99			81		
cM capacity (veh/h)	162	84	743	227	84	872	792			743		
Direction, Lane #	EB 1	WB 1	NB 1	NB 1	NB 3	SB 1	SB 2	SB 3				
Volume Total	13	82	11	731	373	144	790	409				
Volume Left	4	3	11	0	0	144	0	0				
Volume Right	7	79	0	0	7	0	0	14				
cSH	243	794	792	1700	1700	743	1700	1700				
Volume to Capacity	0.05	0.10	0.01	0.43	0.22	0.19	0.46	0.24				
Queue Length 95th (ft)	4	9	1	0	0	18	0	0				
Control Delay (s)	20.7	10.1	9.6	0.0	0.0	11.0	0.0	0.0				
Lane LOS	C	B	A	B	B	B	B	B				
Approach Delay (s)	20.7	10.1	0.1		1.2							
Approach LOS	C	B										
<b>Intersection Summary</b>												
Average Delay	1.1											
Intersection Capacity Utilization	41.4%											
ICU Level of Service	A											
Analysis Period (min)	15											

Esplanade Area Complete Street Plan  
AM Existing Conditions

Synchro 8 Report  
W-Trans

HCM Unsignalized Intersection Capacity Analysis  
14: Esplanade & 10th Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	3	3	9	4	4	1	45	32	1015	8	69	785
Volume (veh/h)												
Sign Control		Stop	Stop	Stop	Stop			Free		Free	Free	
Grade	0%											
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	3	3	10	4	4	1	48	34	1091	9	74	844
Pedestrians	19											
Lane Width (ft)	12.0											
Walking Speed (ft/s)	4.0											
Percent Blockage	2											
Right turn flare (veh)	1											
Median type	None											
Median storage (veh)	None											
Upstream signal (ft)	443											
pX, platoon unblocked	0.89	0.89	0.82	0.89	0.89	0.79	0.82			0.79		
vC, conflicting volume	1680	2193	447	1755	2194	558	873			1108		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	585	1165	0	671	1166	0	400			619		
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	98	99	99	98	99	94			90		
cM capacity (veh/h)	285	145	872	259	145	856	930			756		
Direction, Lane #	EB 1	WB 1	NB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3			
Volume Total	16	54	34	728	372	74	563	291				
Volume Left	3	4	34	0	0	74	0	0				
Volume Right	10	48	0	0	0	0	0	10				
cSH	361	667	930	1700	1700	756	1700	1700				
Volume to Capacity	0.04	0.08	0.04	0.43	0.22	0.10	0.33	0.17				
Queue Length 95th (ft)	3	7	3	0	0	8	0	0				
Control Delay (s)	15.4	10.9	9.0	0.0	0.0	10.3	0.0	0.0				
Lane LOS	C	B	A	B	B	B	B	B				
Approach Delay (s)	15.4	10.9	0.3		0.8							
Approach LOS	C	B										
<b>Intersection Summary</b>												
Average Delay	0.9											
Intersection Capacity Utilization	45.8%											
ICU Level of Service	A											
Analysis Period (min)	15											

Esplanade Area Complete Street Plan  
PM Existing Conditions

Synchro 8 Report  
W-Trans



HCM Signalized Intersection Capacity Analysis  
 15: Esplanade & 11th Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations											
Volume (vph)	185	0	150	0	0	7	76	752	3	0	803
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	10	12	12	10	11	12	12	12	12
Total Lost time (s)	3.5			3.5			3.5			3.5	
Lane Util. Factor	1.00			1.00			0.95			0.95	
Frpb, ped/bikes	0.99			1.00			1.00			1.00	
Flpb, ped/bikes	1.00			1.00			1.00			1.00	
Frt	0.94			0.86			1.00			0.99	
Flt Protected	0.97			1.00			0.95			1.00	
Satd. Flow (prot)	1690			1611			1711			3537	
Flt Permitted	0.82			1.00			0.95			1.00	
Satd. Flow (perm)	1428			1611			1711			3537	
Peak-hour factor, PHF	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Adj. Flow (vph)	261	0	211	0	0	10	107	1059	4	0	1131
RTOR Reduction (vph)	0	58	0	0	6	0	0	0	0	0	11
Lane Group Flow (vph)	0	414	0	0	4	0	107	1063	0	0	1231
Confl. Peds. (#/hr)	6	6	6	6	6	6	6	6	6	6	6
Confl. Bikes (#/hr)	3			3			3			3	
Turn Type	Perm	NA	NA	NA	NA	NA	Prot	NA	NA	NA	NA
Protected Phases	4			8			5			2	
Permitted Phases	4			8			8			2	
Actuated Green, G (s)	20.2			20.2			3.9			28.2	
Effective Green, g (s)	20.7			20.7			4.4			28.7	
Actuated g/C Ratio	0.37			0.37			0.08			0.51	
Clearance Time (s)	4.0			4.0			4.0			4.0	
Vehicle Extension (s)	4.0			2.0			0.5			4.0	
Lane Grp Cap (vph)	524			591			133			1799	
v/s Ratio Prot	0.00			0.00			0.06			0.30	
v/s Ratio Perm	0.29			0.79			0.80			0.59	
v/c Ratio	15.9			11.3			25.6			9.7	
Uniform Delay, d1	1.00			1.00			1.00			1.00	
Progression Factor	8.4			0.0			27.2			1.4	
Incremental Delay, d2	24.3			11.3			52.8			11.2	
Delay (s)	C			B			D			C	
Level of Service	C			B			D			C	
Approach Delay (s)	24.3			11.3			15.0			34.2	
Approach LOS	C			B			B			C	
<b>Intersection Summary</b>											
HCM 2000 Control Delay	24.7			HCM 2000 Level of Service			C			C	
HCM 2000 Volume to Capacity ratio	0.88			Sum of lost time (s)			10.5			10.5	
Actuated Cycle Length (s)	56.4			ICU Level of Service			C			C	
Intersection Capacity Utilization	65.3%			Analysis Period (min)			15			15	
c Critical Lane Group											

Esplanade Area Complete Street Plan  
 AM Existing Conditions

Synchro 8 Report  
 W-Trans

HCM Signalized Intersection Capacity Analysis  
 15: Esplanade & 11th Ave

11/18/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations											
Volume (vph)	121	0	91	1	2	4	153	903	0	0	777
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	10	12	12	10	11	12	12	12	12
Total Lost time (s)	3.5			3.5			3.5			3.5	
Lane Util. Factor	1.00			1.00			1.00			0.95	
Frpb, ped/bikes	0.99			1.00			1.00			1.00	
Flpb, ped/bikes	1.00			1.00			1.00			1.00	
Frt	0.94			0.92			1.00			0.97	
Flt Protected	0.97			0.99			0.95			1.00	
Satd. Flow (prot)	1694			1694			1711			3539	
Flt Permitted	0.82			0.96			0.95			1.00	
Satd. Flow (perm)	1431			1645			1711			3539	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	130	0	98	1	2	4	165	971	0	0	835
RTOR Reduction (vph)	0	67	0	0	3	0	0	0	0	0	26
Lane Group Flow (vph)	0	161	0	0	4	0	165	971	0	0	985
Confl. Peds. (#/hr)	1	2	2	2	2	1	5	5	23	23	5
Confl. Bikes (#/hr)	3			3			3			3	
Turn Type	Perm	NA	NA	NA	NA	NA	Prot	NA	NA	NA	NA
Protected Phases	4			8			5			2	
Permitted Phases	4			8			8			2	
Actuated Green, G (s)	12.1			12.1			5.1			27.4	
Effective Green, g (s)	12.6			12.6			5.6			27.9	
Actuated g/C Ratio	0.27			0.27			0.12			0.59	
Clearance Time (s)	4.0			4.0			4.0			4.0	
Vehicle Extension (s)	4.0			2.0			0.5			4.0	
Lane Grp Cap (vph)	379			436			201			2078	
v/s Ratio Prot	0.11			0.00			0.10			0.27	
v/s Ratio Perm	0.43			0.01			0.82			0.47	
v/c Ratio	14.5			12.9			20.5			5.6	
Uniform Delay, d1	1.00			1.00			1.00			1.00	
Progression Factor	1.0			0.0			21.8			0.8	
Incremental Delay, d2	15.5			12.9			42.3			6.3	
Delay (s)	B			B			D			A	
Level of Service	B			B			D			A	
Approach Delay (s)	15.5			12.9			11.6			15.6	
Approach LOS	B			B			B			B	
<b>Intersection Summary</b>											
HCM 2000 Control Delay	13.6			HCM 2000 Level of Service			B			B	
HCM 2000 Volume to Capacity ratio	0.64			Sum of lost time (s)			10.5			10.5	
Actuated Cycle Length (s)	47.5			ICU Level of Service			C			C	
Intersection Capacity Utilization	64.4%			Analysis Period (min)			15			15	
c Critical Lane Group											

Esplanade Area Complete Street Plan  
 PM Existing Conditions

Synchro 8 Report  
 W-Trans

HCM Signalized Intersection Capacity Analysis  
 1. Bidwell Mansion/Memorial Way & Esplanade

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	14	72	30	68	13	179	0	597	45	0	560	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6											
Lane Util. Factor	1.00											
Frbp. ped/bikes	0.99											
Frbp. ped/bikes	1.00											
Frt	0.97											
Frt Protected	0.99											
Satd. Flow (prot)	1764											
Frt Permitted	0.94											
Satd. Flow (perm)	1670											
Peak-hour factor, PHF	0.71											
Adj. Flow (vph)	101											
RTOR Reduction (vph)	0											
Lane Group Flow (vph)	28											
Confl. Peds. (#/hr)	16											
Confl. Bikes (#/hr)	20											
Turn Type	Perm	NA	NA	Perm	NA	NA	18	28	19	11	11	20
Protected Phases	4											
Permitted Phases	4											
Actuated Green, G (s)	24.5											
Effective Green, g (s)	24.5											
Actuated g/C Ratio	0.29											
Clearance Time (s)	4.6											
Vehicle Extension (s)	3.0											
Lane Grp Cap (vph)	487											
v/s Ratio Prot	0.09											
v/s Ratio Perm	0.30											
Uniform Delay, d1	23.1											
Progression Factor	1.00											
Incremental Delay, d2	0.3											
Delay (s)	23.4											
Level of Service	C											
Approach Delay (s)	23.4											
Approach LOS	C											
<b>Intersection Summary</b>												
HCM 2000 Control Delay	12.4											
HCM 2000 Volume to Capacity ratio	0.54											
Actuated Cycle Length (s)	84.0											
Intersection Capacity Utilization	49.2%											
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 1. Bidwell Mansion/Memorial Way & Esplanade

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	16	42	17	45	7	171	0	931	50	0	605	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6											
Lane Util. Factor	1.00											
Frbp. ped/bikes	0.98											
Frbp. ped/bikes	1.00											
Frt	0.97											
Frt Protected	0.99											
Satd. Flow (prot)	1750											
Frt Permitted	0.91											
Satd. Flow (perm)	1616											
Peak-hour factor, PHF	0.93											
Adj. Flow (vph)	17											
RTOR Reduction (vph)	0											
Lane Group Flow (vph)	25											
Confl. Peds. (#/hr)	47											
Confl. Bikes (#/hr)	20											
Turn Type	Perm	NA	NA	Perm	NA	NA	18	28	11	11	20	
Protected Phases	4											
Permitted Phases	4											
Actuated Green, G (s)	16.5											
Effective Green, g (s)	16.5											
Actuated g/C Ratio	0.21											
Clearance Time (s)	4.6											
Vehicle Extension (s)	3.0											
Lane Grp Cap (vph)	333											
v/s Ratio Prot	0.04											
v/s Ratio Perm	0.20											
Uniform Delay, d1	26.3											
Progression Factor	1.00											
Incremental Delay, d2	0.3											
Delay (s)	26.6											
Level of Service	C											
Approach Delay (s)	26.6											
Approach LOS	C											
<b>Intersection Summary</b>												
HCM 2000 Control Delay	10.2											
HCM 2000 Volume to Capacity ratio	0.48											
Actuated Cycle Length (s)	80.0											
Intersection Capacity Utilization	54.5%											
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis  
2: Esplanade & Francis Willard Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	0	0	6	0	0	43	174	612	21	178	571	92
Volume (veh/h)	0	0	6	0	0	43	174	612	21	178	571	92
Sign Control	0	0	6	0	0	43	174	612	21	178	571	92
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	0	0	8	0	0	61	245	862	30	251	804	130
Pedestrians	37			23					2			
Lane Width (ft)	12.0			12.0					12.0			
Walking Speed (ft/s)	4.0			4.0					4.0			
Percent Blockage	3			2					0			
Right turn flare (veh)												
Median type												
Median storage (veh)												
Upstream signal (ft)	0.89	0.89	0.84	0.89	0.89	0.92	0.84		565		288	
pX platoon unblocked	2389	2812	506	2304	2862	469	971		915		915	
vC conflicting volume												
vC1, stage 1 conf vol												
vC2, stage 2 conf vol	1895	2373	46	1799	2429	244	597		729		729	
vCu, unblocked vol	7.5	6.5	6.9	7.5	6.5	6.9	4.1		4.1		4.1	
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2		2.2		2.2	
p0 queue free %	100	100	99	100	100	91	69		68		68	
cM capacity (veh/h)	19	14	828	24	13	682	798		784		784	

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	8	61	245	575	317	251	536	398
Volume Left	0	0	245	0	0	251	0	0
Volume Right	8	61	0	0	30	0	0	130
cSH	828	682	798	1700	1700	784	1700	1700
Volume to Capacity	0.01	0.09	0.31	0.34	0.19	0.32	0.32	0.23
Queue Length 95th (ft)	1	7	33	0	0	35	0	0
Control Delay (s)	9.4	10.8	11.5	0.0	0.0	11.7	0.0	0.0
Lane LOS	A	B	B			B		
Approach Delay (s)	9.4	10.8	2.5			2.5		
Approach LOS	A	B						

Intersection Summary		
Average Delay	2.7	
Intersection Capacity Utilization	42.8%	ICU Level of Service A
Analysis Period (min)	15	

HCM Unsignalized Intersection Capacity Analysis  
2: Esplanade & Francis Willard Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	0	0	3	0	0	11	58	1052	4	200	640	74
Volume (veh/h)	0	0	3	0	0	11	58	1052	4	200	640	74
Sign Control	0	0	3	0	0	11	58	1052	4	200	640	74
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	0	3	0	0	12	62	1131	4	215	688	80
Pedestrians	46			7					1			
Lane Width (ft)	12.0			12.0					12.0			
Walking Speed (ft/s)	4.0			4.0					4.0			
Percent Blockage	4			1					0			
Right turn flare (veh)												
Median type												
Median storage (veh)												
Upstream signal (ft)	0.93	0.93	0.90	0.93	0.93	0.88	0.90		565		288	
pX platoon unblocked	1906	2471	431	2043	2509	575	814		1142		1142	
vC conflicting volume												
vC1, stage 1 conf vol												
vC2, stage 2 conf vol	1351	1958	152	1498	1999	247	577		892		892	
vCu, unblocked vol	7.5	6.5	6.9	7.5	6.5	6.9	4.1		4.1		4.1	
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2		2.2		2.2	
p0 queue free %	100	100	100	100	100	98	93		68		68	
cM capacity (veh/h)	66	35	751	53	33	659	861		662		662	

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	3	12	62	754	381	215	459	309
Volume Left	0	0	62	0	0	215	0	0
Volume Right	3	12	0	0	4	0	0	80
cSH	751	659	861	1700	1700	662	1700	1700
Volume to Capacity	0.00	0.02	0.07	0.44	0.22	0.32	0.27	0.18
Queue Length 95th (ft)	0	1	6	0	0	35	0	0
Control Delay (s)	9.8	10.6	9.5	0.0	0.0	13.0	0.0	0.0
Lane LOS	A	B	A			B		
Approach Delay (s)	9.8	10.6	0.5			2.9		
Approach LOS	A	B						

Intersection Summary		
Average Delay	1.6	
Intersection Capacity Utilization	54.0%	ICU Level of Service A
Analysis Period (min)	15	

HCM Signalized Intersection Capacity Analysis  
 3. Esplanade & Lincoln Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	195	0	93	0	0	25	0	640	25	0	748	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6		4.6		4.6		4.7		4.7		4.7	
Lane Util. Factor	1.00		1.00		1.00		0.95		0.95		0.95	
Frbp. ped/bikes	1.00		1.00		1.00		1.00		1.00		1.00	
Frbp. ped/bikes	1.00		1.00		1.00		1.00		1.00		1.00	
Frt	0.96		0.96		0.86		0.99		0.99		1.00	
Flt Protected	0.97		0.97		1.00		1.00		1.00		1.00	
Satd. Flow (prot)	1653		1653		1611		3510		3539		3539	
Flt Permitted	0.97		0.97		1.00		1.00		1.00		1.00	
Satd. Flow (perm)	1653		1653		1611		3510		3539		3539	
Peak-hour factor, PHF	0.71		0.71		0.71		0.71		0.71		0.71	
Adj. Flow (vph)	275		131		0		35		901		35	
RTOR Reduction (vph)	0		23		0		24		0		2	
Lane Group Flow (vph)	0		383		0		11		934		0	
Confl. Peds. (#/hr)			107		107		96		13		13	
Confl. Bikes (#/hr)			6		6		34		34		34	
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	4		4		4		2		2		2	
Permitted Phases	4		4		4		2		2		2	
Actuated Green, G (s)	25.3		25.3		25.3		49.4		49.4		49.4	
Effective Green, g (s)	25.3		25.3		25.3		49.4		49.4		49.4	
Actuated g/C Ratio	0.30		0.30		0.30		0.59		0.59		0.59	
Clearance Time (s)	4.6		4.6		4.6		4.7		4.7		4.7	
Vehicle Extension (s)	3.0		3.0		3.0		3.0		3.0		3.0	
Lane Grp Cap (vph)	497		485		485		2064		2081		2081	
v/s Ratio Prot	0.23		0.23		0.01		0.27		0.27		0.27	
v/s Ratio Perm	0.77		0.77		0.02		0.45		0.45		0.51	
v/c Ratio	26.7		26.7		20.6		9.7		10.1		10.1	
Uniform Delay, d1	1.00		1.00		1.00		0.82		0.82		0.48	
Progression Factor	7.2		7.2		0.0		0.7		0.7		0.5	
Incremental Delay, d2	34.0		34.0		20.7		8.6		8.6		5.3	
Delay (s)	C		C		C		A		A		A	
Level of Service	C		C		C		A		A		A	
Approach Delay (s)	34.0		34.0		20.7		8.6		8.6		5.3	
Approach LOS	C		C		C		A		A		A	
Intersection Summary												
HCM 2000 Control Delay												
HCM 2000 Volume to Capacity ratio												
Actuated Cycle Length (s)												
Intersection Capacity Utilization												
Analysis Period (min)												
c Critical Lane Group												

Esplanade Area Complete Street Plan  
 AM Preferred Plan

Synchro 8 Report  
 W-Trans

HCM Signalized Intersection Capacity Analysis  
 3. Esplanade & Lincoln Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	0	40	0	0	25	0	1038	25	0	860	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6		4.6		4.6		4.7		4.7		4.7	
Lane Util. Factor	1.00		1.00		1.00		0.95		0.95		0.95	
Frbp. ped/bikes	1.00		1.00		1.00		1.00		1.00		1.00	
Frbp. ped/bikes	1.00		1.00		1.00		1.00		1.00		1.00	
Frt	0.97		0.97		0.86		1.00		1.00		1.00	
Flt Protected	0.96		0.96		1.00		1.00		1.00		1.00	
Satd. Flow (prot)	1720		1720		1611		3521		3536		3536	
Flt Permitted	0.96		0.96		1.00		1.00		1.00		1.00	
Satd. Flow (perm)	1720		1720		1611		3521		3536		3536	
Peak-hour factor, PHF	0.93		0.93		0.93		0.93		0.93		0.93	
Adj. Flow (vph)	124		43		0		27		1116		27	
RTOR Reduction (vph)	0		19		0		0		1		0	
Lane Group Flow (vph)	0		148		0		6		1142		0	
Confl. Peds. (#/hr)			14		14		55		14		14	
Confl. Bikes (#/hr)			4		4		36		36		36	
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	4		4		4		2		2		2	
Permitted Phases	4		4		4		2		2		2	
Actuated Green, G (s)	17.8		17.8		17.8		52.9		52.9		52.9	
Effective Green, g (s)	17.8		17.8		17.8		52.9		52.9		52.9	
Actuated g/C Ratio	0.22		0.22		0.22		0.66		0.66		0.66	
Clearance Time (s)	4.6		4.6		4.6		4.7		4.7		4.7	
Vehicle Extension (s)	3.0		3.0		3.0		3.0		3.0		3.0	
Lane Grp Cap (vph)	382		382		358		2328		2338		2338	
v/s Ratio Prot	0.09		0.09		0.00		0.32		0.32		0.26	
v/s Ratio Perm	0.39		0.39		0.02		0.49		0.49		0.40	
v/c Ratio	26.5		26.5		24.3		6.8		6.8		6.2	
Uniform Delay, d1	1.00		1.00		1.00		0.70		0.70		0.32	
Progression Factor	1.00		1.00		0.0		0.7		0.7		0.4	
Incremental Delay, d2	27.1		27.1		24.3		5.4		5.4		2.4	
Delay (s)	C		C		C		A		A		A	
Level of Service	C		C		C		A		A		A	
Approach Delay (s)	27.1		27.1		24.3		5.4		5.4		2.4	
Approach LOS	C		C		C		A		A		A	
Intersection Summary												
HCM 2000 Control Delay												
HCM 2000 Volume to Capacity ratio												
Actuated Cycle Length (s)												
Intersection Capacity Utilization												
Analysis Period (min)												
c Critical Lane Group												

Esplanade Area Complete Street Plan  
 PM Preferred Plan

Synchro 8 Report  
 W-Trans

HCM Signalized Intersection Capacity Analysis  
4: Esplanade & W Sacramento Ave

5/23/2016

Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations	W		T	T	T	T		
Volume (vph)	0	118	205	665	630	281		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Total Lost time (s)	4.6	4.7	4.7	4.7	4.7	4.7		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95		
Frpb, ped/bikes	0.96	1.00	1.00	1.00	1.00	1.00		
Fltb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		
Frt	0.86	1.00	1.00	1.00	0.95	0.95		
Flt Protected	1.00	0.95	1.00	1.00	1.00	1.00		
Satd. Flow (prot)	1548	1770	1770	3539	3194	3194		
Flt Permitted	1.00	0.95	1.00	1.00	1.00	1.00		
Satd. Flow (perm)	1548	1770	1770	3539	3194	3194		
Peak-hour factor, PHF	0.71	0.71	0.71	0.71	0.71	0.71		
Adj. Flow (vph)	0	166	289	937	887	396		
RTOR Reduction (vph)	133	0	0	0	52	0		
Lane Group Flow (vph)	33	0	289	937	1231	0		
Confl. Peds. (#/hr)	1	17	57			57		
Confl. Bikes (#/hr)		9				48		
Turn Type	Prot	Prot	Prot	MA	NA	NA		
Protected Phases	4		5	2	6			
Permitted Phases								
Actuated Green, G (s)	16.6	17.8	58.1	35.6				
Effective Green, g (s)	16.6	17.8	58.1	35.6				
Actuated g/C Ratio	0.20	0.21	0.69	0.42				
Clearance Time (s)	4.6	4.7	4.7	4.7				
Vehicle Extension (s)	3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)	305	375	2447	1353				
v/s Ratio Prot	c0.02	c0.16	0.26	c0.39				
v/s Ratio Perm								
v/c Ratio	0.11	0.77	0.38	0.91				
Uniform Delay, d1	27.6	31.2	5.4	22.7				
Progression Factor	1.00	0.90	1.56	0.50				
Incremental Delay, d2	0.2	8.6	0.4	7.8				
Delay (s)	27.8	36.5	8.9	19.1				
Level of Service	C	D	A	B				
Approach Delay (s)	27.8		15.4	19.1				
Approach LOS	C		B	B				
<b>Intersection Summary</b>								
HCM 2000 Control Delay						17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio						0.68		
Actuated Cycle Length (s)						84.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization						64.5%	ICU Level of Service	C
Analysis Period (min)						15		
c Critical Lane Group								

HCM Signalized Intersection Capacity Analysis  
4: Esplanade & W Sacramento Ave

5/23/2016

Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations	W		T	T	T	T		
Volume (vph)	0	120	204	974	732	122		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Total Lost time (s)	4.6	4.7	4.7	4.7	4.7	4.7		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95		
Frpb, ped/bikes	0.93	1.00	1.00	1.00	1.00	1.00		
Fltb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		
Frt	0.86	1.00	1.00	1.00	0.98	0.98		
Flt Protected	1.00	0.95	1.00	1.00	1.00	1.00		
Satd. Flow (prot)	1494	1770	1770	3539	3425	3425		
Flt Permitted	1.00	0.95	1.00	1.00	1.00	1.00		
Satd. Flow (perm)	1494	1770	1770	3539	3425	3425		
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93		
Adj. Flow (vph)	0	129	219	1047	787	131		
RTOR Reduction (vph)	104	0	0	0	13	0		
Lane Group Flow (vph)	25	0	219	1047	905	0		
Confl. Peds. (#/hr)	4	20				20		
Confl. Bikes (#/hr)		50				23		
Turn Type	Prot	Prot	Prot	MA	NA	NA		
Protected Phases	4		5	2	6			
Permitted Phases								
Actuated Green, G (s)	15.5	15.3	55.2	35.2				
Effective Green, g (s)	15.5	15.3	55.2	35.2				
Actuated g/C Ratio	0.19	0.19	0.69	0.44				
Clearance Time (s)	4.6	4.7	4.7	4.7				
Vehicle Extension (s)	3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)	289	338	2441	1507				
v/s Ratio Prot	c0.02	c0.12	0.30	c0.26				
v/s Ratio Perm								
v/c Ratio	0.09	0.65	0.43	0.60				
Uniform Delay, d1	26.4	29.9	5.5	17.0				
Progression Factor	1.00	0.79	0.33	1.04				
Incremental Delay, d2	0.1	3.8	0.5	1.5				
Delay (s)	26.6	27.5	2.3	19.3				
Level of Service	C	C	A	B				
Approach Delay (s)	26.6		6.7	19.3				
Approach LOS	C		A	B				
<b>Intersection Summary</b>								
HCM 2000 Control Delay						12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio						0.49		
Actuated Cycle Length (s)						80.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization						56.7%	ICU Level of Service	B
Analysis Period (min)						15		
c Critical Lane Group								

HCM Signalized Intersection Capacity Analysis  
5: Esplanade & 1st Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR																				
Lane Configurations	5	5	5	5	5	5	5	5	5	5	5	5																				
Volume (vph)	65	342	39	67	62	0	610	70	0	813	89	89																				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900																				
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6	4.2	4.2	4.2	4.2	4.2	4.2	4.2																				
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.99	0.95	0.95																				
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00																				
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98	0.98	0.99	0.99	0.99																				
Flt	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00																				
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00																				
Satd. Flow (prot)	1767	1831	1768	1816	1768	3470	3442	3442	3442	3442	3442	3442																				
Flt Permitted	0.18	1.00	0.22	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00																				
Satd. Flow (perm)	327	1831	402	1816	402	3470	3442	3442	3442	3442	3442	3442																				
Peak-hour factor, PHF	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71																				
Adj. Flow (vph)	92	482	55	94	489	87	859	99	0	1145	125	125																				
RTOR Reduction (vph)	0	5	0	8	0	0	10	0	0	9	0	0																				
Lane Group Flow (vph)	92	532	0	94	568	0	948	0	0	1261	0	0																				
Confl. Peds. (#/hr)	6	2	2	2	2	6	40	8	8	8	43	43																				
Confl. Bikes (#/hr)	Perm	NA	2	Perm	NA	2	NA	4	NA	NA	NA	NA																				
Turn Type	Protected Phases	4	4	4	4	4	4	4	2	2	2	2																				
Permitted Phases	Actuated Green, G (s)	31.9	31.9	31.9	31.9	42.3	42.3	42.3	42.3	42.3	42.3	42.3																				
Effective Green, G (s)	32.4	32.4	32.4	32.4	42.8	42.8	42.8	42.8	42.8	42.8	42.8	42.8																				
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51																				
Clearance Time (s)	5.1	5.1	5.1	5.1	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7																				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0																				
Lane Grp Cap (vph)	126	706	0.29	155	700	1768	1753	1753	1753	1753	1753	1753																				
v/s Ratio Prot	0.28	0.73	0.75	0.61	0.81	0.54	0.54	0.54	0.54	0.72	0.72	0.72																				
v/s Ratio Perm	22.1	22.3	20.7	23.1	13.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9																				
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	0.43	0.50	0.50	0.50	0.50	0.50	0.50																				
Progression Factor	19.4	4.6	6.6	7.1	1.1	2.3	2.3	2.3	2.3	2.3	2.3	2.3																				
Incremental Delay, d2	41.5	26.9	27.2	30.2	7.0	10.2	10.2	10.2	10.2	10.2	10.2	10.2																				
Level of Service	D	C	C	C	C	A	B	B	B	B	B	B																				
Approach Delay (s)	29.0	29.8	29.8	29.8	7.0	10.2	10.2	10.2	10.2	10.2	10.2	10.2																				
Approach LOS	C	C	C	C	A	B	B	B	B	B	B	B																				
Intersection Summary	<table border="1"> <tr> <td>HCM 2000 Control Delay</td> <td>16.4</td> <td>HCM 2000 Level of Service</td> <td>B</td> </tr> <tr> <td>HCM 2000 Volume to Capacity ratio</td> <td>0.76</td> <td></td> <td></td> </tr> <tr> <td>Actuated Cycle Length (s)</td> <td>84.0</td> <td>Sum of lost time (s)</td> <td>8.8</td> </tr> <tr> <td>Intersection Capacity Utilization</td> <td>62.5%</td> <td>ICU Level of Service</td> <td>B</td> </tr> <tr> <td>Analysis Period (min)</td> <td>15</td> <td></td> <td></td> </tr> </table>												HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B	HCM 2000 Volume to Capacity ratio	0.76			Actuated Cycle Length (s)	84.0	Sum of lost time (s)	8.8	Intersection Capacity Utilization	62.5%	ICU Level of Service	B	Analysis Period (min)	15		
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B																													
HCM 2000 Volume to Capacity ratio	0.76																															
Actuated Cycle Length (s)	84.0	Sum of lost time (s)	8.8																													
Intersection Capacity Utilization	62.5%	ICU Level of Service	B																													
Analysis Period (min)	15																															
c Critical Lane Group																																

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HCM Signalized Intersection Capacity Analysis  
5: Esplanade & 1st Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR																				
Lane Configurations	5	5	5	5	5	5	5	5	5	5	5	5																				
Volume (vph)	75	357	39	93	423	115	55	880	50	45	715	15																				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900																				
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6	4.2	4.2	4.2	4.2	4.2	4.2	4.2																				
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95																				
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00																				
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99	0.99	1.00	1.00	1.00																				
Flt	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00																				
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00																				
Satd. Flow (prot)	1769	1830	1765	1794	3491	3514	3514	3514	3514	3514	3514	3514																				
Flt Permitted	0.17	1.00	0.33	1.00	1.00	0.85	0.85	0.85	0.85	0.82	0.82	0.82																				
Satd. Flow (perm)	320	1830	621	1794	2992	2891	2891	2891	2891	2891	2891	2891																				
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93																				
Adj. Flow (vph)	81	384	42	100	455	124	59	946	54	48	769	16																				
RTOR Reduction (vph)	0	5	0	0	13	0	0	4	0	0	1	0																				
Lane Group Flow (vph)	81	421	0	100	566	0	1055	0	0	832	0	0																				
Confl. Peds. (#/hr)	2	17	6	6	6	2	17	6	6	6	17	17																				
Confl. Bikes (#/hr)	Perm	NA	17	Perm	NA	16	Perm	NA	33	Perm	NA	20																				
Turn Type	Protected Phases	4	4	4	4	4	2	2	2	2	2	2																				
Permitted Phases	Actuated Green, G (s)	30.1	30.1	30.1	30.1	40.1	40.1	40.1	40.1	40.1	40.1	40.1																				
Effective Green, G (s)	30.6	30.6	30.6	30.6	40.6	40.6	40.6	40.6	40.6	40.6	40.6	40.6																				
Actuated g/C Ratio	0.38	0.38	0.38	0.38	0.38	0.51	0.51	0.51	0.51	0.51	0.51	0.51																				
Clearance Time (s)	5.1	5.1	5.1	5.1	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7																				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0																				
Lane Grp Cap (vph)	122	699	0.23	237	686	1518	1467	1467	1467	1467	1467	1467																				
v/s Ratio Prot	0.25	0.66	0.60	0.42	0.83	0.35	0.35	0.35	0.35	0.29	0.29	0.29																				
v/s Ratio Perm	20.4	19.8	18.2	22.3	15.0	13.6	13.6	13.6	13.6	13.6	13.6	13.6																				
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	0.39	0.60	0.60	0.60	0.60	0.60	0.60																				
Progression Factor	12.8	1.5	1.2	8.0	2.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5																				
Incremental Delay, d2	33.2	21.3	19.4	30.3	8.3	9.7	9.7	9.7	9.7	9.7	9.7	9.7																				
Level of Service	C	C	C	B	C	A	A	A	A	A	A	A																				
Approach Delay (s)	23.2	23.2	23.2	28.7	8.3	9.7	9.7	9.7	9.7	9.7	9.7	9.7																				
Approach LOS	C	C	C	C	A	A	A	A	A	A	A	A																				
Intersection Summary	<table border="1"> <tr> <td>HCM 2000 Control Delay</td> <td>15.6</td> <td>HCM 2000 Level of Service</td> <td>B</td> </tr> <tr> <td>HCM 2000 Volume to Capacity ratio</td> <td>0.75</td> <td></td> <td></td> </tr> <tr> <td>Actuated Cycle Length (s)</td> <td>80.0</td> <td>Sum of lost time (s)</td> <td>8.8</td> </tr> <tr> <td>Intersection Capacity Utilization</td> <td>97.2%</td> <td>ICU Level of Service</td> <td>F</td> </tr> <tr> <td>Analysis Period (min)</td> <td>15</td> <td></td> <td></td> </tr> </table>												HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B	HCM 2000 Volume to Capacity ratio	0.75			Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.8	Intersection Capacity Utilization	97.2%	ICU Level of Service	F	Analysis Period (min)	15		
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B																													
HCM 2000 Volume to Capacity ratio	0.75																															
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.8																													
Intersection Capacity Utilization	97.2%	ICU Level of Service	F																													
Analysis Period (min)	15																															
c Critical Lane Group																																

Esplanade Area Complete Street Plan  
PM Preferred Plan

Synchro 8 Report  
W-Trans

HCM Unsignalized Intersection Capacity Analysis  
6: Esplanade & 2nd Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	1	19	1	1	18	51	700	5	36	866	48
Sign Control												
Grade												
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	4	1	27	1	1	25	72	986	7	51	1220	68
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	2032	2515	660	1885	2545	507	1300					
vC1, stage 1 conf vol												
vC2, stage 2 conf vol	1090	1630	121	926	1663	16	909					
vCu, unblocked vol												
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1					
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2					
p0 queue free %	97	98	96	99	98	97	88					
cM capacity (veh/h)	122	73	728	160	70	877	599					
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	32	28	72	657	336	51	813	474				
Volume Left	4	1	72	0	0	51	0	0				
Volume Right	27	25	0	0	7	0	0	68				
cSH	357	486	599	1700	1700	800	1700	1700				
Volume to Capacity	0.09	0.06	0.12	0.39	0.20	0.06	0.48	0.28				
Queue Length 95th (ft)	7	5	10	0	0	5	0	0				
Control Delay (s)	16.1	12.9	11.8	0.0	0.0	9.8	0.0	0.0				
Lane LOS	C	B	B	A	A	A	A	A				
Approach Delay (s)	16.1	12.9	0.8			0.4						
Approach LOS	C	B	B			A						
<b>Intersection Summary</b>												
Average Delay	0.9											
Intersection Capacity Utilization	43.2%											
Analysis Period (min)	15											
	ICU Level of Service A											

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Synchro 8 Report  
W-Trans

HCM Unsignalized Intersection Capacity Analysis  
6: Esplanade & 2nd Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	4	0	11	4	4	0	11	48	1010	16	62	750
Sign Control												
Grade												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	0	12	4	4	0	12	52	1086	17	67	806
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	1623	2172	427	1750	2173	557	839					
vC1, stage 1 conf vol												
vC2, stage 2 conf vol	982	1636	233	1133	1637	0	675					
vCu, unblocked vol												
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1					
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2					
p0 queue free %	97	100	98	96	100	99	94					
cM capacity (veh/h)	146	71	706	114	70	868	838					
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	16	16	52	724	379	67	538	287				
Volume Left	4	4	52	0	0	67	0	0				
Volume Right	12	12	0	0	17	0	18					
cSH	349	314	838	1700	1700	751	1700	1700				
Volume to Capacity	0.05	0.05	0.06	0.43	0.22	0.09	0.32	0.17				
Queue Length 95th (ft)	4	4	5	0	0	7	0	0				
Control Delay (s)	15.8	17.1	9.6	0.0	0.0	10.3	0.0	0.0				
Lane LOS	C	C	C	A	A	B	A	A				
Approach Delay (s)	15.8	17.1	0.4			0.8						
Approach LOS	C	C	C			A						
<b>Intersection Summary</b>												
Average Delay	0.8											
Intersection Capacity Utilization	45.8%											
Analysis Period (min)	15											
	ICU Level of Service A											

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Synchro 8 Report  
W-Trans

HCM Signalized Intersection Capacity Analysis  
7: Esplanade & 3rd Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	73	64	24	46	56	32	0	719	18	0	882	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6											
Lane Util. Factor	1.00											
Frpb, ped/bikes	1.00											
Flpb, ped/bikes	1.00											
Frt	0.98											
Flt Protected	0.98											
Satd. Flow (prot)	1779											
Flt Permitted	0.71											
Satd. Flow (perm)	1300											
Peak-hour factor, PHF	0.71											
Adj. Flow (vph)	103											
RTOR Reduction (vph)	0											
Lane Group Flow (vph)	0											
Confl. Peds. (#/hr)	3											
Confl. Bikes (#/hr)	3											
Turn Type	Perm	NA	NA	Perm	NA	NA	NA	NA	NA	NA	NA	NA
Protected Phases	4											
Permitted Phases	4											
Actuated Green, G (s)	18.5											
Effective Green, g (s)	18.5											
Actuated g/C Ratio	0.22											
Clearance Time (s)	4.6											
Vehicle Extension (s)	3.0											
Lane Grp Cap (vph)	286											
v/s Ratio Prot	c0.17											
v/s Ratio Perm	0.76											
v/c Ratio	30.7											
Uniform Delay, d1	11.3											
Progression Factor	1.00											
Incremental Delay, d2	11.3											
Delay (s)	42.0											
Level of Service	D											
Approach Delay (s)	42.0											
Approach LOS	D											
<b>Intersection Summary</b>												
HCM 2000 Control Delay	10.5											
HCM 2000 Volume to Capacity ratio	0.59											
Actuated Cycle Length (s)	84.0											
Intersection Capacity Utilization	46.3%											
Analysis Period (min)	15											
c Critical Lane Group												

Esplanade Area Complete Street Plan  
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HCM Signalized Intersection Capacity Analysis  
7: Esplanade & 3rd Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	38	12	23	31	41	0	1005	16	0	790	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6											
Lane Util. Factor	1.00											
Frpb, ped/bikes	1.00											
Flpb, ped/bikes	1.00											
Frt	0.98											
Flt Protected	0.98											
Satd. Flow (prot)	1782											
Flt Permitted	0.80											
Satd. Flow (perm)	1462											
Peak-hour factor, PHF	0.93											
Adj. Flow (vph)	54											
RTOR Reduction (vph)	0											
Lane Group Flow (vph)	0											
Confl. Peds. (#/hr)	2											
Confl. Bikes (#/hr)	2											
Turn Type	Perm	NA	NA	Perm	NA	NA	NA	NA	NA	NA	NA	NA
Protected Phases	4											
Permitted Phases	4											
Actuated Green, G (s)	12.3											
Effective Green, g (s)	12.3											
Actuated g/C Ratio	0.15											
Clearance Time (s)	4.6											
Vehicle Extension (s)	3.0											
Lane Grp Cap (vph)	224											
v/s Ratio Prot	c0.07											
v/s Ratio Perm	0.44											
v/c Ratio	30.7											
Uniform Delay, d1	11.0											
Progression Factor	1.00											
Incremental Delay, d2	11.0											
Delay (s)	32.2											
Level of Service	C											
Approach Delay (s)	32.2											
Approach LOS	C											
<b>Intersection Summary</b>												
HCM 2000 Control Delay	6.0											
HCM 2000 Volume to Capacity ratio	0.43											
Actuated Cycle Length (s)	80.0											
Intersection Capacity Utilization	47.2%											
Analysis Period (min)	15											
c Critical Lane Group												

Esplanade Area Complete Street Plan  
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Synchro 8 Report  
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HCM Unsignalized Intersection Capacity Analysis  
8: Esplanade & 4th Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	14	7	39	1	1	8	53	767	4	63	860	61
Sign Control												
Grade												
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	20	10	55	1	1	11	75	1080	6	89	1211	86
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	0.87	0.87	0.80	0.87	0.87	0.87	0.80	0.80		0.87		440
vC conflicting volume	2141	2686	660	2089	2726	554	1305	1305		1097		1097
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1336	1964	84	1277	2011	189	888	888		813		813
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1	4.1		4.1		4.1
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2		2.2		2.2
p0 queue free %	74	76	93	98	96	98	88	88		87		87
cM capacity (veh/h)	75	41	763	65	38	708	605	605		698		698
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	85	14	75	720	366	89	808	490				
Volume Left	20	1	75	0	0	89	0	0				
Volume Right	55	11	0	0	6	0	86	86				
cSH	146	189	605	1700	1700	698	1700	1700				
Volume to Capacity	0.58	0.07	0.12	0.42	0.22	0.13	0.48	0.29				
Queue Length 95th (ft)	74	6	10	0	0	11	0	0				
Control Delay (s)	59.0	25.6	11.8	0.0	0.0	10.9	0.0	0.0				
Lane LOS	F	D	B			B						
Approach Delay (s)	59.0	25.6	0.8			0.7						
Approach LOS	F	D	D			D						
<b>Intersection Summary</b>												
Average Delay	2.7											
Intersection Capacity Utilization	46.6%											
ICU Level of Service	A											
Analysis Period (min)	15											

Esplanade Area Complete Street Plan  
AM Preferred Plan

Synchro 8 Report  
W-Trans

HCM Unsignalized Intersection Capacity Analysis  
8: Esplanade & 4th Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	31	5	45	2	3	7	62	1022	12	63	763	42
Sign Control												
Grade												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	33	5	48	2	3	8	67	1099	13	68	820	45
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	0.92	0.92	0.92	0.92	0.92	0.88	0.92	0.92		0.88		440
vC conflicting volume	1676	2241	442	1849	2257	567	872	872		1123		1123
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1184	1795	223	1371	1812	249	690	690		877		877
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1	4.1		4.1		4.1
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2		2.2		2.2
p0 queue free %	69	91	93	97	94	99	92	92		90		90
cM capacity (veh/h)	108	60	713	72	58	658	826	826		671		671
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	87	13	67	733	379	68	547	319				
Volume Left	33	2	67	0	0	68	0	0				
Volume Right	48	8	0	0	13	0	45	45				
cSH	187	133	826	1700	1700	671	1700	1700				
Volume to Capacity	0.47	0.10	0.08	0.43	0.22	0.10	0.32	0.19				
Queue Length 95th (ft)	56	8	7	0	0	8	0	0				
Control Delay (s)	40.0	34.8	9.7	0.0	0.0	11.0	0.0	0.0				
Lane LOS	E	D	A			B						
Approach Delay (s)	40.0	34.8	0.6			0.8						
Approach LOS	E	D	D			D						
<b>Intersection Summary</b>												
Average Delay	2.4											
Intersection Capacity Utilization	52.1%											
ICU Level of Service	A											
Analysis Period (min)	15											

Esplanade Area Complete Street Plan  
PM Preferred Plan

Synchro 8 Report  
W-Trans

HCM Signalized Intersection Capacity Analysis  
 9: Esplanade & 5th Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	38	79	18	113	66	104	0	747	44	0	837	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2											
Lane Util. Factor	1.00											
Frbp. ped/bikes	1.00											
Frbp. ped/bikes	1.00											
Frt	0.98											
Flt Protected	0.99											
Flt Permitted	0.99											
Satd. Flow (prot)	1793											
Flt Permitted	0.80											
Satd. Flow (perm)	1453											
Peak-hour factor, PHF	0.71											
Adj. Flow (vph)	54											
RTOR Reduction (vph)	0											
Lane Group Flow (vph)	0											
Confl. Peds. (#/hr)	14											
Confl. Bikes (#/hr)	14											
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	4											
Permitted Phases	4											
Actuated Green, G (s)	22.8											
Effective Green, g (s)	23.3											
Actuated g/C Ratio	0.28											
Clearance Time (s)	4.7											
Vehicle Extension (s)	3.0											
Lane Grp Cap (vph)	403											
v/s Ratio Prot	0.13											
v/s Ratio Perm	0.45											
Uniform Delay, d1	25.1											
Progression Factor	1.00											
Incremental Delay, d2	0.8											
Delay (s)	25.9											
Level of Service	C											
Approach Delay (s)	25.9											
Approach LOS	C											
<b>Intersection Summary</b>												
HCM 2000 Control Delay	11.2											
HCM 2000 Volume to Capacity ratio	0.62											
Actuated Cycle Length (s)	84.0											
Intersection Capacity Utilization	53.2%											
Analysis Period (min)	15											
c Critical Lane Group	A											

Esplanade Area Complete Street Plan  
 AM Preferred Plan

Synchro 8 Report  
 W-Trans

HCM Signalized Intersection Capacity Analysis  
 9: Esplanade & 5th Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	39	90	13	76	106	106	0	980	71	0	774	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2											
Lane Util. Factor	1.00											
Frbp. ped/bikes	1.00											
Frbp. ped/bikes	1.00											
Frt	0.99											
Flt Protected	0.99											
Flt Permitted	0.99											
Satd. Flow (prot)	1804											
Flt Permitted	0.88											
Satd. Flow (perm)	1602											
Peak-hour factor, PHF	0.93											
Adj. Flow (vph)	42											
RTOR Reduction (vph)	0											
Lane Group Flow (vph)	0											
Confl. Peds. (#/hr)	13											
Confl. Bikes (#/hr)	13											
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	4											
Permitted Phases	4											
Actuated Green, G (s)	14.9											
Effective Green, g (s)	15.4											
Actuated g/C Ratio	0.19											
Clearance Time (s)	4.7											
Vehicle Extension (s)	3.0											
Lane Grp Cap (vph)	308											
v/s Ratio Prot	0.09											
v/s Ratio Perm	0.48											
Uniform Delay, d1	28.7											
Progression Factor	1.00											
Incremental Delay, d2	1.2											
Delay (s)	29.9											
Level of Service	C											
Approach Delay (s)	29.9											
Approach LOS	C											
<b>Intersection Summary</b>												
HCM 2000 Control Delay	8.9											
HCM 2000 Volume to Capacity ratio	0.49											
Actuated Cycle Length (s)	80.0											
Intersection Capacity Utilization	63.3%											
Analysis Period (min)	15											
c Critical Lane Group	A											

Esplanade Area Complete Street Plan  
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Synchro 8 Report  
 W-Trans

HCM Unsignalized Intersection Capacity Analysis  
10: Esplanade & 6th Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	7	42	1	1	7	97	782	10	76	834	39
Sign Control												
Grade												
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	8	10	59	1	1	10	137	1101	14	107	1175	55
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	2271	2831	638	2268	2851	576	1244					
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol												
IC, single (s)												
IC, 2 stage (s)												
IF (s)												
p0 queue free %												
cM capacity (veh/h)	61	33	713	46	32	751	627					
Direction_Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	77	13	137	734	381	107	783	446				
Volume Left	8	1	137	0	0	107	0	0				
Volume Right	59	10	0	0	14	0	0	55				
cSH	149	144	627	1700	1700	696	1700	1700				
Volume to Capacity	0.52	0.09	0.22	0.43	0.22	0.15	0.46	0.26				
Queue Length 95th (ft)	63	7	21	0	0	14	0	0				
Control Delay (s)	52.7	32.3	12.3	0.0	0.0	11.1	0.0	0.0				
Lane LOS	F	D	B			B						
Approach Delay (s)	52.7	32.3	1.3			0.9						
Approach LOS	F	D	D			D						
<b>Intersection Summary</b>												
Average Delay	2.7											
Intersection Capacity Utilization	46.9%											
ICU Level of Service	A											
Analysis Period (min)	15											

Esplanade Area Complete Street Plan  
AM Preferred Plan

Synchro 8 Report  
W-Trans

HCM Unsignalized Intersection Capacity Analysis  
10: Esplanade & 6th Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	12	4	56	7	1	20	44	1067	6	56	734	25
Sign Control												
Grade												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	13	4	60	8	1	22	47	1147	6	60	789	27
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	1624	2189	423	1837	2199	587	825					
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol												
IC, single (s)												
IC, 2 stage (s)												
IF (s)												
p0 queue free %												
cM capacity (veh/h)	123	66	720	75	65	670	856					
Direction_Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	77	30	47	765	389	60	526	290				
Volume Left	13	8	47	0	0	60	0	0				
Volume Right	60	22	0	0	6	0	0	27				
cSH	305	202	856	1700	1700	656	1700	1700				
Volume to Capacity	0.25	0.15	0.06	0.45	0.23	0.09	0.31	0.17				
Queue Length 95th (ft)	25	13	4	0	0	8	0	0				
Control Delay (s)	20.7	25.9	9.5	0.0	0.0	11.0	0.0	0.0				
Lane LOS	C	D	A			B						
Approach Delay (s)	20.7	25.9	0.4			0.8						
Approach LOS	C	D	D			D						
<b>Intersection Summary</b>												
Average Delay	1.6											
Intersection Capacity Utilization	50.1%											
ICU Level of Service	A											
Analysis Period (min)	15											

Esplanade Area Complete Street Plan  
PM Preferred Plan

Synchro 8 Report  
W-Trans

HCM Signalized Intersection Capacity Analysis  
11: Esplanade & 7th Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	58	58	30	13	41	40	0	773	21	0	905	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1											
Lane Util. Factor	1.00											
Frbp. ped/bikes	1.00											
Frbp. ped/bikes	1.00											
Frt	0.97											
Flt Protected	0.98											
Satd. Flow (prot)	1769											
Flt Permitted	0.78											
Satd. Flow (perm)	1406											
Peak-hour factor, PHF	0.71											
Adj. Flow (vph)	82											
RTOR Reduction (vph)	0											
Lane Group Flow (vph)	0											
Confl. Peds. (#/hr)	4											
Confl. Bikes (#/hr)	4											
Turn Type	Perm	NA	2	Perm	NA	2	NA	NA	NA	NA	NA	NA
Protected Phases	4											
Permitted Phases	4											
Actuated Green, G (s)	16.2											
Effective Green, g (s)	16.7											
Actuated g/C Ratio	0.20											
Clearance Time (s)	4.6											
Vehicle Extension (s)	3.0											
Lane Grp Cap (vph)	279											
v/s Ratio Prot	c0.14											
v/s Ratio Perm	0.69											
v/c Ratio	31.2											
Uniform Delay, d1	1.00											
Progression Factor	6.9											
Incremental Delay, d2	38.2											
Delay (s)	38.2											
Level of Service	D											
Approach Delay (s)	38.2											
Approach LOS	D											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	76	50	30	21	26	43	0	1091	10	0	758	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1											
Lane Util. Factor	1.00											
Frbp. ped/bikes	1.00											
Frbp. ped/bikes	1.00											
Frt	0.97											
Flt Protected	0.98											
Satd. Flow (prot)	1763											
Flt Permitted	0.80											
Satd. Flow (perm)	1453											
Peak-hour factor, PHF	0.93											
Adj. Flow (vph)	82											
RTOR Reduction (vph)	0											
Lane Group Flow (vph)	0											
Confl. Peds. (#/hr)	1											
Confl. Bikes (#/hr)	1											
Turn Type	Perm	NA	5	Perm	NA	2	NA	NA	NA	NA	NA	NA
Protected Phases	4											
Permitted Phases	4											
Actuated Green, G (s)	14.5											
Effective Green, g (s)	15.0											
Actuated g/C Ratio	0.19											
Clearance Time (s)	4.6											
Vehicle Extension (s)	3.0											
Lane Grp Cap (vph)	272											
v/s Ratio Prot	c0.11											
v/s Ratio Perm	0.57											
v/c Ratio	29.5											
Uniform Delay, d1	1.00											
Progression Factor	2.7											
Incremental Delay, d2	32.2											
Delay (s)	32.2											
Level of Service	C											
Approach Delay (s)	32.2											
Approach LOS	C											

Intersection Summary												
HCM 2000 Control Delay	6.4											
HCM 2000 Volume to Capacity ratio	0.49											
Actuated Cycle Length (s)	80.0											
Intersection Capacity Utilization	53.7%											
Analysis Period (min)	15											
c Critical Lane Group	A											

HCM Signalized Intersection Capacity Analysis  
11: Esplanade & 7th Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	76	50	30	21	26	43	0	1091	10	0	758	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1											
Lane Util. Factor	1.00											
Frbp. ped/bikes	1.00											
Frbp. ped/bikes	1.00											
Frt	0.97											
Flt Protected	0.98											
Satd. Flow (prot)	1763											
Flt Permitted	0.80											
Satd. Flow (perm)	1453											
Peak-hour factor, PHF	0.93											
Adj. Flow (vph)	82											
RTOR Reduction (vph)	0											
Lane Group Flow (vph)	0											
Confl. Peds. (#/hr)	1											
Confl. Bikes (#/hr)	1											
Turn Type	Perm	NA	5	Perm	NA	2	NA	NA	NA	NA	NA	NA
Protected Phases	4											
Permitted Phases	4											
Actuated Green, G (s)	14.5											
Effective Green, g (s)	15.0											
Actuated g/C Ratio	0.19											
Clearance Time (s)	4.6											
Vehicle Extension (s)	3.0											
Lane Grp Cap (vph)	272											
v/s Ratio Prot	c0.11											
v/s Ratio Perm	0.57											
v/c Ratio	29.5											
Uniform Delay, d1	1.00											
Progression Factor	2.7											
Incremental Delay, d2	32.2											
Delay (s)	32.2											
Level of Service	C											
Approach Delay (s)	32.2											
Approach LOS	C											

Intersection Summary												
HCM 2000 Control Delay	6.4											
HCM 2000 Volume to Capacity ratio	0.49											
Actuated Cycle Length (s)	80.0											
Intersection Capacity Utilization	53.7%											
Analysis Period (min)	15											
c Critical Lane Group	A											

HCM Unsignalized Intersection Capacity Analysis  
12: Esplanade & 8th Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	34	6	127	2	1	8	144	718	9	41	813	90
Sign Control												
Grade												
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	48	8	179	3	1	11	203	1011	13	58	1145	127
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	0.87	0.87	0.81	0.87	0.87	0.88	0.81		434		439	
vC, conflicting volume	2252	2766	644	2304	2823	519	1277				1081	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1545	2135	99	1605	2201	196	879				775	
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	0	67	76	89	94	98	67				92	
cM capacity (veh/h)	44	26	756	25	24	714	619				736	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	235	15	203	674	350	58	763	508				
Volume Left	48	3	203	0	0	58	0	0				
Volume Right	179	11	0	0	13	0	0	127				
cSH	143	82	619	1700	1700	736	1700	1700				
Volume to Capacity	1.64	0.19	0.33	0.40	0.21	0.08	0.45	0.30				
Queue Length 95th (ft)	418	16	36	0	0	6	0	0				
Control Delay (s)	372.0	59.1	13.6	0.0	0.0	10.3	0.0	0.0				
Lane LOS	F	F	B	B	B	B	B	B				
Approach Delay (s)	372.0	59.1	2.3			0.4						
Approach LOS	F	F	C			C						

Intersection Summary		
Average Delay	32.7	
Intersection Capacity Utilization	57.6%	ICU Level of Service B
Analysis Period (min)	15	

HCM Unsignalized Intersection Capacity Analysis  
12: Esplanade & 8th Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	7	99	1	1	25	225	967	18	38	684	117
Sign Control												
Grade												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	32	8	106	1	1	27	242	1040	19	41	735	126
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	0.92	0.92	0.92	0.92	0.92	0.88	0.92		434		439	
vC, conflicting volume	1923	2443	447	2105	2496	538	873				1067	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1422	1988	215	1620	2046	195	681				798	
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	46	79	85	97	97	96	71				94	
cM capacity (veh/h)	60	36	714	33	33	709	824				715	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	146	29	242	693	366	41	490	371				
Volume Left	32	1	242	0	0	41	0	0				
Volume Right	106	27	0	0	19	0	126					
cSH	164	283	824	1700	1700	715	1700	1700				
Volume to Capacity	0.89	0.10	0.29	0.41	0.22	0.06	0.29	0.22				
Queue Length 95th (ft)	159	8	31	0	0	5	0	0				
Control Delay (s)	99.5	19.2	11.2	0.0	0.0	10.3	0.0	0.0				
Lane LOS	F	F	C	B	B	B	B	B				
Approach Delay (s)	99.5	19.2	2.1			0.5						
Approach LOS	F	F	C			C						

Intersection Summary		
Average Delay	7.7	
Intersection Capacity Utilization	60.4%	ICU Level of Service B
Analysis Period (min)	15	

HCM Signalized Intersection Capacity Analysis  
13: Esplanade & 9th Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	58	117	19	91	44	52	0	682	81	0	838	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1			4.1			4.2			4.2		4.2
Lane Util. Factor	1.00			1.00			0.95			0.95		0.95
Frbp. ped/bikes	1.00			1.00			1.00			1.00		1.00
Frbp. ped/bikes	1.00			1.00			1.00			1.00		1.00
Frt	0.99			0.96			0.98			1.00		1.00
Flt Protected	0.99			0.98			1.00			1.00		1.00
Satd. Flow (prot)	1807			1741			3470			3531		3531
Flt Permitted	0.81			0.63			1.00			1.00		1.00
Satd. Flow (perm)	1494			1119			3470			3531		3531
Peak-hour factor, PHF	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Adj. Flow (vph)	82	165	27	128	62	73	0	961	114	0	1180	14
RTOR Reduction (vph)	0	6	0	0	20	0	0	8	0	0	1	0
Lane Group Flow (vph)	0	268	0	0	243	0	0	1067	0	0	1193	0
Confl. Peds. (#/hr)	3	1	1	1	3	5	5	5	5	5	5	24
Confl. Bikes (#/hr)												
Turn Type	Perm	NA	4	Perm	NA	5	NA	NA	9	NA	NA	24
Protected Phases	4			4			2					2
Permitted Phases	4			4			2					2
Actuated Green, G (s)	22.1			22.1			52.6					52.6
Effective Green, g (s)	22.6			22.6			53.1					53.1
Actuated g/C Ratio	0.27			0.27			0.63					0.63
Clearance Time (s)	4.6			4.6			4.7					4.7
Vehicle Extension (s)	3.0			3.0			3.0					3.0
Lane Grp Cap (vph)	401			301			2193					2232
v/s Ratio Prot							0.31					0.34
v/s Ratio Perm	0.18			0.22			0.31					0.34
w/c Ratio	0.67			0.81			0.49					0.53
Uniform Delay, d1	27.4			28.7			8.2					8.6
Progression Factor	1.00			1.00			1.09					1.12
Incremental Delay, d2	4.2			14.6			0.7					0.5
Delay (s)	31.6			43.3			9.6					1.6
Level of Service	C			D			A					A
Approach Delay (s)	31.6			43.3			9.6					1.6
Approach LOS	C			D			A					A
<b>Intersection Summary</b>												
HCM 2000 Control Delay	11.5											
HCM 2000 Level of Service	B											
HCM 2000 Volume to Capacity ratio	0.62											
Actuated Cycle Length (s)	84.0											
Sum of lost time (s)	8.3											
Intersection Capacity Utilization	48.2%											
ICU Level of Service	A											
Analysis Period (min)	15											
Critical Lane Group	c											

HCM Signalized Intersection Capacity Analysis  
13: Esplanade & 9th Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	80	6	70	66	55	0	943	80	0	763	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1			4.1			4.2			4.2		4.2
Lane Util. Factor	1.00			1.00			0.95			0.95		0.95
Frbp. ped/bikes	1.00			1.00			1.00			1.00		1.00
Frbp. ped/bikes	1.00			1.00			1.00			1.00		1.00
Frt	0.99			0.96			0.99			1.00		1.00
Flt Protected	0.98			0.98			1.00			1.00		1.00
Satd. Flow (prot)	1815			1749			3482			3514		3514
Flt Permitted	0.76			0.81			1.00			1.00		1.00
Satd. Flow (perm)	1404			1439			3482			3514		3514
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	61	86	6	75	71	59	0	1014	86	0	820	28
RTOR Reduction (vph)	0	2	0	0	23	0	0	5	0	0	2	0
Lane Group Flow (vph)	0	151	0	0	182	0	0	1095	0	0	846	0
Confl. Peds. (#/hr)							1	16		9		16
Confl. Bikes (#/hr)							5	37		37		28
Turn Type	Perm	NA	7	Perm	NA	5	NA	NA	37	NA	NA	28
Protected Phases	4			4			2					2
Permitted Phases	4			4			2					2
Actuated Green, G (s)	15.6			15.6			55.1					55.1
Effective Green, g (s)	16.1			16.1			55.6					55.6
Actuated g/C Ratio	0.20			0.20			0.70					0.70
Clearance Time (s)	4.6			4.6			4.7					4.7
Vehicle Extension (s)	3.0			3.0			3.0					3.0
Lane Grp Cap (vph)	282			289			2419					2442
v/s Ratio Prot							0.31					0.24
v/s Ratio Perm	0.11			0.13			0.31					0.24
w/c Ratio	0.53			0.63			0.45					0.35
Uniform Delay, d1	28.6			29.2			5.4					4.9
Progression Factor	1.00			1.00			0.68					0.26
Incremental Delay, d2	1.9			4.2			0.6					0.3
Delay (s)	30.5			33.5			4.3					1.6
Level of Service	C			C			A					A
Approach Delay (s)	30.5			33.5			4.3					1.6
Approach LOS	C			C			A					A
<b>Intersection Summary</b>												
HCM 2000 Control Delay	7.6											
HCM 2000 Level of Service	A											
HCM 2000 Volume to Capacity ratio	0.49											
Actuated Cycle Length (s)	80.0											
Sum of lost time (s)	8.3											
Intersection Capacity Utilization	49.3%											
ICU Level of Service	A											
Analysis Period (min)	15											
Critical Lane Group	c											

HCM Unsignalized Intersection Capacity Analysis  
14: Esplanade & 10th Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	3	1	5	2	0	0	56	8	779	5	102	841
Volume (veh/h)	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Sign Control	Stop	0%	0%	0%	0%	0%	0%	0%	0%	Free	Free	0%
Grade	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Peak Hour Factor	4	1	7	3	0	79	11	1097	7	144	1185	14
Hourly flow rate (vph)	8	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Pedestrians	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Width (ft)	1	1	1	1	1	1	1	1	1	1	1	1
Walking Speed (ft/s)	2	2	2	2	2	2	2	2	2	2	2	2
Percent Blockage	0	0	0	0	0	0	0	0	0	0	0	0
Right turn flare (veh)	None	None	None	None	None	None	None	None	None	None	None	None
Median type	None	None	None	None	None	None	None	None	None	None	None	None
Median storage (veh)	0.79	0.79	0.71	0.79	0.79	0.85	0.71	0.71	443	0.85	429	429
Upstream signal (ft)	2138	2619	607	2016	2622	558	1207	1207	1109	1109	1109	1109
pX platoon unblocked	1034	1646	0	878	1651	122	473	473	771	771	771	771
vC, conflicting volume	7.5	6.5	6.9	7.5	6.5	6.9	4.1	4.1	4.1	4.1	4.1	4.1
vC1, stage 1 conf vol	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2	2.2	2.2	2.2	2.2
vC2, stage 2 conf vol	96	98	99	98	100	90	99	99	80	80	80	80
IC, single (s)	108	60	764	153	60	765	765	709	709	709	709	709
IC, 2 stage (s)	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Direction, Lane #	13	82	11	731	373	144	790	409				
Volume Total	4	3	11	0	0	144	0	0				
Volume Left	7	79	0	0	7	0	0	14				
Volume Right	177	672	765	1700	1700	709	1700	1700				
cSH	0.07	0.12	0.01	0.43	0.22	0.20	0.46	0.24				
Volume to Capacity	6	10	1	0	0	19	0	0				
Queue Length 95th (ft)	27.0	11.1	98	0.0	0.0	11.4	0.0	0.0				
Control Delay (s)	D	B	A	B	B	B	B	B				
Lane LOS	D	B	A	B	B	B	B	B				
Approach Delay (s)	27.0	11.1	0.1	1.2	1.2	1.2	1.2	1.2				
Approach LOS	D	B	A	B	B	B	B	B				

Intersection Summary		
Average Delay	1.2	
Intersection Capacity Utilization	41.4%	ICU Level of Service
Analysis Period (min)	15	A

HCM Unsignalized Intersection Capacity Analysis  
14: Esplanade & 10th Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	3	3	9	4	4	1	45	32	1015	8	69	785
Volume (veh/h)	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Sign Control	Stop	0%	0%	0%	0%	0%	0%	0%	0%	Free	Free	0%
Grade	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Peak Hour Factor	3	3	10	4	4	1	48	34	1091	9	74	844
Hourly flow rate (vph)	19	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Pedestrians	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Width (ft)	2	2	2	2	2	2	2	2	2	2	2	2
Walking Speed (ft/s)	0	0	0	0	0	0	0	0	0	0	0	0
Percent Blockage	None	None	None	None	None	None	None	None	None	None	None	None
Right turn flare (veh)	0.89	0.89	0.83	0.89	0.89	0.87	0.83	0.83	443	0.87	429	429
Median type	1680	2193	447	1755	2194	558	873	873	1108	1108	1108	1108
Median storage (veh)	871	1447	0	956	1448	199	428	428	830	830	830	830
Upstream signal (ft)	7.5	6.5	6.9	7.5	6.5	6.9	4.1	4.1	4.1	4.1	4.1	4.1
pX platoon unblocked	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2	2.2	2.2	2.2	2.2
vC, conflicting volume	98	97	99	97	99	93	96	96	89	89	89	89
vC1, stage 1 conf vol	174	98	882	159	97	701	918	918	691	691	691	691
vC2, stage 2 conf vol	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Direction, Lane #	16	54	34	728	372	74	563	291				
Volume Total	3	4	34	0	0	74	0	0				
Volume Left	10	48	0	0	9	0	0	10				
Volume Right	258	502	918	1700	1700	691	1700	1700				
cSH	0.06	0.11	0.04	0.43	0.22	0.11	0.33	0.17				
Volume to Capacity	5	9	3	0	0	9	0	0				
Queue Length 95th (ft)	19.9	13.0	9.1	0.0	0.0	10.8	0.0	0.0				
Control Delay (s)	C	B	A	B	B	B	B	B				
Lane LOS	C	B	A	B	B	B	B	B				
Approach Delay (s)	19.9	13.0	0.3	0.9	0.9	0.9	0.9	0.9				
Approach LOS	C	B	A	B	B	B	B	B				

Intersection Summary		
Average Delay	1.0	
Intersection Capacity Utilization	45.8%	ICU Level of Service
Analysis Period (min)	15	A

HCM Signalized Intersection Capacity Analysis  
 15: Esplanade & 11th Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Volume (vph)	185	0	150	0	0	7	76	752	3	0	803	79	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	12	12	10	12	12	10	11	12	12	12	12	12	
Total Lost time (s)	4.1			4.1		4.2	4.2	4.2		4.2		4.2	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	
Frb. ped/bikes	0.99			0.99		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Fllb. ped/bikes	1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	0.94			0.86		1.00	1.00	1.00	1.00	0.99		0.99	
Flt Protected	0.97			1.00		0.95	1.00	1.00	1.00	1.00		1.00	
Satd. Flow (prot)	1685			1590		1711	3536	3479		3479		3479	
Flt Permitted	0.82			1.00		0.95	1.00	1.00		1.00		1.00	
Satd. Flow (perm)	1425			1590		1711	3536	3479		3479		3479	
Peak-hour factor, PHF	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	
Adj. Flow (vph)	261	0	211	0	0	10	107	1059	4	0	1131	111	
RTOR Reduction (vph)	0	56	0	0	7	0	0	0	0	0	0	8	
Lane Group Flow (vph)	0	416	0	0	3	0	107	1063	0	0	1234	0	
Confl. Peds. (#/hr)	6	6	6	6	6	1	7	7	7	7	7	7	
Confl. Bikes (#/hr)	8			8		2	34	34		34		25	
Turn Type	Perm	NA	NA	NA	Prot	NA	Prot	NA	NA	NA	NA	NA	
Protected Phases	4			8		5	2					6	
Permitted Phases	4			8		8	8					6	
Actuated Green, G (s)	27.3			27.3		6.5	47.4					36.2	
Effective Green, g (s)	27.8			27.8		7.0	47.9					36.7	
Actuated g/C Ratio	0.33			0.33		0.08	0.57					0.44	
Clearance Time (s)	4.6			4.6		4.7	4.7					4.7	
Vehicle Extension (s)	4.0			2.0		0.5	4.0					4.0	
Lane Grp Cap (vph)	471			526		142	2016					1519	
v/s Ratio Prot	0.00			0.00		0.06	0.30					0.35	
v/c Ratio	0.88			0.01		0.75	0.53					0.81	
Uniform Delay, d1	26.6			18.8		37.7	11.1					20.6	
Progression Factor	1.00			1.00		0.82	0.79					1.00	
Incremental Delay, d2	18.0			0.0		16.5	9.6					4.8	
Delay (s)	44.6			18.8		47.3	9.6					25.5	
Level of Service	D			B		D	A					C	
Approach Delay (s)	44.6			18.8		13.1	25.5					25.5	
Approach LOS	D			B		B	C					C	
<b>Intersection Summary</b>													
HCM 2000 Control Delay	23.6											HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83												
Actuated Cycle Length (s)	84.0											Sum of lost time (s)	12.5
Intersection Capacity Utilization	65.7%											ICU Level of Service	C
Analysis Period (min)	15												
c. Critical Lane Group													

HCM Signalized Intersection Capacity Analysis  
 15: Esplanade & 11th Ave

5/23/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Volume (vph)	121	0	91	1	2	4	153	903	0	0	777	164	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	12	12	10	12	12	10	11	12	12	12	12	12	
Total Lost time (s)	4.1			4.1		4.2	4.2	4.2		4.2		4.2	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	
Frb. ped/bikes	0.99			0.99		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Fllb. ped/bikes	1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	0.94			0.92		1.00	1.00	1.00	1.00	0.97		0.97	
Flt Protected	0.97			1.00		0.95	1.00	1.00	1.00	1.00		1.00	
Satd. Flow (prot)	1688			1691		1711	3539	3412		3412		3412	
Flt Permitted	0.82			0.96		0.95	1.00	1.00		1.00		1.00	
Satd. Flow (perm)	1423			1642		1711	3539	3412		3412		3412	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	130	0	98	1	2	4	165	971	0	0	835	176	
RTOR Reduction (vph)	0	70	0	0	3	0	0	0	0	0	0	18	
Lane Group Flow (vph)	0	158	0	0	4	0	165	971	0	0	993	0	
Confl. Peds. (#/hr)	1	2	2	2	2	1	5	23	23	23	23	5	
Confl. Bikes (#/hr)	8			8		2	34	34		34		43	
Turn Type	Perm	NA	NA	Perm	NA	Prot	NA	Prot	NA	NA	NA	NA	
Protected Phases	4			8		8	8					6	
Permitted Phases	4			8		8	8					6	
Actuated Green, G (s)	15.0			15.0		15.0	12.3	55.7				38.7	
Effective Green, g (s)	15.5			15.5		15.5	12.8	56.2				39.2	
Actuated g/C Ratio	0.19			0.19		0.16	0.70	0.70				0.49	
Clearance Time (s)	4.6			4.6		4.7	4.7	4.7				4.7	
Vehicle Extension (s)	4.0			2.0		0.5	4.0	4.0				4.0	
Lane Grp Cap (vph)	275			318		273	2486	1671				1671	
v/s Ratio Prot	0.11			0.00		0.10	0.27	0.29				0.29	
v/c Ratio	0.57			0.01		0.60	0.39	0.59				0.59	
Uniform Delay, d1	29.3			26.1		31.2	4.9	14.7				14.7	
Progression Factor	1.00			1.00		0.68	0.40	1.00				1.00	
Incremental Delay, d2	3.4			0.0		2.4	0.4	1.6				1.6	
Delay (s)	32.7			26.1		23.6	2.4	16.2				16.2	
Level of Service	C			C		C	A	B				B	
Approach Delay (s)	32.7			26.1		5.4	16.2	16.2				16.2	
Approach LOS	C			C		A	B	B				B	
<b>Intersection Summary</b>													
HCM 2000 Control Delay	12.7											HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59												
Actuated Cycle Length (s)	80.0											Sum of lost time (s)	12.5
Intersection Capacity Utilization	64.8%											ICU Level of Service	C
Analysis Period (min)	15												
c. Critical Lane Group													



## MOVEMENT SUMMARY

Site: AM Peak Hour - Memorial Way Existing Volumes

Esplanade Area Complete Streets Plan  
Esplanade/Memorial Way Roundabout

Mov ID	OD Mov	Demand Flows Total HV veh/h	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance It	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Esplanade										
3	L2	53	1.0	0.331	LOS A	1.8	45.6	0.48	0.36	29.7
8	T1	628	2.0	0.331	LOS A	1.8	45.6	0.48	0.36	29.7
18	R2	47	1.0	0.331	LOS A	1.8	45.6	0.48	0.36	28.7
Approach										
		728	1.9	0.331	LOS A	1.8	45.6	0.48	0.36	29.6
East: WB Memorial Way										
1	L2	72	1.0	0.319	LOS A	1.5	37.8	0.67	0.67	28.1
6	T1	14	1.0	0.319	LOS A	1.5	37.8	0.67	0.67	28.0
16	R2	188	1.0	0.319	LOS A	1.5	37.8	0.67	0.67	26.8
Approach										
		274	1.0	0.319	LOS A	1.5	37.8	0.67	0.67	27.2
North: SB Esplanade										
7	L2	158	1.0	0.319	LOS A	1.8	45.9	0.36	0.21	29.2
4	T1	589	2.0	0.319	LOS A	1.8	45.9	0.36	0.21	29.9
14	R2	38	1.0	0.319	LOS A	1.8	45.9	0.36	0.21	29.1
Approach										
		785	1.8	0.319	LOS A	1.8	45.9	0.36	0.21	29.7
West: EB Bidwell Mansion										
5	L2	15	1.0	0.159	LOS A	0.7	16.7	0.64	0.64	29.7
2	T1	76	1.0	0.159	LOS A	0.7	16.7	0.64	0.64	29.7
12	R2	32	1.0	0.159	LOS A	0.7	16.7	0.64	0.64	28.3
Approach										
		122	1.0	0.159	LOS A	0.7	16.7	0.64	0.64	29.3
All Vehicles										
		1909	1.6	0.331	LOS A	1.8	45.9	0.47	0.36	29.3

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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8000493, 6019158, W-TRANS, PLUS / Floating

**SIDRA  
INTERSECTION 6**

## MOVEMENT SUMMARY

Site: PM Peak Hour - Memorial Way Existing Volumes

Esplanade Area Complete Streets Plan  
Esplanade/Memorial Way Roundabout

Mov ID	OD Mov	Demand Flows Total HV veh/h	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance It	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Esplanade										
3	L2	11	1.0	0.473	LOS A	3.0	76.3	0.56	0.43	28.7
8	T1	980	2.0	0.473	LOS A	3.0	76.3	0.56	0.43	28.5
18	R2	53	1.0	0.473	LOS A	3.0	76.3	0.56	0.43	27.4
Approach										
		1043	1.9	0.473	LOS A	3.0	76.3	0.56	0.43	28.4
East: WB Memorial Way										
1	L2	47	1.0	0.364	LOS B	1.7	42.9	0.74	0.77	26.4
6	T1	7	1.0	0.364	LOS B	1.7	42.9	0.74	0.77	26.4
16	R2	180	1.0	0.364	LOS B	1.7	42.9	0.74	0.77	25.3
Approach										
		235	1.0	0.364	LOS B	1.7	42.9	0.74	0.77	25.5
North: SB Esplanade										
7	L2	184	1.0	0.320	LOS A	1.9	48.1	0.24	0.11	29.3
4	T1	637	2.0	0.320	LOS A	1.9	48.1	0.24	0.11	30.1
14	R2	27	1.0	0.320	LOS A	1.9	48.0	0.24	0.11	29.4
Approach										
		848	1.8	0.320	LOS A	1.9	48.1	0.24	0.11	29.9
West: EB Bidwell Mansion										
5	L2	17	1.0	0.108	LOS A	0.4	10.9	0.63	0.62	29.6
2	T1	44	1.0	0.108	LOS A	0.4	10.9	0.63	0.62	29.6
12	R2	18	1.0	0.108	LOS A	0.4	10.9	0.63	0.62	28.2
Approach										
		79	1.0	0.108	LOS A	0.4	10.9	0.63	0.62	29.3
All Vehicles										
		2205	1.7	0.473	LOS A	3.0	76.3	0.46	0.35	28.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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**SIDRA  
INTERSECTION 6**

HCM Unsignalized Intersection Capacity Analysis  
2: Esplanade & Francis Willard Ave

4/26/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	0	0	6	0	0	43	124	612	21	28	721	92
Volume (veh/h)	0	0	6	0	0	43	124	612	21	28	721	92
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	0	0	8	0	0	61	175	862	30	39	1015	130
Pedestrians	37			23			2					
Lane Width (ft)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Walking Speed (ft/s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Percent Blockage	3			2			0				0	
Right turn flare (veh)												
Median type												None
Median storage (veh)												288
Upstream signal (ft)	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
pX, platoon unblocked	2037	2460	612	1846	2510	469	1182				915	
vC, conflicting volume												
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1833	2345	105	1601	2406	469	796				915	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	99	100	100	89	73				95	
cM capacity (veh/h)	25	19	742	42	18	531	657				727	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	8	61	175	575	317	39	677	468				
Volume Left	0	0	175	0	0	39	0	0				
Volume Right	8	61	0	0	30	0	0	130				
cSH	742	531	657	1700	1700	727	1700	1700				
Volume to Capacity	0.01	0.11	0.27	0.34	0.19	0.05	0.40	0.28				
Queue Length 95th (ft)	1	10	27	0	0	4	0	0				
Control Delay (s)	9.9	12.7	12.5	0.0	0.0	10.2	0.0	0.0				
Lane LOS	A	B	B	B	B	B	B	B				
Approach Delay (s)	9.9	12.7	2.0			0.3						
Approach LOS	A	B										

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	44.1%	ICU Level of Service	A
Analysis Period (min)	15		

Esplanade Area Complete Street Plan  
AM Preferred Plan with Roundabouts

Synchro 8 Report  
W-Trans

HCM Unsignalized Intersection Capacity Analysis  
2: Esplanade & Francis Willard Ave

4/26/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	0	0	3	0	0	11	48	1052	4	25	800	74
Volume (veh/h)	0	0	3	0	0	11	48	1052	4	25	800	74
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	0	3	0	0	12	52	1131	4	27	860	80
Pedestrians	46			7			1					
Lane Width (ft)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Walking Speed (ft/s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Percent Blockage	4			1			0				0	
Right turn flare (veh)												
Median type												None
Median storage (veh)												288
Upstream signal (ft)	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
pX, platoon unblocked	1680	2245	517	1732	2283	575	986				1142	
vC, conflicting volume												
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1503	2144	182	1561	2186	575	714				1142	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	100	100	100	97	93				96	
cM capacity (veh/h)	61	36	702	59	34	459	747				604	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	3	12	52	754	381	27	573	366				
Volume Left	0	0	52	0	0	27	0	0				
Volume Right	3	12	0	0	4	0	0	80				
cSH	702	459	747	1700	1700	604	1700	1700				
Volume to Capacity	0.00	0.03	0.07	0.44	0.22	0.04	0.34	0.22				
Queue Length 95th (ft)	0	2	6	0	0	3	0	0				
Control Delay (s)	10.2	13.1	10.2	0.0	0.0	11.2	0.0	0.0				
Lane LOS	B	B	B	B	B	B	B	B				
Approach Delay (s)	10.2	13.1	0.4			0.3						
Approach LOS	B	B										

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		

Esplanade Area Complete Street Plan  
PM Preferred Plan with Roundabouts

Synchro 8 Report  
W-Trans

HCM Signalized Intersection Capacity Analysis  
 3: Esplanade & Lincoln Ave

4/26/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	195	0	93	0	0	25	0	640	25	0	748	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6					4.6		4.7			4.7	
Lane Util. Factor	1.00					1.00		0.95			0.95	
Frbp, ped/bikes	0.96					1.00		1.00			1.00	
Frbp, ped/bikes	1.00					1.00		1.00			1.00	
Frt	0.97					0.86		0.99			1.00	
Frt Protected	0.96					1.00		1.00			1.00	
Satd. Flow (prot)	1653					1611		3510			3539	
Flt Permitted	0.97					1.00		1.00			1.00	
Satd. Flow (perm)	1653					1611		3510			3539	
Peak-hour factor, PHF	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Adj. Flow (vph)	275	0	131	0	0	35	0	901	35	0	1054	0
RTOR Reduction (vph)	0	23	0	0	0	24	0	2	0	0	0	0
Lane Group Flow (vph)	0	383	0	0	0	11	0	934	0	0	1054	0
Confl. Peds. (#/hr)			107	107		96			13	13		96
Confl. Bikes (#/hr)			6						34			57
Turn Type	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA	NA	NA	NA
Protected Phases		4										2
Permitted Phases		4				4						2
Actuated Green, G (s)	25.3		25.3			25.3		49.4			49.4	
Effective Green, g (s)	25.3		25.3			25.3		49.4			49.4	
Actuated g/C Ratio	0.30		0.30			0.30		0.59			0.59	
Clearance Time (s)	4.6		4.6			4.6		4.7			4.7	
Vehicle Extension (s)	3.0		3.0			3.0		3.0			3.0	
Lane Grp Cap (vph)	497		485			485		2064			2081	
v/s Ratio Prot								0.27			c0.30	
v/s Ratio Perm	0.23		0.77			0.01		0.01			0.51	
v/c Ratio	26.7		26.7			20.6		9.7			10.1	
Uniform Delay, d1	1.00		1.00			1.00		1.00			1.00	
Progression Factor	7.2		7.2			0.0		0.7			0.6	
Incremental Delay, d2	34.0		34.0			20.7		10.4			2.2	
Delay (s)	C		C			C		B			A	
Level of Service	C		C			C		B			A	
Approach Delay (s)	34.0		34.0			20.7		10.4			2.2	
Approach LOS	C		C			C		B			A	
Intersection Summary												
HCM 2000 Control Delay	10.9 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.60											
Actuated Cycle Length (s)	84.0 Sum of lost time (s)											
Intersection Capacity Utilization	53.4% ICU Level of Service											
Analysis Period (min)	15											
c. Critical Lane Group												

Esplanade Area Complete Street Plan  
 AM Preferred Plan with Roundabouts

Synchro 8 Report  
 W-Trans

HCM Signalized Intersection Capacity Analysis  
 3: Esplanade & Lincoln Ave

4/26/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	0	40	0	0	25	0	1038	25	0	860	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6					4.6		4.7			4.7	
Lane Util. Factor	1.00					1.00		0.95			0.95	
Frbp, ped/bikes	0.99					1.00		1.00			1.00	
Frbp, ped/bikes	1.00					1.00		1.00			1.00	
Frt	0.97					0.86		1.00			1.00	
Frt Protected	0.96					1.00		1.00			1.00	
Satd. Flow (prot)	1720					1611		3521			3536	
Flt Permitted	0.96					1.00		1.00			1.00	
Satd. Flow (perm)	1720					1611		3521			3536	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	124	0	43	0	0	27	0	1116	27	0	925	3
RTOR Reduction (vph)	0	19	0	0	0	21	0	1	0	0	0	0
Lane Group Flow (vph)	0	148	0	0	0	6	0	1142	0	0	928	0
Confl. Peds. (#/hr)			14	14		55			14	14		55
Confl. Bikes (#/hr)			4						36			30
Turn Type	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA	NA	NA	NA
Protected Phases		4										2
Permitted Phases		4				4						2
Actuated Green, G (s)	17.8		17.8			17.8		52.9			52.9	
Effective Green, g (s)	17.8		17.8			17.8		52.9			52.9	
Actuated g/C Ratio	0.22		0.22			0.22		0.66			0.66	
Clearance Time (s)	4.6		4.6			4.6		4.7			4.7	
Vehicle Extension (s)	3.0		3.0			3.0		3.0			3.0	
Lane Grp Cap (vph)	382		382			358		2328			2338	
v/s Ratio Prot								c0.32			0.26	
v/s Ratio Perm	0.09		0.39			0.02		0.49			0.40	
v/c Ratio	26.5		26.5			24.3		6.8			6.2	
Uniform Delay, d1	1.00		1.00			1.00		1.00			1.00	
Progression Factor	0.7		0.7			0.0		0.7			0.4	
Incremental Delay, d2	27.1		27.1			24.3		7.5			1.2	
Delay (s)	C		C			C		A			A	
Level of Service	C		C			C		A			A	
Approach Delay (s)	27.1		27.1			24.3		7.5			1.2	
Approach LOS	C		C			C		A			A	
Intersection Summary												
HCM 2000 Control Delay	6.6 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.46											
Actuated Cycle Length (s)	80.0 Sum of lost time (s)											
Intersection Capacity Utilization	57.7% ICU Level of Service											
Analysis Period (min)	15											
c. Critical Lane Group												

Esplanade Area Complete Street Plan  
 PM Preferred Plan with Roundabouts

Synchro 8 Report  
 W-Trans

HCM Signalized Intersection Capacity Analysis  
4: Esplanade & W Sacramento Ave

4/26/2016

Movement	EBL	EBR	NBL	NBT	SBR	SBR
Lane Configurations	0	118	205	665	630	281
Volume (vph)	0	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.6	4.7	4.7	4.7	4.7	4.7
Total Lost time (s)	1.00	1.00	1.00	0.95	0.95	0.95
Lane Util. Factor	0.96	1.00	1.00	1.00	1.00	0.95
Flpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flt	0.86	1.00	1.00	1.00	0.95	1.00
Flt Protected	1.00	0.95	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1548	1770	3539	3196	3196	3196
Flt Permitted	1.00	0.95	1.00	1.00	1.00	1.00
Satd. Flow (perm)	1548	1770	3539	3196	3196	3196
Peak-hour factor, PHF	0.71	0.71	0.71	0.71	0.71	0.71
Adj. Flow (vph)	0	166	289	937	887	396
RTOR Reduction (vph)	133	0	0	0	49	0
Lane Group Flow (vph)	33	0	289	937	1234	0
Confl. Peds. (#/hr)	1	17	57			57
Confl. Bikes (#/hr)	9					48
Turn Type	Prot	Prot	Prot	NA	NA	NA
Protected Phases	4	5	2	6	6	
Permitted Phases						
Actuated Green, G (s)	16.6	15.3	58.1	38.1	38.1	
Effective Green, g (s)	16.6	15.3	58.1	38.1	38.1	
Actuated g/C Ratio	0.20	0.18	0.69	0.45	0.45	
Clearance Time (s)	4.6	4.7	4.7	4.7	4.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	305	322	2447	1449	1449	
v/s Ratio Prot	c0.02	c0.16	0.26	c0.39	c0.39	
v/s Ratio Perm						
v/c Ratio	0.11	0.90	0.38	0.85	0.85	
Uniform Delay, d1	27.6	33.6	5.4	20.4	20.4	
Progression Factor	1.00	0.87	0.57	1.00	1.00	
Incremental Delay, d2	0.2	23.9	0.4	6.5	6.5	
Delay (s)	27.8	53.2	3.5	26.9	26.9	
Level of Service	C	D	A	C	C	
Approach Delay (s)	27.8		15.2	26.9	26.9	
Approach LOS	C		B	C	C	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			21.6			C
HCM 2000 Volume to Capacity ratio			0.68			
Actuated Cycle Length (s)			84.0			14.0
Intersection Capacity Utilization			64.5%			C
Analysis Period (min)			15			
c. Critical Lane Group						

Esplanade Area Complete Street Plan  
AM Preferred Plan with Roundabouts

Synchro 8 Report  
W-Trans

HCM Signalized Intersection Capacity Analysis  
4: Esplanade & W Sacramento Ave

4/26/2016

Movement	EBL	EBR	NBL	NBT	SBR	SBR
Lane Configurations	0	120	204	974	732	122
Volume (vph)	0	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.6	4.7	4.7	4.7	4.7	4.7
Total Lost time (s)	1.00	1.00	1.00	0.95	0.95	0.95
Lane Util. Factor	0.93	1.00	1.00	1.00	1.00	0.99
Flpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flt	0.86	1.00	1.00	1.00	0.98	1.00
Flt Protected	1.00	0.95	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1494	1770	3539	3425	3425	3425
Flt Permitted	1.00	0.95	1.00	1.00	1.00	1.00
Satd. Flow (perm)	1494	1770	3539	3425	3425	3425
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	129	219	1047	787	131
RTOR Reduction (vph)	104	0	0	0	13	0
Lane Group Flow (vph)	25	0	219	1047	905	0
Confl. Peds. (#/hr)	4	20				20
Confl. Bikes (#/hr)	50					23
Turn Type	Prot	Prot	Prot	NA	NA	NA
Protected Phases	4	5	2	6	6	
Permitted Phases						
Actuated Green, G (s)	15.5	15.3	55.2	35.2	35.2	
Effective Green, g (s)	15.5	15.3	55.2	35.2	35.2	
Actuated g/C Ratio	0.19	0.19	0.69	0.44	0.44	
Clearance Time (s)	4.6	4.7	4.7	4.7	4.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	289	338	2441	1507	1507	
v/s Ratio Prot	c0.02	c0.12	0.30	c0.26	c0.26	
v/s Ratio Perm						
v/c Ratio	0.09	0.65	0.43	0.60	0.60	
Uniform Delay, d1	26.4	29.9	5.5	17.0	17.0	
Progression Factor	1.00	0.80	0.44	1.00	1.00	
Incremental Delay, d2	0.1	3.8	0.5	1.8	1.8	
Delay (s)	26.6	27.8	2.9	18.8	18.8	
Level of Service	C	C	A	B	B	
Approach Delay (s)	26.6		7.2	18.8	18.8	
Approach LOS	C		A	B	B	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			12.9			B
HCM 2000 Volume to Capacity ratio			0.49			
Actuated Cycle Length (s)			80.0			14.0
Intersection Capacity Utilization			56.7%			B
Analysis Period (min)			15			
c. Critical Lane Group						

Esplanade Area Complete Street Plan  
PM Preferred Plan with Roundabouts

Synchro 8 Report  
W-Trans

## MOVEMENT SUMMARY

Site: AM Peak Hour - 1st Ave Existing Volumes

Esplanade Area Complete Streets Plan  
Esplanade/First Avenue Roundabout  
(assumes 30 left-turns on each direction of Esplanade)  
Roundabout

Mov ID	OD Mov	Demand Flows total HV veh/h	Deg. Satn %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Esplanade										
3	L2	32	1.0	0.421	LOS A	2.3	58.5	0.65	0.63	28.1
8	T1	642	2.0	0.421	LOS A	2.3	58.6	0.65	0.63	28.0
18	R2	74	1.0	0.421	LOS A	2.3	58.6	0.65	0.63	27.0
Approach										
		747	1.9	0.421	LOS A	2.3	58.6	0.65	0.63	27.9
East: WB First Avenue										
1	L2	71	1.0	0.609	LOS B	4.4	111.1	0.82	0.93	24.9
6	T1	365	1.0	0.609	LOS B	4.4	111.1	0.82	0.93	24.9
16	R2	65	1.0	0.609	LOS B	4.4	111.1	0.82	0.93	23.9
Approach										
		501	1.0	0.609	LOS B	4.4	111.1	0.82	0.93	24.8
North: SB Esplanade										
7	L2	32	1.0	0.556	LOS B	3.9	99.7	0.74	0.78	26.4
4	T1	896	2.0	0.556	LOS B	3.9	99.7	0.74	0.78	26.3
14	R2	94	1.0	0.556	LOS B	3.9	99.7	0.74	0.78	25.4
Approach										
		981	1.9	0.556	LOS B	3.9	99.7	0.74	0.78	26.2
West: EB First Avenue										
5	L2	68	1.0	0.696	LOS C	5.2	131.3	0.87	1.05	22.1
2	T1	360	1.0	0.696	LOS C	5.2	131.3	0.87	1.05	22.1
12	R2	41	1.0	0.696	LOS C	5.2	131.3	0.87	1.05	21.3
Approach										
		469	1.0	0.696	LOS C	5.2	131.3	0.87	1.05	22.0
All Vehicles										
		2699	1.6	0.696	LOS B	5.2	131.3	0.75	0.81	25.5

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional IM1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

## MOVEMENT SUMMARY

Site: PM Peak Hour - 1st Ave Existing Volumes

Esplanade Area Complete Streets Plan  
Esplanade/First Avenue Roundabout  
(assumes 30 left-turns on each direction of Esplanade)  
Roundabout

Mov ID	OD Mov	Demand Flows total HV veh/h	Deg. Satn %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Esplanade										
3	L2	32	1.0	0.612	LOS B	4.8	120.7	0.78	0.86	25.5
8	T1	937	2.0	0.612	LOS B	4.8	120.8	0.78	0.86	25.4
18	R2	89	1.0	0.612	LOS B	4.8	120.8	0.78	0.86	24.5
Approach										
		1068	1.9	0.612	LOS B	4.8	120.8	0.78	0.86	25.3
East: WB First Avenue										
1	L2	98	1.0	1.069	LOS F	28.6	720.6	1.00	2.33	10.3
6	T1	445	1.0	1.069	LOS F	28.6	720.6	1.00	2.33	10.3
16	R2	121	1.0	1.069	LOS F	28.6	720.6	1.00	2.33	10.1
Approach										
		664	1.0	1.069	LOS F	28.6	720.6	1.00	2.33	10.2
North: SB Esplanade										
7	L2	32	1.0	0.520	LOS B	3.3	84.6	0.74	0.79	26.5
4	T1	753	2.0	0.520	LOS B	3.3	84.7	0.74	0.79	26.4
14	R2	67	1.0	0.520	LOS B	3.3	84.7	0.74	0.79	25.5
Approach										
		852	1.9	0.520	LOS B	3.3	84.7	0.74	0.79	26.3
West: EB First Avenue										
5	L2	79	1.0	0.681	LOS B	5.2	131.1	0.87	1.03	22.8
2	T1	376	1.0	0.681	LOS B	5.2	131.1	0.87	1.03	22.8
12	R2	41	1.0	0.681	LOS B	5.2	131.1	0.87	1.03	22.0
Approach										
		496	1.0	0.681	LOS B	5.2	131.1	0.87	1.03	22.8
All Vehicles										
		3069	1.6	1.069	LOS C	28.6	720.6	0.83	1.19	19.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional IM1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

HCM Unsignalized Intersection Capacity Analysis  
6: Esplanade & 2nd Ave

4/26/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (veh/h)	3	1	19	1	1	1	18	51	700	5	36	866
Sign Control				Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	4	1	27	1	1	25	72	986	7	51	1220	68
Pedestrians	13			10			3				1	
Lane Width (ft)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Walking Speed (ft/s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Percent Blockage	1			1			0			0		0
Right turn flare (veh)												
Median type												None
Median storage (veh)												452
Upstream signal (ft)	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
pX, platoon unblocked	2032	2515	660	1885	2545	507	1300					1003
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCu, unblocked vol	1809	2403	121	1628	2440	507	909					1003
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1					4.1
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2					2.2
p0 queue free %	86	93	96	97	93	95	88					93
cM capacity (veh/h)	30	21	728	42	20	506	599					680
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	32	28	72	657	336	51	813	474				
Volume Left	4	1	72	0	0	51	0	0				0
Volume Right	27	25	0	0	7	0	0	68				
cSH	133	183	599	1700	1700	680	1700	1700				
Volume to Capacity	0.24	0.15	0.12	0.39	0.20	0.07	0.48	0.28				
Queue Length 95th (ft)	22	13	10	0	0	6	0	0				
Control Delay (s)	40.4	28.1	11.8	0.0	0.0	10.7	0.0	0.0				
Lane LOS	E	D	B	B	B	B	B	B				
Approach Delay (s)	40.4	28.1	0.8		0.4							
Approach LOS	E	D										
<b>Intersection Summary</b>												
Average Delay	1.4											
Intersection Capacity Utilization	43.2%											
ICU Level of Service	A											
Analysis Period (min)	15											

Esplanade Area Complete Street Plan  
AM Preferred Plan with Roundabouts

Synchro 8 Report  
W-Trans

HCM Unsignalized Intersection Capacity Analysis  
6: Esplanade & 2nd Ave

4/26/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (veh/h)	4	0	11	4	0	11	48	1010	16	62	750	17
Sign Control				Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	0	12	4	0	12	52	1086	17	67	806	18
Pedestrians	14			3			1				2	
Lane Width (ft)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Walking Speed (ft/s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Percent Blockage	1			0			0			0		0
Right turn flare (veh)												
Median type												None
Median storage (veh)												452
Upstream signal (ft)	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
pX, platoon unblocked	1623	2172	427	1750	2173	557	839					1106
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCu, unblocked vol	1519	2110	233	1656	2110	557	675					1106
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1					4.1
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2					2.2
p0 queue free %	93	100	98	92	100	97	94					89
cM capacity (veh/h)	63	39	706	51	39	472	838					625
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	16	16	52	724	379	67	538	287				
Volume Left	4	4	52	0	0	67	0	0				0
Volume Right	12	12	0	0	17	0	0	18				
cSH	190	147	838	1700	1700	625	1700	1700				
Volume to Capacity	0.08	0.11	0.06	0.43	0.22	0.11	0.32	0.17				
Queue Length 95th (ft)	7	9	5	0	0	9	0	0				
Control Delay (s)	25.7	32.5	9.6	0.0	0.0	11.4	0.0	0.0				
Lane LOS	D	D	A	A	B	B	B	B				
Approach Delay (s)	25.7	32.5	0.4		0.9							
Approach LOS	D	D										
<b>Intersection Summary</b>												
Average Delay	1.1											
Intersection Capacity Utilization	45.8%											
ICU Level of Service	A											
Analysis Period (min)	15											

Esplanade Area Complete Street Plan  
PM Preferred Plan with Roundabouts

Synchro 8 Report  
W-Trans

HCM Signalized Intersection Capacity Analysis  
7: Esplanade & 3rd Ave

4/26/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Volume (vph)	73	64	24	46	56	32	0	719	18	0	882
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6	4.7		4.7			4.7
Lane Util. Factor	1.00	1.00	1.00	0.99	1.00	1.00		0.95			0.95
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00
Frt	0.98	0.98	0.98	0.98	0.98	0.98		1.00			1.00
Flt Protected	1779	1779	1779	1760	1760	3523		3523			3525
Satd. Flow (prot)	0.71	0.71	0.71	0.71	0.71	0.71		0.71			0.71
Flt Permitted	1300	1300	1419	1419	1419	3523		3523			3525
Satd. Flow (perm)	0.71	0.71	0.71	0.71	0.71	0.71		0.71			0.71
Peak-hour factor, PHF	103	90	34	65	79	45		1013	25	0	1242
Adj. Flow (vph)	0	9	0	0	16	0		1	0	0	1
RTOR Reduction (vph)	0	218	0	0	173	0		1037	0	0	1266
Lane Group Flow (vph)	3	2	2	2	3	8		8	9	9	8
Confl. Peds. (#/hr)											
Confl. Bikes (#/hr)											
Turn Type	Perm	NA	NA	Perm	NA	NA		NA			NA
Protected Phases	4			4				2			2
Permitted Phases	4			4				2			2
Actuated Green, G (s)	18.5	18.5	18.5	18.5	18.5	18.5		56.2			56.2
Effective Green, g (s)	18.5	18.5	18.5	18.5	18.5	18.5		56.2			56.2
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22	0.22		0.67			0.67
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6	4.7		4.7			4.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0
Lane Grp Cap (vph)	286			312				2357			2358
v/s Ratio Prot				0.12				0.29			c0.36
v/s Ratio Perm	c0.17			0.55				0.44			0.54
v/c Ratio	0.76			29.1				6.5			7.2
Uniform Delay, d1	30.7			1.00				1.00			0.64
Progression Factor	1.13			2.1				0.6			0.8
Incremental Delay, d2	42.0			31.2				7.1			5.4
Delay (s)	D			C				A			A
Level of Service	D			C				A			A
Approach Delay (s)	42.0			31.2				7.1			5.4
Approach LOS	D			C				A			A
<b>Intersection Summary</b>											
HCM 2000 Control Delay	10.9										
HCM 2000 Level of Service	B										
HCM 2000 Volume to Capacity ratio	0.59										
Actuated Cycle Length (s)	84.0										
Sum of lost time (s)	9.3										
Intersection Capacity Utilization	46.3%										
ICU Level of Service	A										
Analysis Period (min)	15										
c. Critical Lane Group											

Esplanade Area Complete Street Plan  
AM Preferred Plan with Roundabouts

Synchro 8 Report  
W-Trans

HCM Signalized Intersection Capacity Analysis  
7: Esplanade & 3rd Ave

4/26/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Volume (vph)	50	38	12	23	31	41	0	1005	16	0	790
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6	4.7		4.7			4.7
Lane Util. Factor	1.00	1.00	1.00	0.99	1.00	1.00		0.95			0.95
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00
Frt	0.98	0.98	0.98	0.98	0.98	0.98		1.00			1.00
Flt Protected	1782	1782	1782	1718	1718	3529		3529			3524
Satd. Flow (prot)	0.80	0.80	0.80	0.92	0.92	1.00		1.00			1.00
Flt Permitted	1462	1462	1606	1606	1606	3529		3529			3524
Satd. Flow (perm)	0.83	0.83	0.83	0.93	0.93	0.93		0.93			0.93
Peak-hour factor, PHF	54	41	13	25	33	44		1081	17	0	849
Adj. Flow (vph)	0	8	0	0	37	0		1	0	0	1
RTOR Reduction (vph)	0	100	0	0	65	0		1097	0	0	867
Lane Group Flow (vph)	2	2	2	2	2	14		14	3	3	14
Confl. Peds. (#/hr)											
Confl. Bikes (#/hr)											
Turn Type	Perm	NA	NA	Perm	NA	NA		NA			NA
Protected Phases	4			4				2			2
Permitted Phases	4			4				2			2
Actuated Green, G (s)	12.3	12.3	12.3	12.3	12.3	12.3		58.4			58.4
Effective Green, g (s)	12.3	12.3	12.3	12.3	12.3	12.3		58.4			58.4
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.15	0.15		0.73			0.73
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6	4.7		4.7			4.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0
Lane Grp Cap (vph)	224			246				2576			2572
v/s Ratio Prot				0.04				c0.31			0.25
v/s Ratio Perm	c0.07			0.26				0.43			0.34
v/c Ratio	0.44			29.9				4.2			3.9
Uniform Delay, d1	30.7			1.00				1.00			1.06
Progression Factor	1.14			2.1				0.5			0.3
Incremental Delay, d2	42.0			30.4				4.7			4.5
Delay (s)	D			C				A			A
Level of Service	D			C				A			A
Approach Delay (s)	42.0			30.4				4.7			4.5
Approach LOS	D			C				A			A
<b>Intersection Summary</b>											
HCM 2000 Control Delay	7.2										
HCM 2000 Level of Service	A										
HCM 2000 Volume to Capacity ratio	0.43										
Actuated Cycle Length (s)	80.0										
Sum of lost time (s)	9.3										
Intersection Capacity Utilization	47.2%										
ICU Level of Service	A										
Analysis Period (min)	15										
c. Critical Lane Group											

Esplanade Area Complete Street Plan  
PM Preferred Plan with Roundabouts

Synchro 8 Report  
W-Trans



HCM Unsignalized Intersection Capacity Analysis  
8: Esplanade & 4th Ave

4/26/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	14	7	39	1	1	8	53	767	4	63	860	61
Volume (veh/h)												
Sign Control												
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	20	10	55	1	1	11	75	1080	6	89	1211	86
Pedestrians												
Lane Width (ft)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Walking Speed (ft/s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Percent Blockage	1	1	1	1	1	1	1	1	1	1	1	1
Right turn flare (veh)												
Median type												
Median storage (veh)												
Upstream signal (ft)	0.87	0.87	0.80	0.87	0.87	0.87	0.80	0.80	0.87	0.87	0.87	0.87
pX, platoon unblocked	2141	2686	660	2089	2726	554	1305	1305	1097	1097	1097	1097
vC, conflicting volume												
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1336	1964	84	1277	2011	189	888	888	813	813	813	813
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1	4.1	4.1	4.1	4.1	4.1
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2	2.2	2.2	2.2	2.2
p0 queue free %	74	76	93	98	96	98	88	88	87	87	87	87
cM capacity (veh/h)	75	41	763	65	38	708	605	605	698	698	698	698
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	85	14	75	720	366	89	808	490				
Volume Left	20	1	75	0	0	89	0	0				
Volume Right	65	11	0	0	0	6	0	86				
cSH	146	189	605	1700	1700	698	1700	1700				
Volume to Capacity	0.58	0.07	0.12	0.42	0.22	0.13	0.48	0.29				
Queue Length 95th (ft)	74	6	10	0	0	11	0	0				
Control Delay (s)	59.0	25.6	11.8	0.0	0.0	10.9	0.0	0.0				
Lane LOS	F	D	B	B	B	B	B	B				
Approach Delay (s)	59.0	25.6	0.8			0.7						
Approach LOS	F	D										
<b>Intersection Summary</b>												
Average Delay	2.7											
Intersection Capacity Utilization	46.6%											
ICU Level of Service	A											
Analysis Period (min)	15											

Esplanade Area Complete Street Plan  
AM Preferred Plan with Roundabouts

Synchro 8 Report  
W-Trans

HCM Unsignalized Intersection Capacity Analysis  
8: Esplanade & 4th Ave

4/26/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	31	5	45	2	3	7	62	1022	12	63	763	42
Volume (veh/h)												
Sign Control												
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	33	5	48	2	3	8	67	1099	13	68	820	45
Pedestrians												
Lane Width (ft)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Walking Speed (ft/s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Percent Blockage	1	1	1	1	1	1	1	1	1	1	1	1
Right turn flare (veh)												
Median type												
Median storage (veh)												
Upstream signal (ft)	0.92	0.92	0.92	0.92	0.92	0.88	0.92	0.92	0.88	0.88	0.88	0.88
pX, platoon unblocked	1676	2241	442	1849	2257	567	872	872	1123	1123	1123	1123
vC, conflicting volume												
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1184	1795	223	1371	1812	249	690	690	877	877	877	877
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1	4.1	4.1	4.1	4.1	4.1
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2	2.2	2.2	2.2	2.2
p0 queue free %	69	91	93	97	94	99	92	92	90	90	90	90
cM capacity (veh/h)	108	60	713	72	58	658	826	826	671	671	671	671
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	87	13	67	733	379	68	547	319				
Volume Left	33	2	67	0	0	68	0	0				
Volume Right	48	8	0	0	0	13	0	45				
cSH	187	133	826	1700	1700	671	1700	1700				
Volume to Capacity	0.47	0.10	0.08	0.43	0.22	0.10	0.32	0.19				
Queue Length 95th (ft)	56	8	7	0	0	8	0	0				
Control Delay (s)	40.0	34.8	9.7	0.0	0.0	11.0	0.0	0.0				
Lane LOS	E	D	A	A	A	B	B	B				
Approach Delay (s)	40.0	34.8	0.6			0.8						
Approach LOS	E	D										
<b>Intersection Summary</b>												
Average Delay	2.4											
Intersection Capacity Utilization	52.1%											
ICU Level of Service	A											
Analysis Period (min)	15											

Esplanade Area Complete Street Plan  
PM Preferred Plan with Roundabouts

Synchro 8 Report  
W-Trans



HCM Signalized Intersection Capacity Analysis  
9: Esplanade & 5th Ave

4/26/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations		4		4			4			4	
Volume (vph)	38	79	18	113	66	104	0	747	44	0	837
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95
Flpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	0.98	0.99	1.00	0.85	1.00	0.85	0.99	1.00	0.99	1.00	0.99
Flt Protected	0.99	0.99	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1793	1804	1804	1518	1804	1518	3499	1804	1518	1804	3510
Flt Permitted	0.80	0.65	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	1453	1215	1518	1518	1518	3499	3510	1518	1518	1518	3510
Peak-hour factor, PHF	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Adj. Flow (vph)	54	111	25	159	93	146	0	1052	62	0	1179
RTOR Reduction (vph)	0	7	0	0	0	53	0	4	0	0	3
Lane Group Flow (vph)	0	183	0	0	252	93	0	1110	0	0	1232
Confl. Peds. (#/hr)	14	2	2	2	14	4	4	14	14	14	4
Confl. Bikes (#/hr)	14	14	14	19	19	19	19	19	19	19	9
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	4	4	4	4	4	4	4	4	4	4	2
Permitted Phases	4	4	4	4	4	4	4	4	4	4	2
Actuated Green, G (s)	22.8	22.8	22.8	22.8	22.8	22.8	51.8	22.8	22.8	22.8	51.8
Effective Green, g (s)	23.3	23.3	23.3	23.3	23.3	23.3	52.3	23.3	23.3	23.3	52.3
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.28	0.28	0.62	0.28	0.28	0.28	0.62
Clearance Time (s)	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	403	337	421	2178	421	2178	2185	421	421	421	2185
v/s Ratio Prot							c0.32				c0.35
v/s Ratio Perm	0.13	c0.21	0.06	0.75	0.22	0.51	0.51	0.51	0.51	0.51	0.56
v/c Ratio	25.1	21.7	23.4	8.8	8.8	8.8	9.2	8.8	8.8	8.8	9.2
Uniform Delay, d1	1.00	1.00	1.00	0.76	0.76	0.76	0.21	0.76	0.76	0.76	0.21
Progression Factor	0.8	0.8	0.8	0.3	0.3	0.3	0.8	0.3	0.3	0.3	0.8
Incremental Delay, d2	25.9	36.4	23.6	7.4	7.4	7.4	2.9	7.4	7.4	7.4	2.9
Delay (s)	C	D	C	D	C	D	A	C	C	C	A
Level of Service	C	D	C	D	C	D	A	C	C	C	A
Approach Delay (s)	25.9	31.7	23.6	7.4	7.4	7.4	2.9	7.4	7.4	7.4	2.9
Approach LOS	C	C	C	D	C	D	A	C	C	C	A
<b>Intersection Summary</b>											
HCM 2000 Control Delay	10.0 HCM 2000 Level of Service										
HCM 2000 Volume to Capacity ratio	0.62										
Actuated Cycle Length (s)	84.0 Sum of lost time (s)										
Intersection Capacity Utilization	53.2% ICU Level of Service										
Analysis Period (min)	15										
c. Critical Lane Group											

Esplanade Area Complete Street Plan  
AM Preferred Plan with Roundabouts

Synchro 8 Report  
W-Trans

HCM Signalized Intersection Capacity Analysis  
9: Esplanade & 5th Ave

4/26/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations		4		4			4			4	
Volume (vph)	39	90	13	76	69	106	0	980	71	0	774
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95
Flpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	0.99	0.99	1.00	0.85	1.00	0.85	0.99	1.00	0.99	1.00	0.99
Flt Protected	0.99	0.99	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1804	1804	1808	1510	1808	1510	3492	1804	1510	1804	3521
Flt Permitted	0.88	0.70	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	1602	1305	1510	1510	1510	3492	3521	1510	1510	1510	3521
Peak-hour factor, PHF	0.83	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	42	97	14	82	74	114	0	1054	76	0	832
RTOR Reduction (vph)	0	6	0	0	0	56	0	4	0	0	2
Lane Group Flow (vph)	0	147	0	0	156	58	0	1126	0	0	855
Confl. Peds. (#/hr)	13	10	10	10	13	2	2	12	12	12	2
Confl. Bikes (#/hr)	14	14	14	19	19	19	19	19	19	19	9
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	4	4	4	4	4	4	4	4	4	4	2
Permitted Phases	4	4	4	4	4	4	4	4	4	4	2
Actuated Green, G (s)	14.9	14.9	14.9	14.9	14.9	14.9	55.7	14.9	14.9	14.9	55.7
Effective Green, g (s)	15.4	15.4	15.4	15.4	15.4	15.4	56.2	15.4	15.4	15.4	56.2
Actuated g/C Ratio	0.19	0.19	0.19	0.19	0.19	0.19	0.70	0.19	0.19	0.19	0.70
Clearance Time (s)	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	308	251	290	2463	290	2463	2473	290	290	290	2473
v/s Ratio Prot							c0.32				0.24
v/s Ratio Perm	0.09	c0.12	0.04	0.62	0.20	0.46	0.46	0.46	0.46	0.46	0.35
v/c Ratio	28.7	29.6	27.1	5.2	5.2	4.7	4.7	4.7	4.7	4.7	4.7
Uniform Delay, d1	1.00	1.00	1.00	0.42	0.42	0.42	0.53	0.42	0.42	0.42	0.53
Progression Factor	1.2	1.2	1.2	0.3	0.3	0.3	0.6	0.3	0.3	0.3	0.4
Incremental Delay, d2	29.9	34.3	27.5	2.8	2.8	2.8	2.9	2.8	2.8	2.8	2.9
Delay (s)	C	C	C	C	C	C	A	C	C	C	A
Level of Service	C	C	C	C	C	C	A	C	C	C	A
Approach Delay (s)	29.9	31.4	27.5	2.8	2.8	2.8	2.9	2.8	2.8	2.8	2.9
Approach LOS	C	C	C	C	C	C	A	C	C	C	A
<b>Intersection Summary</b>											
HCM 2000 Control Delay	7.8 HCM 2000 Level of Service										
HCM 2000 Volume to Capacity ratio	0.49										
Actuated Cycle Length (s)	80.0 Sum of lost time (s)										
Intersection Capacity Utilization	63.3% ICU Level of Service										
Analysis Period (min)	15										
c. Critical Lane Group											

Esplanade Area Complete Street Plan  
PM Preferred Plan with Roundabouts

Synchro 8 Report  
W-Trans

HCM Unsignalized Intersection Capacity Analysis  
10: Esplanade & 6th Ave

4/26/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (veh/h)	6	7	42	1	1	7	97	782	10	76	834	39
Sign Control				Stop	Stop				Free			Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	8	10	59	1	1	10	137	1101	14	107	1175	55
Pedestrians		14			12			9			6	
Lane Width (ft)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Walking Speed (ft/s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Percent Blockage	1	1	1	1	1	1	1	1	1	1	1	1
Right turn flare (veh)												
Median type								None				
Median storage (veh)								442				438
Upstream signal (ft)	0.91	0.91	0.83	0.91	0.91	0.84	0.83					0.84
pX, platoon unblocked	2271	2831	638	2268	2851	576	1244					1127
vC, conflicting volume												
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1412	2031	142	1409	2053	123	875					778
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1					4.1
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2					2.2
p0 queue free %	86	70	92	97	96	99	78					85
cM capacity (veh/h)	61	33	713	46	32	751	627					696
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	77	13	137	734	381	107	783	446				
Volume Left	8	1	137	0	0	107	0	0				
Volume Right	69	10	0	0	14	0	0	55				
cSH	149	144	627	1700	1700	696	1700	1700				
Volume to Capacity	0.52	0.09	0.22	0.43	0.22	0.15	0.46	0.26				
Queue Length 95th (ft)	63	7	21	0	0	14	0	0				
Control Delay (s)	52.7	32.3	12.3	0.0	0.0	11.1	0.0	0.0				
Lane LOS	F	D	B	B	B	B	B	B				
Approach Delay (s)	52.7	32.3	1.3		0.9							
Approach LOS	F	D										

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		

Esplanade Area Complete Street Plan  
AM Preferred Plan with Roundabouts

Synchro 8 Report  
W-Trans

HCM Unsignalized Intersection Capacity Analysis  
10: Esplanade & 6th Ave

4/26/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (veh/h)	12	4	56	7	1	20	44	1067	6	56	734	25
Sign Control		Stop		Stop	Stop				Free			Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	13	4	60	8	1	22	47	1147	6	60	789	27
Pedestrians		9		8			6				2	
Lane Width (ft)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Walking Speed (ft/s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Percent Blockage	1	1	1	1	1	1	1	1	1	1	1	1
Right turn flare (veh)												
Median type								None				
Median storage (veh)								442				438
Upstream signal (ft)	0.91	0.91	0.93	0.91	0.91	0.87	0.93					0.87
pX, platoon unblocked	1624	2189	423	1837	2199	587	825					1162
vC, conflicting volume												
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1116	1738	217	1350	1749	227	651					887
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1					4.1
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2					2.2
p0 queue free %	90	94	92	90	98	97	94					91
cM capacity (veh/h)	123	66	720	75	65	670	856					656
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	77	30	47	765	389	60	526	290				
Volume Left	13	8	47	0	0	60	0	0				
Volume Right	60	22	0	0	6	0	0	27				
cSH	305	202	856	1700	1700	656	1700	1700				
Volume to Capacity	0.25	0.15	0.06	0.45	0.23	0.09	0.31	0.17				
Queue Length 95th (ft)	25	13	4	0	0	8	0	0				
Control Delay (s)	20.7	25.9	9.5	0.0	0.0	11.0	0.0	0.0				
Lane LOS	C	D	A	A	B	B	B	B				
Approach Delay (s)	20.7	25.9	0.4		0.8							
Approach LOS	C	D										

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	50.1%	ICU Level of Service	A
Analysis Period (min)	15		

Esplanade Area Complete Street Plan  
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Synchro 8 Report  
W-Trans

HCM Signalized Intersection Capacity Analysis  
11: Esplanade & 7th Ave

4/26/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations											
Volume (vph)	58	58	30	13	41	40	0	773	21	0	905
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Lane Util. Factor	1.00	1.00	1.00	0.99	1.00	1.00	0.95	1.00	1.00	1.00	0.95
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.98	0.97	0.94	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00
Flt Protected	1769	1733	1733	3520	3520	3514	3514	3514	3514	3514	3514
Satd. Flow (prot)	0.78	0.78	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Permitted	1406	1657	1657	3520	3520	3514	3514	3514	3514	3514	3514
Satd. Flow (perm)	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Peak-hour factor, PHF	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Adj. Flow (vph)	82	82	42	18	58	56	0	1089	30	0	1275
RTOR Reduction (vph)	0	14	0	0	38	0	0	1	0	0	2
Lane Group Flow (vph)	0	192	0	0	94	0	0	1118	0	0	1325
Confl. Peds. (#/hr)	4	4	4	4	4	4	3	13	13	13	3
Confl. Bikes (#/hr)	2	2	2	2	2	2	2	13	13	13	8
Turn Type	Perm	NA	NA	Perm	NA	NA	NA	NA	NA	NA	NA
Protected Phases	4	4	4	4	4	4	4	4	4	4	2
Permitted Phases	4	4	4	4	4	4	4	4	4	4	2
Actuated Green, G (s)	16.2	16.2	16.2	16.2	16.2	16.2	58.5	58.5	58.5	58.5	58.5
Effective Green, g (s)	16.7	16.7	16.7	16.7	16.7	16.7	59.0	59.0	59.0	59.0	59.0
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.20	0.20	0.70	0.70	0.70	0.70	0.70
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.7	4.7	4.7	4.7	4.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	279	329	329	329	329	329	2472	2472	2468	2468	2468
v/s Ratio Prot	c0.14	c0.14	0.06	0.06	0.06	0.06	0.32	0.32	c0.38	c0.38	c0.38
v/s Ratio Perm	0.69	0.69	0.28	0.28	0.28	0.45	0.45	0.45	0.54	0.54	0.54
v/c Ratio	31.2	31.2	28.6	28.6	28.6	5.5	5.5	5.5	6.0	6.0	6.0
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.45	1.45	1.45	0.29	0.29	0.29
Progression Factor	0.69	0.69	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.8	0.8
Incremental Delay, d2	38.2	38.2	29.1	29.1	29.1	8.4	8.4	8.4	2.5	2.5	2.5
Delay (s)	D	D	C	C	C	A	A	A	A	A	A
Level of Service	D	D	C	C	C	A	A	A	A	A	A
Approach Delay (s)	38.2	38.2	29.1	29.1	29.1	8.4	8.4	8.4	2.5	2.5	2.5
Approach LOS	D	D	C	C	C	A	A	A	A	A	A
Intersection Summary											
HCM 2000 Control Delay	8.8										
HCM 2000 Level of Service	A										
HCM 2000 Volume to Capacity ratio	0.57										
Actuated Cycle Length (s)	84.0										
Sum of lost time (s)	8.3										
Intersection Capacity Utilization	48.6%										
ICU Level of Service	A										
Analysis Period (min)	15										
c. Critical Lane Group											

Esplanade Area Complete Street Plan  
AM Preferred Plan with Roundabouts

Synchro 8 Report  
W-Trans

HCM Signalized Intersection Capacity Analysis  
11: Esplanade & 7th Ave

4/26/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations											
Volume (vph)	76	50	30	21	26	43	0	1091	10	0	758
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Lane Util. Factor	1.00	1.00	1.00	0.99	1.00	1.00	0.95	1.00	1.00	1.00	0.95
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.98	0.97	0.94	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00
Flt Protected	1763	1763	1709	3533	3533	3515	3515	3515	3515	3515	3515
Satd. Flow (prot)	0.80	0.80	0.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Permitted	1453	1453	1591	3533	3533	3515	3515	3515	3515	3515	3515
Satd. Flow (perm)	0.83	0.83	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	82	54	32	23	28	46	0	1173	11	0	815
RTOR Reduction (vph)	0	14	0	0	37	0	0	1	0	0	2
Lane Group Flow (vph)	0	154	0	0	60	0	0	1183	0	0	841
Confl. Peds. (#/hr)	1	6	6	6	6	1	17	9	9	9	17
Confl. Bikes (#/hr)	2	2	2	2	2	2	22	22	22	22	8
Turn Type	Perm	NA	NA	Perm	NA	NA	NA	NA	NA	NA	NA
Protected Phases	4	4	4	4	4	4	4	4	4	4	2
Permitted Phases	4	4	4	4	4	4	4	4	4	4	2
Actuated Green, G (s)	14.5	14.5	14.5	14.5	14.5	14.5	56.2	56.2	56.2	56.2	56.2
Effective Green, g (s)	15.0	15.0	15.0	15.0	15.0	15.0	56.7	56.7	56.7	56.7	56.7
Actuated g/C Ratio	0.19	0.19	0.19	0.19	0.19	0.19	0.71	0.71	0.71	0.71	0.71
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.7	4.7	4.7	4.7	4.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	272	272	298	298	298	2504	2504	2491	2491	2491	2491
v/s Ratio Prot	c0.11	c0.11	0.04	0.04	0.04	0.33	0.33	0.33	0.24	0.24	0.24
v/s Ratio Perm	0.57	0.57	0.20	0.20	0.20	0.47	0.47	0.47	0.34	0.34	0.34
v/c Ratio	29.5	29.5	27.4	27.4	27.4	5.1	5.1	5.1	4.5	4.5	4.5
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	0.51	0.51	0.51	1.38	1.38	1.38
Progression Factor	2.7	2.7	0.3	0.3	0.3	0.6	0.6	0.6	0.4	0.4	0.4
Incremental Delay, d2	32.2	32.2	27.8	27.8	27.8	3.2	3.2	3.2	6.5	6.5	6.5
Delay (s)	C	C	C	C	C	A	A	A	A	A	A
Level of Service	C	C	C	C	C	A	A	A	A	A	A
Approach Delay (s)	32.2	32.2	27.8	27.8	27.8	3.2	3.2	3.2	6.5	6.5	6.5
Approach LOS	C	C	C	C	C	A	A	A	A	A	A
Intersection Summary											
HCM 2000 Control Delay	7.6										
HCM 2000 Level of Service	A										
HCM 2000 Volume to Capacity ratio	0.49										
Actuated Cycle Length (s)	80.0										
Sum of lost time (s)	8.3										
Intersection Capacity Utilization	53.7%										
ICU Level of Service	A										
Analysis Period (min)	15										
c. Critical Lane Group											

Esplanade Area Complete Street Plan  
PM Preferred Plan with Roundabouts

Synchro 8 Report  
W-Trans

HCM Unsignalized Intersection Capacity Analysis  
12: Esplanade & 8th Ave

4/26/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (veh/h)	34	6	127	2	1	8	144	718	9	41	813	90
Sign Control			Stop			Free		Free			Free	
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	48	8	179	3	1	11	203	1011	13	58	1145	127
Pedestrians	5			7			3					
Lane Width (ft)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Walking Speed (ft/s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Percent Blockage	0	0	0	1	1	0	0	0	0	0	0	0
Right turn flare (veh)												
Median type								None				
Median storage (veh)								434				439
Upstream signal (ft)	0.87	0.87	0.81	0.87	0.87	0.88	0.81					0.88
pX, platoon unblocked	2252	2766	644	2304	2823	519	1277					1031
vC, conflicting volume												
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1545	2135	99	1605	2201	196	879					775
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1					4.1
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2					2.2
p0 queue free %	0	67	76	89	94	98	67					92
cM capacity (veh/h)	44	26	756	25	24	714	619					736
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	235	15	203	674	350	58	763	508				
Volume Left	48	3	203	0	0	58	0	0				
Volume Right	179	11	0	0	13	0	0	127				
cSH	143	82	619	1700	1700	736	1700	1700				
Volume to Capacity	1.64	0.19	0.33	0.40	0.21	0.08	0.45	0.30				
Queue Length 95th (ft)	418	16	36	0	0	6	0	0				
Control Delay (s)	372.0	59.1	13.6	0.0	0.0	10.3	0.0	0.0				
Lane LOS	F	F	B	B	B	B	B	B				
Approach Delay (s)	372.0	59.1	2.3			0.4						
Approach LOS	F	F	F									
<b>Intersection Summary</b>												
Average Delay	32.7											
Intersection Capacity Utilization	57.6%											
Analysis Period (min)	15											
ICU Level of Service	B											

Esplanade Area Complete Street Plan  
AM Preferred Plan with Roundabouts

Synchro 8 Report  
W-Trans

HCM Unsignalized Intersection Capacity Analysis  
12: Esplanade & 8th Ave

4/26/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (veh/h)	30	7	99	1	1	25	225	967	18	38	684	117
Sign Control			Stop			Free		Free			Free	
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	32	8	106	1	1	27	242	1040	19	41	735	126
Pedestrians	12			8			4					
Lane Width (ft)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Walking Speed (ft/s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Percent Blockage	1	1	1	1	1	0	0	0	0	0	0	0
Right turn flare (veh)												
Median type								None				
Median storage (veh)								434				439
Upstream signal (ft)	0.92	0.92	0.92	0.92	0.92	0.88	0.92					0.88
pX, platoon unblocked	1923	2443	447	2105	2496	538	873					1067
vC, conflicting volume												
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1422	1988	215	1620	2046	195	681					798
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1					4.1
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2					2.2
p0 queue free %	46	79	85	97	97	96	71					94
cM capacity (veh/h)	60	36	714	33	33	709	824					715
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	146	29	242	693	366	41	490	371				
Volume Left	32	1	242	0	0	41	0	0				
Volume Right	106	27	0	0	19	0	0	126				
cSH	164	283	824	1700	1700	715	1700	1700				
Volume to Capacity	0.89	0.10	0.29	0.41	0.22	0.06	0.29	0.22				
Queue Length 95th (ft)	159	8	31	0	0	5	0	0				
Control Delay (s)	99.5	19.2	11.2	0.0	0.0	10.3	0.0	0.0				
Lane LOS	F	C	B	B	B	B	B	B				
Approach Delay (s)	99.5	19.2	2.1			0.5						
Approach LOS	F	F	F									
<b>Intersection Summary</b>												
Average Delay	7.7											
Intersection Capacity Utilization	60.4%											
Analysis Period (min)	15											
ICU Level of Service	B											

Esplanade Area Complete Street Plan  
PM Preferred Plan with Roundabouts

Synchro 8 Report  
W-Trans

HCM Signalized Intersection Capacity Analysis  
13: Esplanade & 9th Ave

4/26/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Volume (vph)	58	117	19	91	44	52	0	682	81	0	838
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	1.00	1.00	4.1	4.2	0.95	1.00	0.95	1.00	1.00	0.95
Lane Util. Factor	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.99	0.99	0.96	0.98	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	1807	0.81	1741	0.63	1119	3470	3531	1.00	1.00	1.00	1.00
Satd. Flow (prot)	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Flt Permitted	82	165	27	128	62	73	0	961	114	0	1180
Satd. Flow (perm)	0	6	0	0	20	0	0	8	0	0	1
Peak-hour factor, PHF	0	268	0	0	243	0	0	1067	0	0	1193
Adj. Flow (vph)	3	1	1	1	3	5	5	5	5	5	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	3	1	1	1	3	5	5	5	5	5	5
Confl. Peds. (#/hr)	4	4	4	4	4	4	4	4	4	4	4
Confl. Bikes (#/hr)	4	4	4	4	4	4	4	4	4	4	4
Turn Type	Perm	NA	NA	Perm	NA	NA	NA	NA	NA	NA	NA
Protected Phases	4	4	4	4	4	4	4	4	4	4	4
Permitted Phases	4	4	4	4	4	4	4	4	4	4	4
Actuated Green, G (s)	22.1	22.1	22.1	22.6	22.6	22.6	22.6	22.6	22.6	22.6	22.6
Effective Green, g (s)	22.6	22.6	22.6	22.6	22.6	22.6	22.6	22.6	22.6	22.6	22.6
Actuated g/C Ratio	0.27	0.27	0.27	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	401	301	301	2193	0.31	2193	0.31	2193	0.31	2193	0.31
v/s Ratio Prot	0.18	0.22	0.22	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
v/s Ratio Perm	0.67	0.67	0.67	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
v/c Ratio	27.4	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7
Uniform Delay, d1	1.00	1.00	1.00	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Progression Factor	4.2	14.6	14.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Incremental Delay, d2	31.6	43.3	43.3	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
Delay (s)	C	D	D	A	A	A	A	A	A	A	A
Level of Service	C	D	D	A	A	A	A	A	A	A	A
Approach Delay (s)	31.6	43.3	43.3	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
Approach LOS	C	D	D	A	A	A	A	A	A	A	A
<b>Intersection Summary</b>											
HCM 2000 Control Delay	10.8 HCM 2000 Level of Service										
HCM 2000 Volume to Capacity ratio	0.62 HCM 2000 Level of Service										
Actuated Cycle Length (s)	84.0 Sum of lost time (s)										
Intersection Capacity Utilization	48.2% ICU Level of Service										
Analysis Period (min)	15										
c. Critical Lane Group											

Esplanade Area Complete Street Plan  
AM Preferred Plan with Roundabouts

Synchro 8 Report  
W-Trans

HCM Signalized Intersection Capacity Analysis  
13: Esplanade & 9th Ave

4/26/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Volume (vph)	57	80	6	70	66	55	0	943	80	0	763
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	1.00	1.00	4.1	4.2	0.95	1.00	0.95	1.00	1.00	0.95
Lane Util. Factor	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.99	0.99	0.96	0.98	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	1815	0.76	1749	0.81	1439	3482	3514	1.00	1.00	1.00	1.00
Satd. Flow (prot)	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Flt Permitted	61	86	6	75	71	59	0	1014	86	0	820
Satd. Flow (perm)	0	2	0	0	23	0	0	5	0	0	2
Peak-hour factor, PHF	0	151	0	0	182	0	0	1095	0	0	846
Adj. Flow (vph)	0	0	0	0	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	151	0	0	182	0	0	1095	0	0	846
Confl. Peds. (#/hr)	7	7	7	7	7	7	7	7	7	7	7
Confl. Bikes (#/hr)	7	7	7	7	7	7	7	7	7	7	7
Turn Type	Perm	NA	NA	Perm	NA	NA	NA	NA	NA	NA	NA
Protected Phases	4	4	4	4	4	4	4	4	4	4	4
Permitted Phases	4	4	4	4	4	4	4	4	4	4	4
Actuated Green, G (s)	15.6	15.6	15.6	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.1
Effective Green, g (s)	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.1
Actuated g/C Ratio	0.20	0.20	0.20	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	282	289	289	c0.31	c0.31	c0.31	c0.31	c0.31	c0.31	c0.31	c0.31
v/s Ratio Prot	0.11	0.13	0.13	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
v/s Ratio Perm	0.53	0.53	0.53	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
v/c Ratio	28.6	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2
Uniform Delay, d1	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Progression Factor	1.9	4.2	4.2	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Incremental Delay, d2	30.5	33.5	33.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Delay (s)	C	C	C	A	A	A	A	A	A	A	A
Level of Service	C	C	C	A	A	A	A	A	A	A	A
Approach Delay (s)	30.5	33.5	33.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Approach LOS	C	C	C	A	A	A	A	A	A	A	A
<b>Intersection Summary</b>											
HCM 2000 Control Delay	7.3 HCM 2000 Level of Service										
HCM 2000 Volume to Capacity ratio	0.49 HCM 2000 Level of Service										
Actuated Cycle Length (s)	80.0 Sum of lost time (s)										
Intersection Capacity Utilization	49.3% ICU Level of Service										
Analysis Period (min)	15										
c. Critical Lane Group											

Esplanade Area Complete Street Plan  
PM Preferred Plan with Roundabouts

Synchro 8 Report  
W-Trans

HCM Unsignalized Intersection Capacity Analysis  
14: Esplanade & 10th Ave

4/26/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	3	1	5	2	0	56	8	779	5	102	841	10
Volume (veh/h)												
Sign Control												
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	4	1	7	3	0	79	11	1097	7	144	1185	14
Pedestrians												
Lane Width (ft)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Walking Speed (ft/s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Percent Blockage	1	1	1	1	1	1	1	1	1	1	1	1
Right turn flare (veh)												
Median type												
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked	0.79	0.79	0.71	0.79	0.79	0.85	0.71	0.85	0.71	0.85	0.85	0.85
vC, conflicting volume	2138	2619	607	2016	2622	558	1207	1109	1109	1109	1109	1109
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1034	1646	0	878	1651	122	473	771	771	771	771	771
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1	4.1	4.1	4.1	4.1	4.1
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2	2.2	2.2	2.2	2.2
p0 queue free %	96	98	99	98	100	90	99	80	80	80	80	80
cM capacity (veh/h)	108	60	764	153	60	765	765	709	709	709	709	709
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	13	82	11	731	373	144	790	409				
Volume Left	4	3	11	0	0	144	0	0				
Volume Right	7	79	0	0	7	0	0	14				
cSH	177	672	765	1700	1700	709	1700	1700				
Volume to Capacity	0.07	0.12	0.01	0.43	0.22	0.20	0.46	0.24				
Queue Length 95th (ft)	6	10	1	0	0	19	0	0				
Control Delay (s)	27.0	11.1	9.8	0.0	0.0	11.4	0.0	0.0				
Lane LOS	D	B	A			B						
Approach Delay (s)												
Approach LOS												
<b>Intersection Summary</b>												
Average Delay	1.2											
Intersection Capacity Utilization	41.4%											
ICU Level of Service	A											
Analysis Period (min)	15											

Esplanade Area Complete Street Plan  
AM Preferred Plan with Roundabouts

Synchro 8 Report  
W-Trans

HCM Unsignalized Intersection Capacity Analysis  
14: Esplanade & 10th Ave

4/26/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	3	3	9	4	4	1	45	32	1015	8	69	785
Volume (veh/h)												
Sign Control												
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	3	3	10	4	4	1	48	34	1091	9	74	844
Pedestrians												
Lane Width (ft)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Walking Speed (ft/s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Percent Blockage	2	2	2	2	2	2	2	2	2	2	2	2
Right turn flare (veh)												
Median type												
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked	0.89	0.89	0.83	0.89	0.89	0.87	0.83	0.83	0.87	0.87	0.87	0.87
vC, conflicting volume	1680	2193	447	1755	2194	558	873	873	1108	1108	1108	1108
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	871	1447	0	956	1448	199	428	830	830	830	830	830
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1	4.1	4.1	4.1	4.1	4.1
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2	2.2	2.2	2.2	2.2
p0 queue free %	98	97	99	97	99	93	96	89	89	89	89	89
cM capacity (veh/h)	174	98	882	159	97	701	918	691	691	691	691	691
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	16	54	34	728	372	74	563	291				
Volume Left	3	4	34	0	0	74	0	0				
Volume Right	10	48	0	0	0	0	0	10				
cSH	258	502	918	1700	1700	691	1700	1700				
Volume to Capacity	0.06	0.11	0.04	0.43	0.22	0.11	0.33	0.17				
Queue Length 95th (ft)	5	9	3	0	0	9	0	0				
Control Delay (s)	19.9	13.0	9.1	0.0	0.0	10.8	0.0	0.0				
Lane LOS	C	B	A			B						
Approach Delay (s)												
Approach LOS												
<b>Intersection Summary</b>												
Average Delay	1.0											
Intersection Capacity Utilization	45.8%											
ICU Level of Service	A											
Analysis Period (min)	15											

Esplanade Area Complete Street Plan  
PM Preferred Plan with Roundabouts

Synchro 8 Report  
W-Trans

HCM Signalized Intersection Capacity Analysis  
15: Esplanade & 11th Ave

4/26/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations											
Volume (vph)	185	0	150	0	0	7	76	752	3	0	803
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	10	12	12	10	11	12	12	12	12
Total Lost time (s)	4.1			4.1			4.2	4.2		4.2	4.2
Lane Util. Factor	1.00		1.00	1.00		1.00	0.95	0.95		0.95	0.95
Frb, ped/bikes	0.99		0.99	1.00		1.00	1.00	1.00		1.00	1.00
Fllb, ped/bikes	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	0.94		0.86	1.00		1.00	1.00	1.00		0.99	0.99
Flt Protected	0.97		1.00	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	1685		1590	1590		1711	3536	3479		3479	3479
Flt Permitted	0.82		1.00	1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (perm)	1425		1590	1590		1711	3536	3479		3479	3479
Peak-hour factor, PHF	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Adj. Flow (vph)	261	0	211	0	0	10	107	1059	4	0	1131
RTOR Reduction (vph)	0	56	0	0	7	0	0	0	0	0	8
Lane Group Flow (vph)	0	416	0	0	3	0	107	1063	0	0	1234
Confl. Peds. (#/hr)	6	6	6	6	6	6	7	7	7	7	7
Confl. Bikes (#/hr)	8	8	8	8	8	8	34	34	34	34	34
Turn Type	Perm	NA	NA	NA	NA	NA	Prot	NA	NA	NA	NA
Protected Phases	4			8			5	2			6
Permitted Phases	4			8			5	2			6
Actuated Green, G (s)	27.3		27.3	27.3		6.5	47.4	36.2			36.2
Effective Green, g (s)	27.8		27.8	27.8		7.0	47.9	36.7			36.7
Actuated g/C Ratio	0.33		0.33	0.33		0.08	0.57	0.44			0.44
Clearance Time (s)	4.6		4.6	4.6		4.7	4.7	4.7			4.7
Vehicle Extension (s)	4.0		2.0	2.0		0.5	4.0	4.0			4.0
Lane Grp Cap (vph)	471		526	526		142	2016	1519			1519
v/s Ratio Prot	0.00		0.00	0.00		0.006	0.30	0.35			0.35
v/s Ratio Perm	0.29		0.88	0.01		0.75	0.53	0.81			0.81
v/c Ratio	0.88		26.6	18.8		37.7	11.1	20.6			20.6
Uniform Delay, d1	1.00		1.00	1.00		0.99	1.10	1.00			1.00
Progression Factor	1.00		1.00	1.00		1.00	0.99	1.00			1.00
Incremental Delay, d2	18.0		18.0	18.8		16.5	0.9	4.8			4.8
Delay (s)	44.6		44.6	44.6		53.8	13.1	25.5			25.5
Level of Service	D		D	B		D	B	C			C
Approach Delay (s)	44.6		44.6	18.8		16.9	16.9	25.5			25.5
Approach LOS	D		D	B		B	B	C			C
Intersection Summary											
HCM 2000 Control Delay	25.1 HCM 2000 Level of Service C										
HCM 2000 Volume to Capacity ratio	0.83										
Actuated Cycle Length (s)	84.0 Sum of lost time (s) 12.5										
Intersection Capacity Utilization	65.7% ICU Level of Service C										
Analysis Period (min)	15										
c Critical Lane Group											

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AM Preferred Plan with Roundabouts

Synchro 8 Report  
W-Trans

HCM Signalized Intersection Capacity Analysis  
15: Esplanade & 11th Ave

4/26/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations											
Volume (vph)	121	0	91	1	2	4	153	903	0	0	777
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	10	12	12	10	11	12	12	12	12
Total Lost time (s)	4.1			4.1			4.2	4.2		4.2	4.2
Lane Util. Factor	1.00		1.00	1.00		1.00	0.95	0.95		0.95	0.95
Frb, ped/bikes	0.99		0.99	1.00		1.00	1.00	1.00		1.00	0.99
Fllb, ped/bikes	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	0.94		0.92	1.00		1.00	1.00	1.00		0.97	0.97
Flt Protected	0.97		0.99	0.99		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	1688		1691	1691		1711	3539	3412		3412	3412
Flt Permitted	0.82		1.00	1.00		0.96	1.00	1.00		1.00	1.00
Satd. Flow (perm)	1423		1642	1642		1711	3539	3412		3412	3412
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	130	0	98	1	2	4	165	971	0	0	835
RTOR Reduction (vph)	0	70	0	0	3	0	0	0	0	0	18
Lane Group Flow (vph)	0	158	0	0	4	0	165	971	0	0	993
Confl. Peds. (#/hr)	1	1	2	2	2	1	5	23	23	23	5
Confl. Bikes (#/hr)	8	8	8	8	8	2	34	34	34	34	43
Turn Type	Perm	NA	NA	NA	NA	NA	Prot	NA	NA	NA	NA
Protected Phases	4			8			5	2			6
Permitted Phases	4			8			5	2			6
Actuated Green, G (s)	15.0		15.0	15.0		12.3	55.7	38.7			38.7
Effective Green, g (s)	15.5		15.5	15.5		12.8	56.2	39.2			39.2
Actuated g/C Ratio	0.19		0.19	0.19		0.16	0.70	0.49			0.49
Clearance Time (s)	4.6		4.6	4.6		4.7	4.7	4.7			4.7
Vehicle Extension (s)	4.0		2.0	2.0		0.5	4.0	4.0			4.0
Lane Grp Cap (vph)	275		318	318		273	2486	1671			1671
v/s Ratio Prot	0.00		0.00	0.00		0.010	0.27	0.29			0.29
v/s Ratio Perm	0.11		0.57	0.01		0.60	0.39	0.59			0.59
v/c Ratio	0.57		29.3	26.1		31.2	4.9	14.7			14.7
Uniform Delay, d1	1.00		1.00	1.00		0.80	0.56	1.00			1.00
Progression Factor	1.00		1.00	1.00		1.00	0.80	0.56			0.56
Incremental Delay, d2	3.4		3.4	0.0		2.4	0.4	1.6			1.6
Delay (s)	32.7		32.7	26.1		27.3	3.1	16.2			16.2
Level of Service	C		C	C		C	A	B			B
Approach Delay (s)	32.7		32.7	26.1		26.1	6.6	16.2			16.2
Approach LOS	C		C	C		C	A	B			B
Intersection Summary											
HCM 2000 Control Delay	13.3 HCM 2000 Level of Service B										
HCM 2000 Volume to Capacity ratio	0.59										
Actuated Cycle Length (s)	80.0 Sum of lost time (s) 12.5										
Intersection Capacity Utilization	64.8% ICU Level of Service C										
Analysis Period (min)	15										
c Critical Lane Group											

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