



Addendum to Traffic Impact Analysis

for

Port Marigny Site Mandeville, LA

(St. Tammany Parish
Mandeville, LA)

Prepared For

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PURPOSE

This addendum addresses the viability of staging the development of Port Marigny based on the fraction of generated trips that the existing street system will presently accommodate. Analysis is based on the CLURO requirements applied to the following scenarios:

1. No Monroe/E. Causeway Approach intersection improvements – this scenario identifies the trip generation threshold for no intersection improvements with and without, the Mariners Blvd. connection.
2. With Improvements to the Monroe/E. Causeway Approach intersection - this scenario identifies the trip generation threshold without the Mariners Blvd. connection and with the following recommended improvements:
 - A. The addition of a right and/or left turn lane on the East Causeway southbound approach; or
 - B. The addition of a left turn lane on the Monroe Street westbound approach.

In making this analysis, the trip distribution pattern without the Mariners Blvd. connection necessitates that all the 'West' entering and exiting trips accessing the Port Marigny site do so via Monroe Street. All other trip distributions should remain the same. Under these assumptions, potential impacts to the affected 2-way stop controlled intersections on Monroe Street have been assessed, with particular emphasis on the ICU (Intersection Capacity Utilization) results.

TRIP DISTRIBUTION

The following maps, **Figures 1A and 1B**, show the entering and exiting trip distribution patterns **with** the Mariners Blvd. connection. These patterns were used for the TIA Report dated 12/9/2015. The maps shown in **Figures 2A and 2B** are the entering and exiting trip distribution patterns **without** the Mariners Blvd. connection.



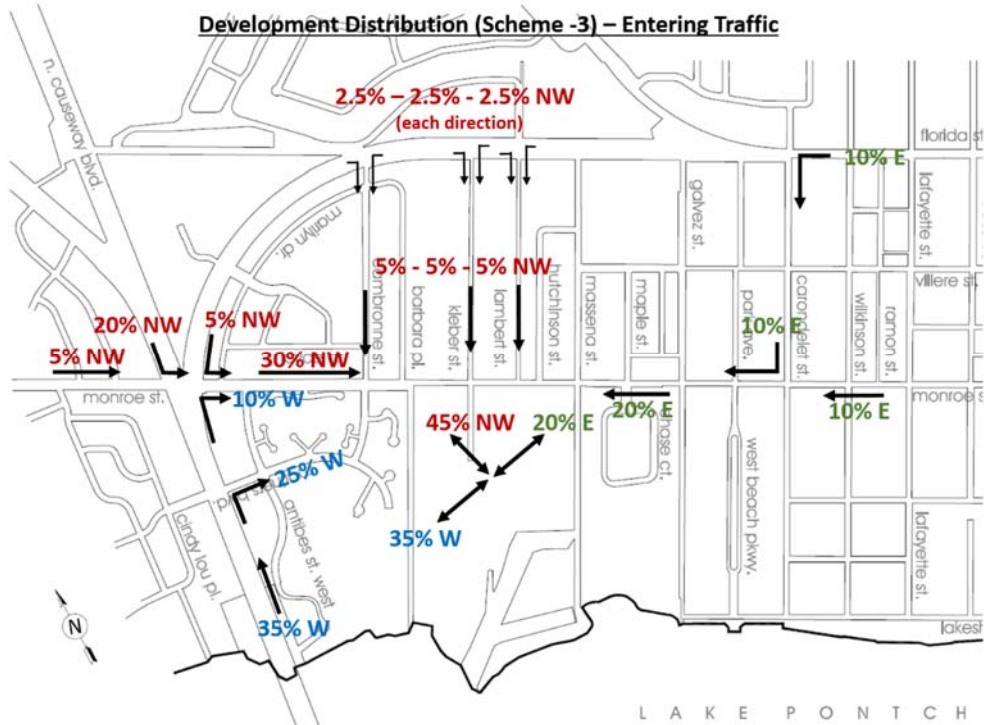


Figure 1A. Trip Distribution Patterns with Mariners Blvd. Connection

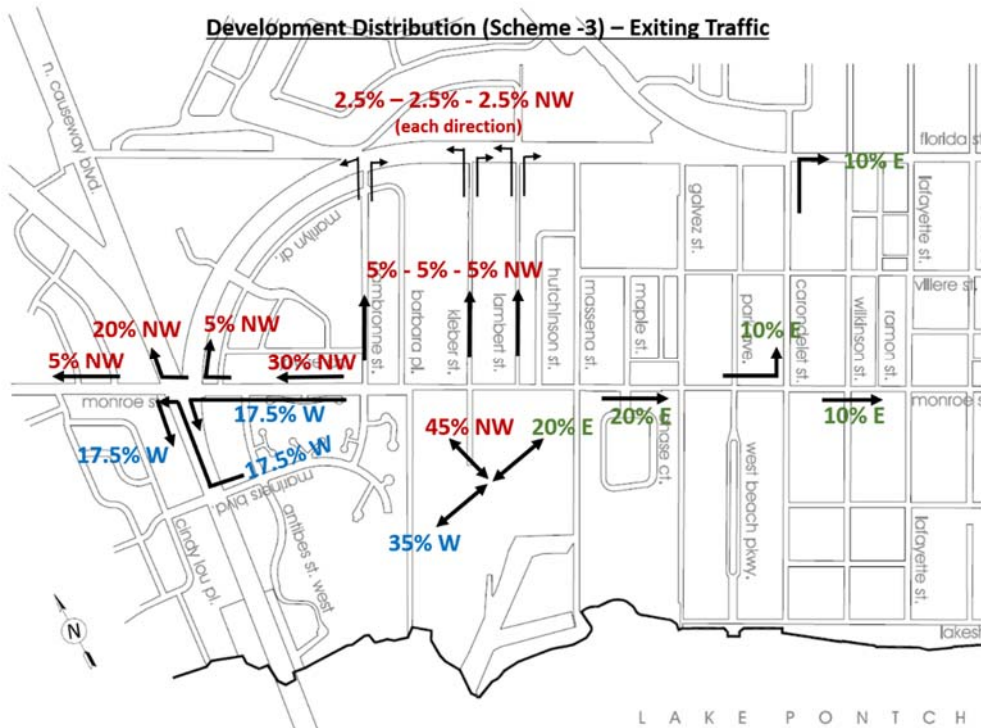


Figure 1B. Trip Distribution Patterns with Mariners Blvd. Connection



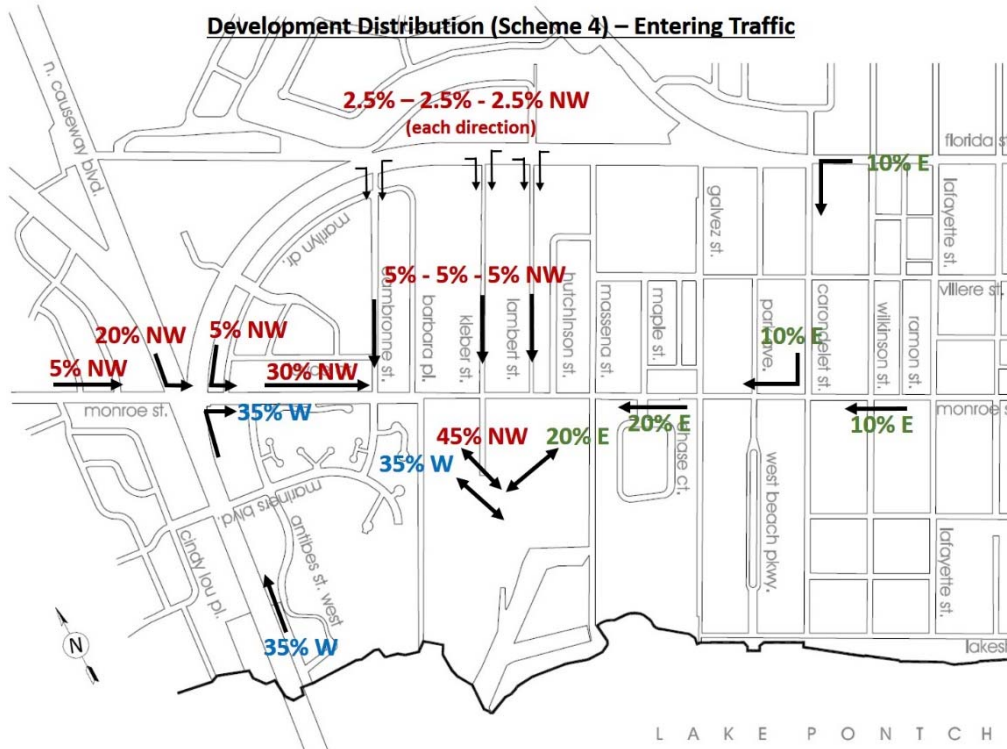


Figure 2A. Trip Distribution Patterns without Mariners Blvd. Connection

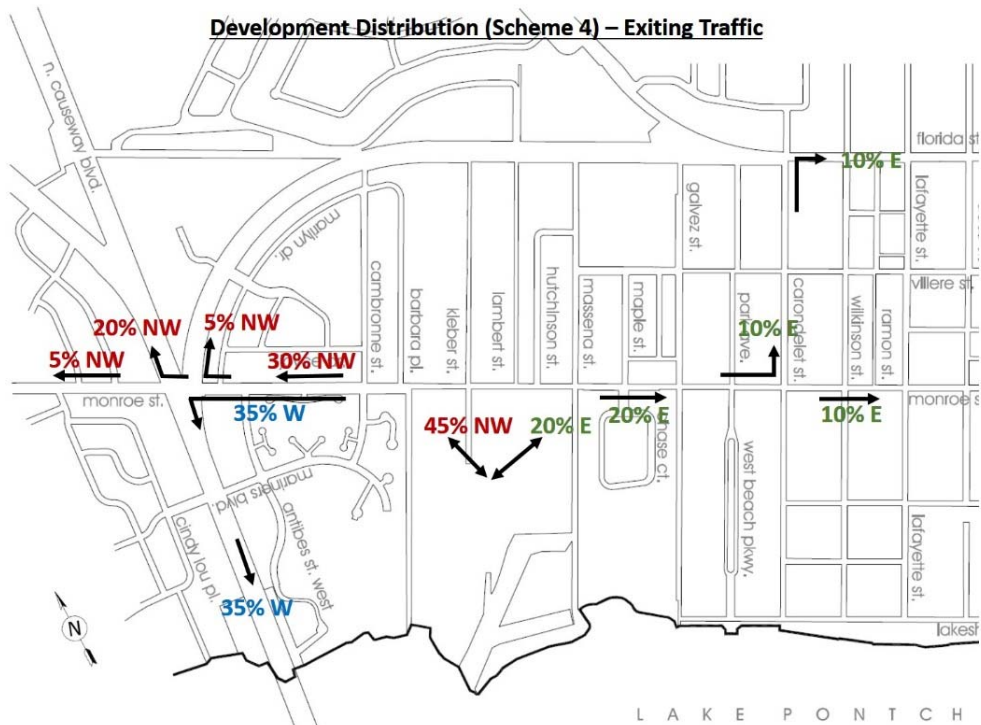


Figure 2B. Trip Distribution Patterns without Mariners Blvd. Connection



Methodology

To test the thresholds, external trips are loaded onto surrounding street networks using a percentage of the entering and exiting trips for the two distribution schemes above. Beginning with the 50% threshold, each scenario was tested and incrementally adjusted, adding 5% increments, until the Monroe Street – East Causeway Approach signalized intersection failed to meet the required Level of Service (LOS) ‘D’ for any lane group. In addition other study area intersections are evaluated at the 50% and higher levels to assess potential impacts beyond the levels documented in the TIA Report. Emphasis is placed on the resulting ICU values.

Results

1. Assuming No intersection improvements

- A. With the Mariners Blvd. connection and no improvements to the Monroe Street – East Causeway Approach intersection, the intersection performs adequately up to **30%** build out of Port Marigny. Above 30% buildout, the southbound (SB) left turn movement drops to LOS ‘E’.
- B. Without the Mariners Blvd. connection and no improvements to the Monroe Street – East Causeway Approach intersection, the intersection performs adequately up to **25%** build out. Above 25% build out, the SB left turn drops to LOS ‘E’.

In each of the scenarios above, the LOS drop occurs because SB right and left turns are shared with the through lanes, thereby causing excessive delay for the SB approach and requiring more green time from the signal. The SB right lane group currently operates at LOS ‘E’ and is an existing condition. That is to say, Port Marigny development does not cause the LOS for the right turn from Southbound East Causeway to slip to “E” – it is already at that LOS.

Unlike the northbound approach that has exclusive left and right turn lanes, the SB approach was not designed to accommodate today’s current traffic and patterns. Thus, even though the SB left turn movement is independent of the Mariner Blvd. connection, adding just a few additional vehicles results in LOS ‘E’ with 35% and 30% build out, respectively.

2. Assuming Construction of Recommended Intersection Improvements without the Mariners Blvd. Connection

- A. Assuming the SB right turn lane is added to accommodate East Causeway southbound traffic and there is no Mariner’s Boulevard connection, the intersection will perform adequately up to **30%** build out, a 5% additional benefit compared to the ‘no-improvement’ scenario.



The addition of a SB left turn lane only allows the intersection to perform adequately up to **25% build out**, providing no additional benefit compared to the 'no-improvement' scenario.

The addition of both the SB left turn lane and the SB right turn lane allows the intersection to perform adequately up to **100% build out**. In this case, the green time is lowered because more lanes can carry the same vehicles in less time.

- B. The addition of a WB left turn lane lowers the WB green time needed, thus allowing the intersection to perform adequately up to **100% build out**. Both A & B perform well because the traffic signal green time is reallocated according to the additional intersection lanes constructed.

Figure 3 below depicts the results in chart form:

NO-MARINERS CONNECTION										
Percent Build Out	25%	30%	35%	40%	50%	60%	70%	80%	90%	100%
NO IMPROVEMENTS	OK	NG	NG	NG	NG	NG	NG	NG	NG	NG
SBRTL	OK	OK	NG	NG	NG	NG	NG	NG	NG	NG
SBLTL	OK	NG	NG	NG	NG	NG	NG	NG	NG	NG
SBRTL+SBLTL	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
WBLTL	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK



















Figure 3. Staging Results without Mariners Blvd. Connection



















In summary, the addition of the recommended improvements (see TIA Report dated 12-9-2015) to the signalized intersection will accommodate 100% of the development trips, with or without the Mariners Blvd. connection. Additionally, the intersections with Monroe Street at Cambronne, Kleber, Lambert and Massena were evaluated at the 100% level without the Mariners Blvd. connection to assess potential impacts beyond the levels documented in the TIA Report. In each case, these Monroe Street intersections will operate at about 50% intersection capacity utilization or better, a high quality of service equivalent to a LOS of 'A' for Monroe Street vehicular movement, consistent with the TIA report findings (see Appendix C, TIA Report dated 12/9/2015).







































APPENDIX

SUPPORTING OPERATIONAL ANALYSIS REPORTS (SYNCHRO)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	260	3	153	366	12	55	83	13	15	717	223
Future Volume (veh/h)	93	260	3	153	366	12	55	83	13	15	717	223
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	116	325	4	187	446	15	63	95	15	17	824	256
Adj No. of Lanes	0	2	0	0	2	0	1	2	1	0	2	0
Peak Hour Factor	0.80	0.80	0.80	0.82	0.82	0.82	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	146	436	6	221	561	19	201	1625	725	42	861	265
Arrive On Green	0.16	0.16	0.16	0.22	0.22	0.22	0.07	0.46	0.46	0.33	0.33	0.33
Sat Flow, veh/h	911	2727	35	1007	2563	89	1774	3539	1578	25	2586	795
Grp Volume(v), veh/h	231	0	214	337	0	311	63	95	15	596	0	501
Grp Sat Flow(s),veh/h/ln	1817	0	1856	1812	0	1846	1774	1770	1578	1851	0	1555
Q Serve(g_s), s	13.6	0.0	12.1	19.8	0.0	17.6	2.4	1.7	0.6	16.0	0.0	35.2
Cycle Q Clear(g_c), s	13.6	0.0	12.1	19.8	0.0	17.6	2.4	1.7	0.6	35.2	0.0	35.2
Prop In Lane	0.50		0.02	0.56		0.05	1.00		1.00	0.03		0.51
Lane Grp Cap(c), veh/h	290	0	297	397	0	404	201	1625	725	650	0	518
V/C Ratio(X)	0.80	0.00	0.72	0.85	0.00	0.77	0.31	0.06	0.02	0.92	0.00	0.97
Avail Cap(c_a), veh/h	442	0	451	473	0	482	201	1625	725	650	0	518
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	44.9	0.0	44.3	41.6	0.0	40.7	25.9	16.7	16.4	36.4	0.0	36.4
Incr Delay (d2), s/veh	5.8	0.0	3.3	11.8	0.0	6.3	0.9	0.0	0.0	18.0	0.0	31.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	0.0	6.5	11.2	0.0	9.7	1.2	0.8	0.3	21.1	0.0	19.5
LnGrp Delay(d),s/veh	50.7	0.0	47.6	53.4	0.0	47.0	26.8	16.7	16.4	54.4	0.0	67.6
LnGrp LOS	D		D	D		D	C	B	B	D		E
Approach Vol, veh/h		445			648			173			1097	
Approach Delay, s/veh		49.2			50.3			20.3			60.4	
Approach LOS		D			D			C			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		57.0		23.8	14.0	43.0		30.3				
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s		51.0		27.0	8.0	37.0		29.0				
Max Q Clear Time (g_c+I1), s		3.7		15.6	4.4	37.2		21.8				
Green Ext Time (p_c), s		9.3		1.4	0.0	0.0		2.3				
Intersection Summary												
HCM 2010 Ctrl Delay				52.6								
HCM 2010 LOS				D								

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	262	3	155	369	13	57	83	14	16	717	223
Future Volume (veh/h)	93	262	3	155	369	13	57	83	14	16	717	223
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	116	328	4	189	450	16	66	95	16	18	824	256
Adj No. of Lanes	0	2	0	0	2	0	1	2	1	0	2	0
Peak Hour Factor	0.80	0.80	0.80	0.82	0.82	0.82	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	145	439	6	222	564	21	199	1620	722	42	858	264
Arrive On Green	0.16	0.16	0.16	0.22	0.22	0.22	0.07	0.46	0.46	0.33	0.33	0.33
Sat Flow, veh/h	905	2734	35	1007	2557	94	1774	3539	1578	27	2584	794
Grp Volume(v), veh/h	233	0	215	340	0	315	66	95	16	597	0	501
Grp Sat Flow(s),veh/h/ln	1817	0	1856	1812	0	1845	1774	1770	1578	1850	0	1555
Q Serve(g_s), s	13.8	0.0	12.3	20.1	0.0	17.9	2.5	1.7	0.6	16.7	0.0	35.4
Cycle Q Clear(g_c), s	13.8	0.0	12.3	20.1	0.0	17.9	2.5	1.7	0.6	35.4	0.0	35.4
Prop In Lane	0.50		0.02	0.56		0.05	1.00		1.00	0.03		0.51
Lane Grp Cap(c), veh/h	292	0	298	399	0	407	199	1620	722	647	0	516
V/C Ratio(X)	0.80	0.00	0.72	0.85	0.00	0.77	0.33	0.06	0.02	0.92	0.00	0.97
Avail Cap(c_a), veh/h	440	0	450	472	0	480	199	1620	722	647	0	516
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	45.0	0.0	44.4	41.7	0.0	40.8	26.1	16.8	16.6	36.6	0.0	36.7
Incr Delay (d2), s/veh	6.0	0.0	3.3	12.3	0.0	6.5	1.0	0.0	0.0	18.7	0.0	32.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	0.0	6.5	11.4	0.0	9.8	1.2	0.8	0.3	21.4	0.0	19.8
LnGrp Delay(d),s/veh	51.0	0.0	47.7	54.0	0.0	47.4	27.1	16.9	16.6	55.4	0.0	68.9
LnGrp LOS	D		D	D		D	C	B	B	E		E
Approach Vol, veh/h		448			655			177			1098	
Approach Delay, s/veh		49.5			50.8			20.6			61.5	
Approach LOS		D			D			C			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		57.0		23.9	14.0	43.0		30.6				
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s		51.0		27.0	8.0	37.0		29.0				
Max Q Clear Time (g_c+I1), s		3.7		15.8	4.5	37.4		22.1				
Green Ext Time (p_c), s		9.3		1.4	0.0	0.0		2.3				
Intersection Summary												
HCM 2010 Ctrl Delay			53.3									
HCM 2010 LOS			D									

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	258	3	162	362	11	41	83	22	15	717	223
Future Volume (veh/h)	93	258	3	162	362	11	41	83	22	15	717	223
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	116	322	4	198	441	13	47	95	25	17	824	256
Adj No. of Lanes	0	2	0	0	2	0	1	2	1	0	2	0
Peak Hour Factor	0.80	0.80	0.80	0.82	0.82	0.82	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	146	433	6	233	555	17	201	1625	724	42	861	265
Arrive On Green	0.16	0.16	0.16	0.22	0.22	0.22	0.07	0.46	0.46	0.33	0.33	0.33
Sat Flow, veh/h	917	2721	35	1059	2522	77	1774	3539	1578	25	2586	795
Grp Volume(v), veh/h	230	0	212	338	0	314	47	95	25	596	0	501
Grp Sat Flow(s),veh/h/ln	1817	0	1856	1810	0	1849	1774	1770	1578	1851	0	1555
Q Serve(g_s), s	13.5	0.0	12.1	19.9	0.0	17.7	1.7	1.7	1.0	16.0	0.0	35.2
Cycle Q Clear(g_c), s	13.5	0.0	12.1	19.9	0.0	17.7	1.7	1.7	1.0	35.2	0.0	35.2
Prop In Lane	0.50		0.02	0.59		0.04	1.00		1.00	0.03		0.51
Lane Grp Cap(c), veh/h	289	0	295	398	0	407	201	1625	724	650	0	518
V/C Ratio(X)	0.80	0.00	0.72	0.85	0.00	0.77	0.23	0.06	0.03	0.92	0.00	0.97
Avail Cap(c_a), veh/h	442	0	451	472	0	483	201	1625	724	650	0	518
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	45.0	0.0	44.4	41.6	0.0	40.7	25.7	16.7	16.5	36.4	0.0	36.5
Incr Delay (d2), s/veh	5.7	0.0	3.3	12.0	0.0	6.4	0.6	0.0	0.0	18.1	0.0	31.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	0.0	6.5	11.3	0.0	9.8	0.9	0.8	0.4	21.2	0.0	19.5
LnGrp Delay(d),s/veh	50.6	0.0	47.7	53.6	0.0	47.1	26.3	16.7	16.5	54.5	0.0	67.7
LnGrp LOS	D		D	D		D	C	B	B	D		E
Approach Vol, veh/h		442			652			167			1097	
Approach Delay, s/veh		49.2			50.5			19.4			60.5	
Approach LOS		D			D			B			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		57.0		23.7	14.0	43.0		30.4				
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s		51.0		27.0	8.0	37.0		29.0				
Max Q Clear Time (g_c+I1), s		3.7		15.5	3.7	37.2		21.9				
Green Ext Time (p_c), s		9.4		1.4	0.0	0.0		2.3				
Intersection Summary												
HCM 2010 Ctrl Delay				52.7								
HCM 2010 LOS				D								

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	260	3	167	366	12	41	83	24	15	717	223
Future Volume (veh/h)	93	260	3	167	366	12	41	83	24	15	717	223
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	116	325	4	204	446	15	47	95	28	17	824	256
Adj No. of Lanes	0	2	0	0	2	0	1	2	1	0	2	0
Peak Hour Factor	0.80	0.80	0.80	0.82	0.82	0.82	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	145	435	6	238	557	19	199	1616	721	42	856	263
Arrive On Green	0.16	0.16	0.16	0.22	0.22	0.22	0.07	0.46	0.46	0.33	0.33	0.33
Sat Flow, veh/h	911	2727	35	1070	2500	87	1774	3539	1578	25	2585	795
Grp Volume(v), veh/h	231	0	214	345	0	320	47	95	28	596	0	501
Grp Sat Flow(s),veh/h/ln	1817	0	1856	1809	0	1847	1774	1770	1578	1851	0	1555
Q Serve(g_s), s	13.7	0.0	12.2	20.5	0.0	18.2	1.8	1.7	1.1	16.3	0.0	35.5
Cycle Q Clear(g_c), s	13.7	0.0	12.2	20.5	0.0	18.2	1.8	1.7	1.1	35.5	0.0	35.5
Prop In Lane	0.50		0.02	0.59		0.05	1.00		1.00	0.03		0.51
Lane Grp Cap(c), veh/h	290	0	296	403	0	411	199	1616	721	646	0	515
V/C Ratio(X)	0.80	0.00	0.72	0.86	0.00	0.78	0.24	0.06	0.04	0.92	0.00	0.97
Avail Cap(c_a), veh/h	439	0	449	470	0	480	199	1616	721	646	0	515
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	45.2	0.0	44.6	41.7	0.0	40.8	25.9	16.9	16.8	36.8	0.0	36.8
Incr Delay (d2), s/veh	5.9	0.0	3.3	13.0	0.0	6.9	0.6	0.0	0.0	18.9	0.0	32.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	0.0	6.5	11.7	0.0	10.0	0.9	0.8	0.5	21.4	0.0	19.8
LnGrp Delay(d),s/veh	51.1	0.0	47.9	54.7	0.0	47.7	26.5	17.0	16.8	55.7	0.0	69.3
LnGrp LOS	D		D	D		D	C	B	B	E		E
Approach Vol, veh/h		445			665			170			1097	
Approach Delay, s/veh		49.6			51.3			19.6			61.9	
Approach LOS		D			D			B			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		57.0		23.8	14.0	43.0		30.9				
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s		51.0		27.0	8.0	37.0		29.0				
Max Q Clear Time (g_c+I1), s		3.7		15.7	3.8	37.5		22.5				
Green Ext Time (p_c), s		9.4		1.4	0.0	0.0		2.2				
Intersection Summary												
HCM 2010 Ctrl Delay			53.6									
HCM 2010 LOS			D									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	285	3	231	412	21	41	83	59	20	717	223
Future Volume (veh/h)	93	285	3	231	412	21	41	83	59	20	717	223
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	116	356	4	282	502	26	47	95	68	23	824	256
Adj No. of Lanes	0	2	0	0	2	0	1	2	1	1	2	1
Peak Hour Factor	0.80	0.80	0.80	0.82	0.82	0.82	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	146	478	6	316	604	32	224	1389	619	381	908	406
Arrive On Green	0.17	0.17	0.17	0.26	0.26	0.26	0.08	0.39	0.39	0.26	0.26	0.26
Sat Flow, veh/h	853	2791	32	1210	2310	123	1774	3539	1577	1212	3539	1583
Grp Volume(v), veh/h	247	0	229	420	0	390	47	95	68	23	824	256
Grp Sat Flow(s),veh/h/ln	1820	0	1857	1802	0	1840	1774	1770	1577	1212	1770	1583
Q Serve(g_s), s	13.4	0.0	12.0	23.1	0.0	20.5	1.8	1.7	2.8	1.5	23.2	14.8
Cycle Q Clear(g_c), s	13.4	0.0	12.0	23.1	0.0	20.5	1.8	1.7	2.8	1.5	23.2	14.8
Prop In Lane	0.47		0.02	0.67		0.07	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	312	0	318	471	0	481	224	1389	619	381	908	406
V/C Ratio(X)	0.79	0.00	0.72	0.89	0.00	0.81	0.21	0.07	0.11	0.06	0.91	0.63
Avail Cap(c_a), veh/h	477	0	487	507	0	518	224	1408	628	388	927	415
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.9	0.0	40.3	36.6	0.0	35.7	25.5	19.5	19.9	29.0	37.1	34.0
Incr Delay (d2), s/veh	5.2	0.0	3.0	17.0	0.0	8.9	0.5	0.0	0.1	0.1	12.3	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	0.0	6.4	13.7	0.0	11.6	0.9	0.8	1.2	0.5	12.9	6.8
LnGrp Delay(d),s/veh	46.1	0.0	43.4	53.6	0.0	44.5	26.0	19.6	19.9	29.1	49.4	36.9
LnGrp LOS	D		D	D		D	C	B	B	C	D	D
Approach Vol, veh/h		476			810			210			1103	
Approach Delay, s/veh		44.8			49.2			21.1			46.1	
Approach LOS		D			D			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		46.4		23.7	14.0	32.4		32.9				
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s		41.0		27.0	8.0	27.0		29.0				
Max Q Clear Time (g_c+I1), s		4.8		15.4	3.8	25.2		25.1				
Green Ext Time (p_c), s		8.3		1.5	0.0	1.2		1.8				
Intersection Summary												
HCM 2010 Ctrl Delay				44.8								
HCM 2010 LOS				D								

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	285	3	231	412	21	41	83	59	20	717	223
Future Volume (veh/h)	93	285	3	231	412	21	41	83	59	20	717	223
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	116	356	4	282	502	26	47	95	68	23	824	256
Adj No. of Lanes	0	2	0	1	2	0	1	2	1	0	2	0
Peak Hour Factor	0.80	0.80	0.80	0.82	0.82	0.82	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	144	471	5	357	688	36	206	1648	735	47	868	267
Arrive On Green	0.17	0.17	0.17	0.20	0.20	0.20	0.07	0.47	0.47	0.34	0.34	0.34
Sat Flow, veh/h	853	2791	32	1774	3423	177	1774	3539	1578	38	2570	789
Grp Volume(v), veh/h	247	0	229	282	259	269	47	95	68	598	0	505
Grp Sat Flow(s),veh/h/ln	1820	0	1857	1774	1770	1830	1774	1770	1578	1842	0	1556
Q Serve(g_s), s	14.3	0.0	12.8	16.5	15.0	15.1	1.7	1.6	2.6	18.1	0.0	34.8
Cycle Q Clear(g_c), s	14.3	0.0	12.8	16.5	15.0	15.1	1.7	1.6	2.6	34.8	0.0	34.8
Prop In Lane	0.47		0.02	1.00		0.10	1.00		1.00	0.04		0.51
Lane Grp Cap(c), veh/h	307	0	313	357	356	368	206	1648	735	656	0	526
V/C Ratio(X)	0.81	0.00	0.73	0.79	0.73	0.73	0.23	0.06	0.09	0.91	0.00	0.96
Avail Cap(c_a), veh/h	449	0	458	470	469	485	206	1650	736	657	0	526
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	43.7	0.0	43.1	41.5	40.9	40.9	25.0	16.0	16.3	35.4	0.0	35.5
Incr Delay (d2), s/veh	6.7	0.0	3.3	6.6	3.9	3.9	0.6	0.0	0.1	17.0	0.0	29.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.8	0.0	6.8	8.7	7.7	8.0	0.9	0.8	1.2	20.7	0.0	19.2
LnGrp Delay(d),s/veh	50.4	0.0	46.4	48.1	44.8	44.8	25.6	16.1	16.4	52.4	0.0	64.9
LnGrp LOS	D		D	D	D	D	C	B	B	D		E
Approach Vol, veh/h		476			810			210			1103	
Approach Delay, s/veh		48.5			46.0			18.3			58.1	
Approach LOS		D			D			B			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		56.9		24.4	14.0	42.9		28.0				
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s		51.0		27.0	8.0	37.0		29.0				
Max Q Clear Time (g_c+I1), s		4.6		16.3	3.7	36.8		18.5				
Green Ext Time (p_c), s		9.7		1.5	0.0	0.1		3.1				
Intersection Summary												
HCM 2010 Ctrl Delay				49.4								
HCM 2010 LOS				D								