Traf Tech
ENGINEERING, INC.

Mr. Keven Klopp – Director
Development Services
City of Hallandale Beach
400 South Federal Highway
Hallandale Beach, Florida 33009

May 11, 2016

Re: Supplemental Traffic Evaluation – Without Hibiscus Street
Chateau Square – Hallandale Beach, Florida

Dear Keven:

Attached are the sections of the traffic study that changed as a result of not providing the Hibiscus Street connection from NE 8th Avenue to NE 10th Avenue/Gulfstream Way. The deletion of the subject roadway section affects the intersection of four (4) public streets (US 1/Hallandale Beach Boulevard, US 1/SE 3rd Street, Hallandale Beach Boulevard/NE 8th Avenue and Hallandale Beach Boulevard/NE 10th Avenue). Additionally, three intersections within the project site are also affected (NE Residential Driveway on NE 8th Avenue, SE Commercial Driveway on NE 8th Avenue and the elimination of the intersection of NE 8th Avenue and Hibiscus Street – this last one becomes a 90-degree turn). The intersection of NE 10th Avenue/Gulfstream Way and Hibiscus Street is also eliminated with the deletion of the Hibiscus Street connection.

Figures 1 and 2 on the following pages document the re-routed traffic volumes during the AM and PM peak hours as a result of the elimination of the Hibiscus Street connection. The figures also present a comparison between three scenarios (with Hibiscus Street, without Hibiscus Street – no valet service and without Hibiscus Street – with valet service).

It is important to note that without the Hibiscus connection, an additional exit lane was added in the northbound direction of NE 8th Avenue approaching Hallandale Beach Boulevard in order to provide additional egress capacity.

Please give me a call if you have any questions relative to the information provided herein.

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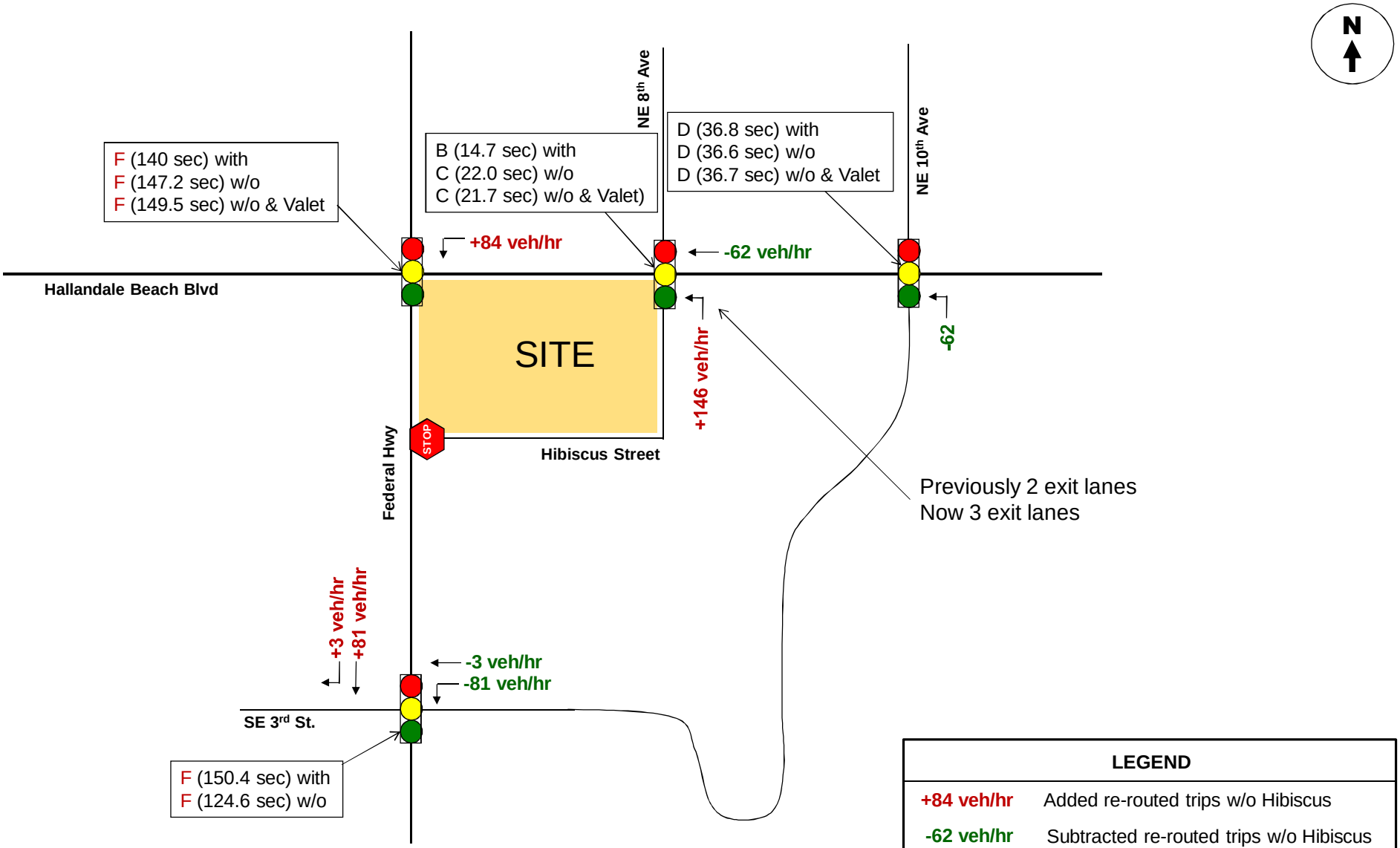
Joaquin E. Vargas, P.E.
Senior Transportation Engineer

8400 North University Drive, Suite 309, Tamarac, Florida 33321
Tel: (954) 582-0988 Fax: (954) 582-0989



LEGEND	
+84 veh/hr	Added re-routed trips w/o Hibiscus
-62 veh/hr	Subtracted re-routed trips w/o Hibiscus

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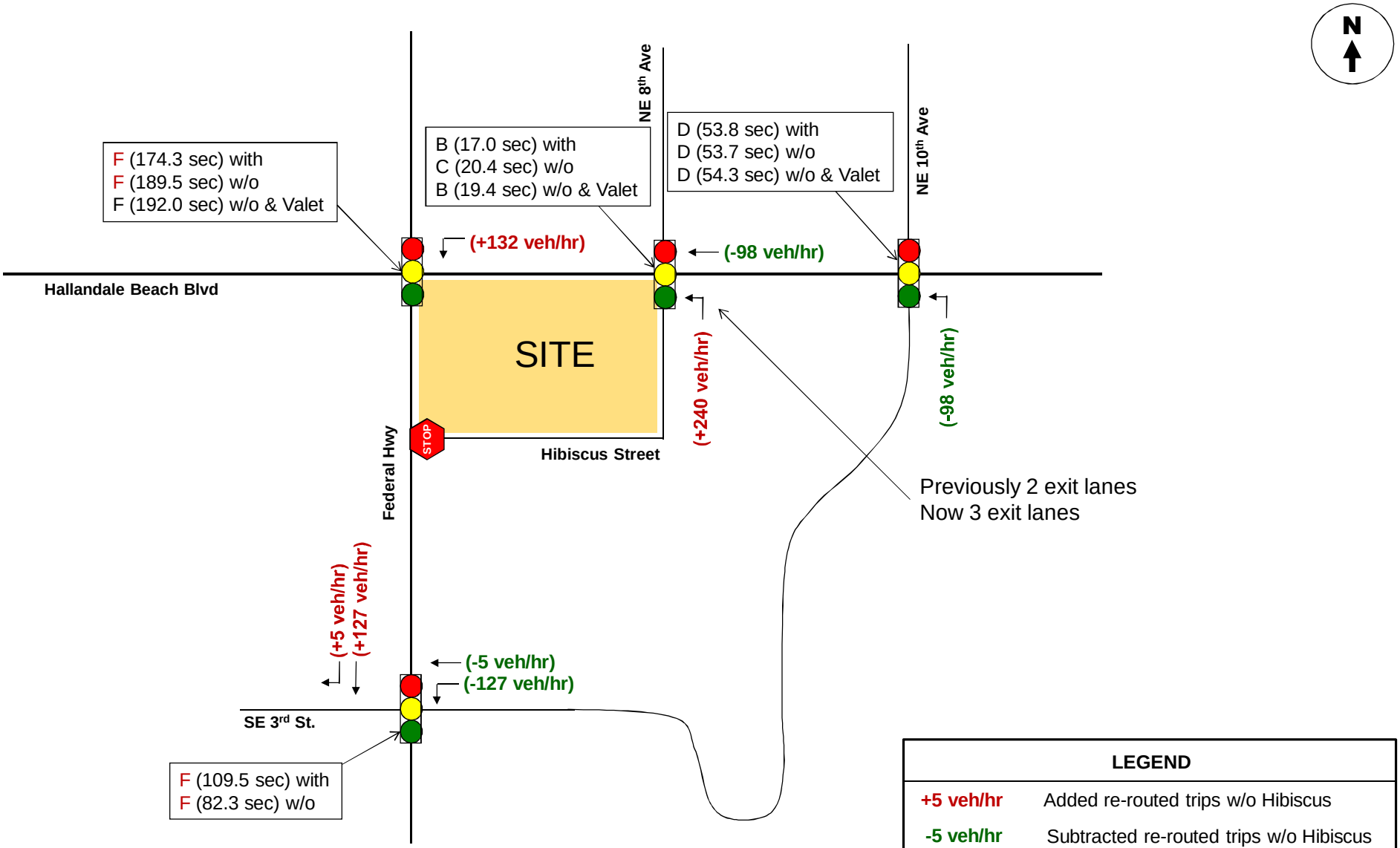
Comparison with and without Hibiscus Street – AM Peak Hour

FIGURE 1
Chateau Square
Hallandale Beach, Florida



LEGEND	
+5 veh/hr	Added re-routed trips w/o Hibiscus
-5 veh/hr	Subtracted re-routed trips w/o Hibiscus

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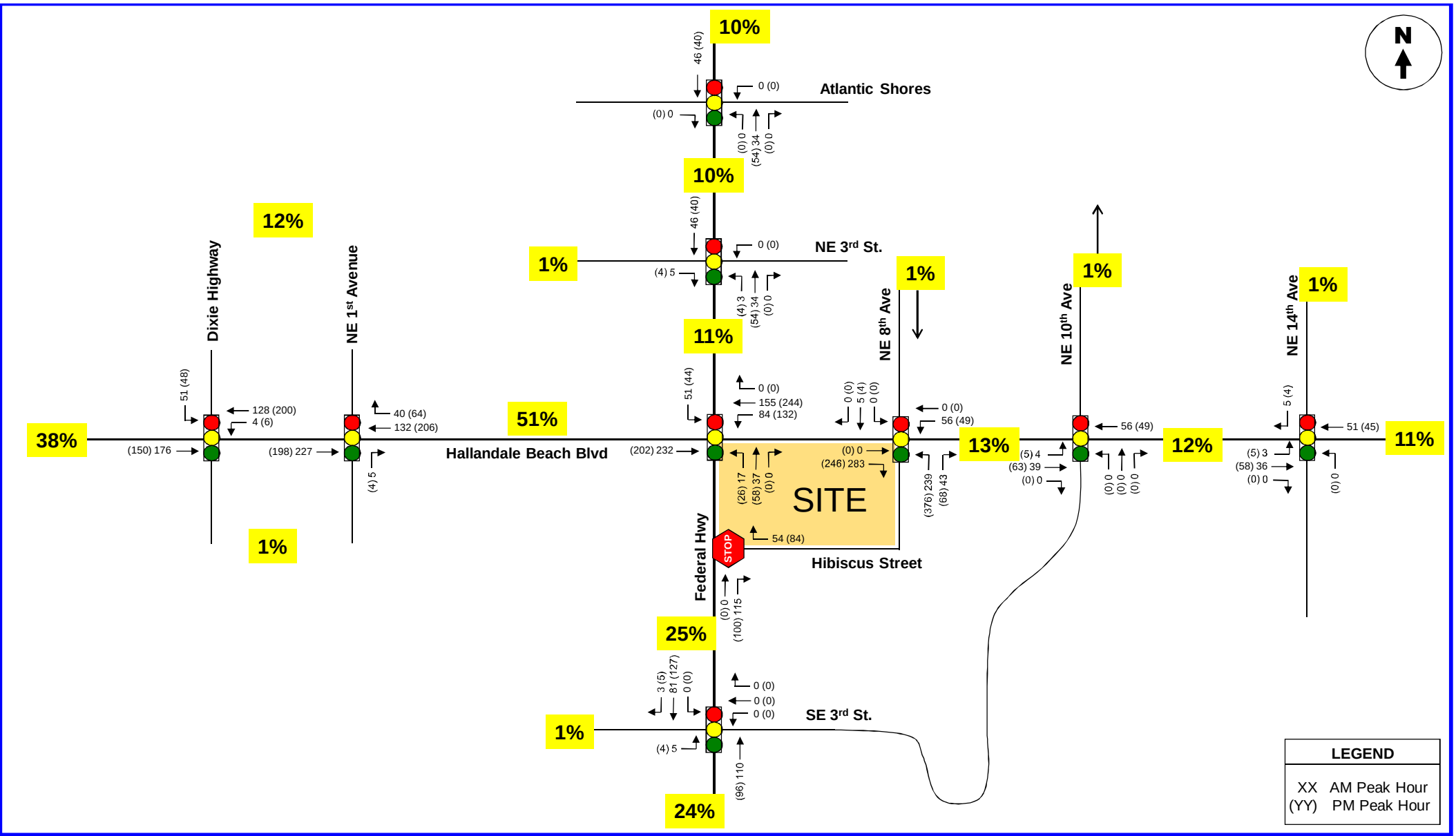
Comparison with and without Hibiscus Street – PM Peak Hour

FIGURE 2
Chateau Square
Hallandale Beach, Florida

ATTACHMENT A

Revised Figures 4a, 4c, 7a, 7b and 7c



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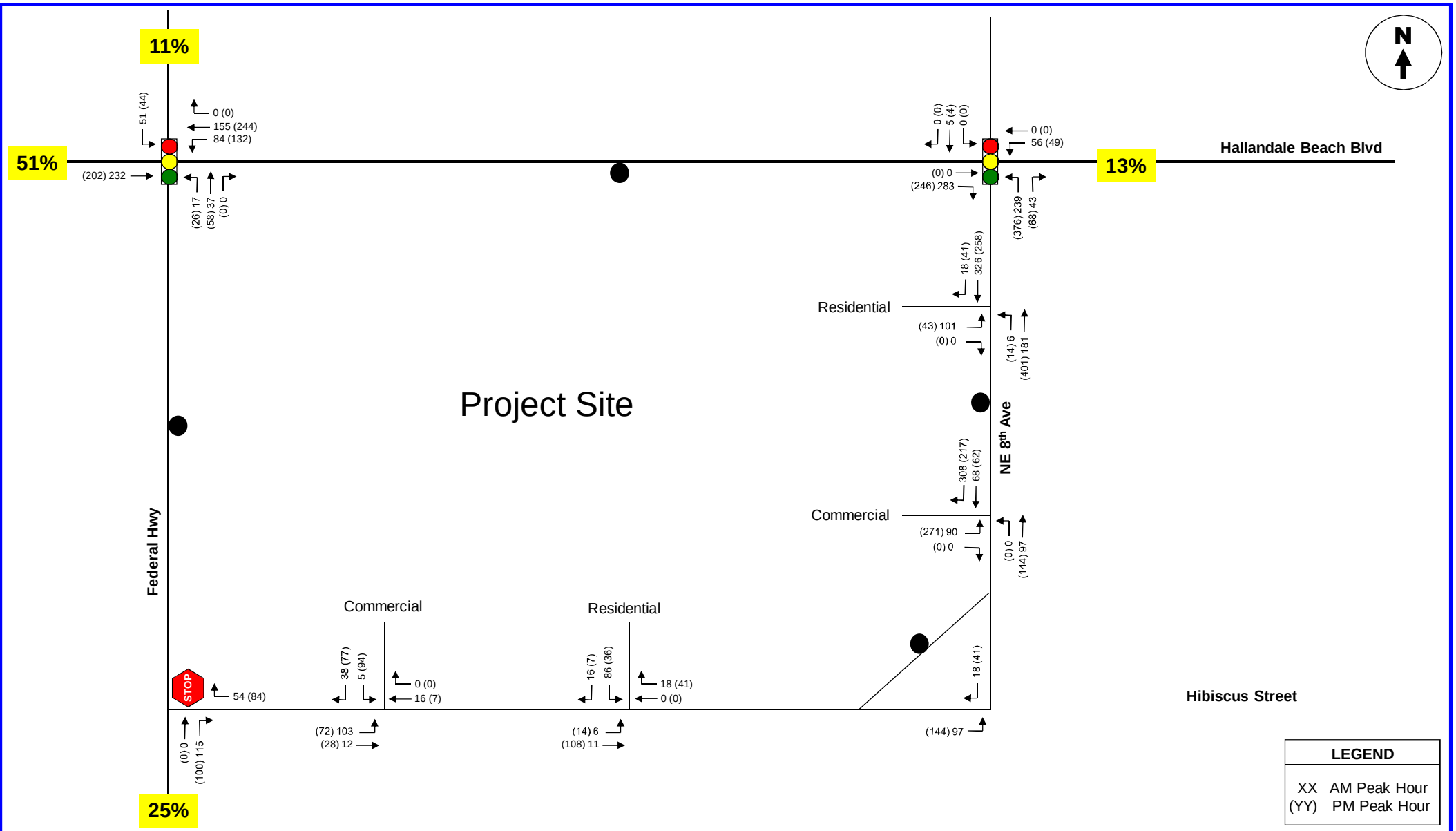
PROJECT TRAFFIC ASSIGNMENT – External Trips

FIGURE 4a
Chateau Square
Hallandale Beach, Florida



LEGEND	
XX	AM Peak Hour
(YY)	PM Peak Hour

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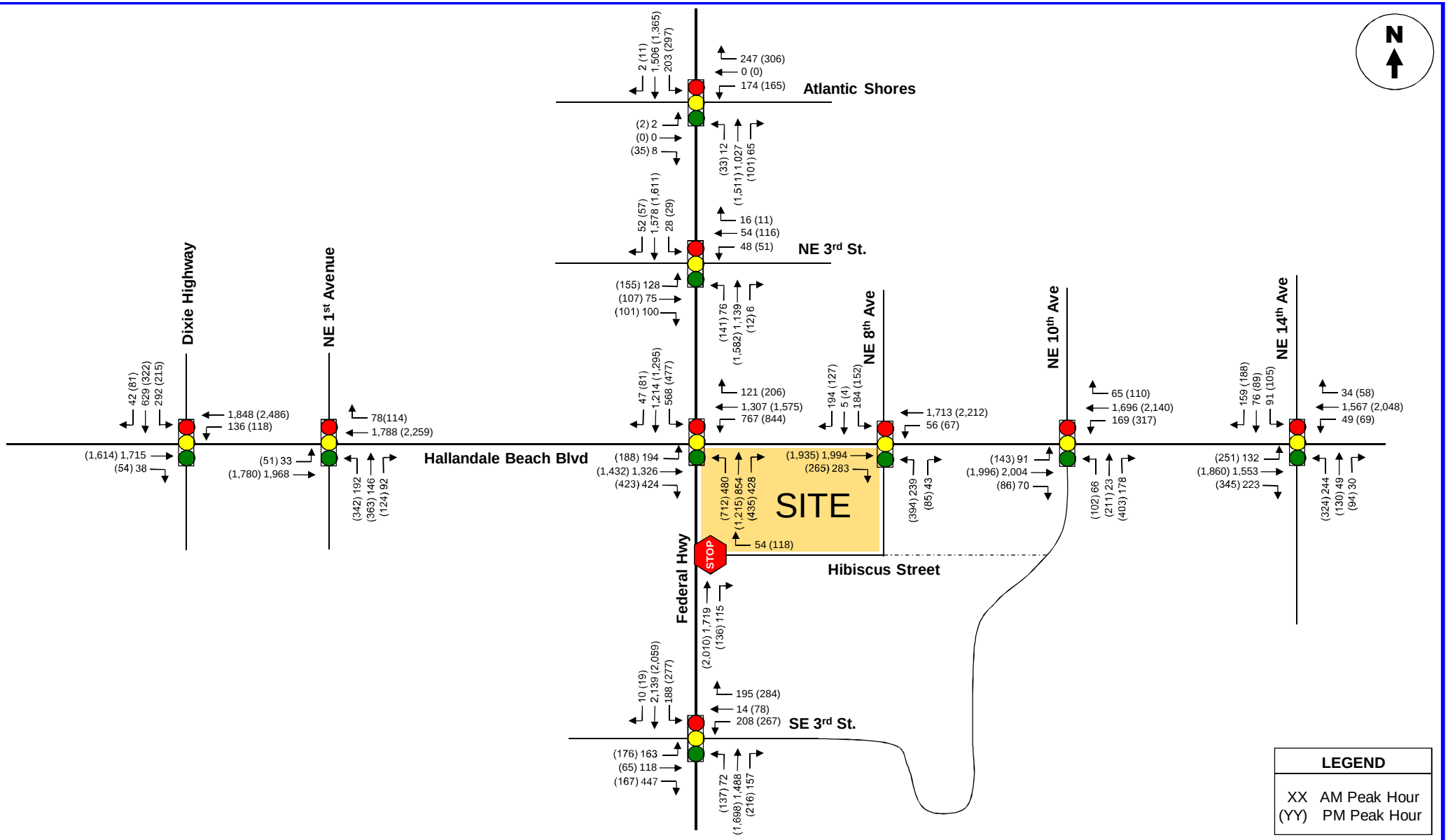
PROJECT TRAFFIC ASSIGNMENT – External Trips

FIGURE 4c
Chateau Square
Hallandale Beach, Florida



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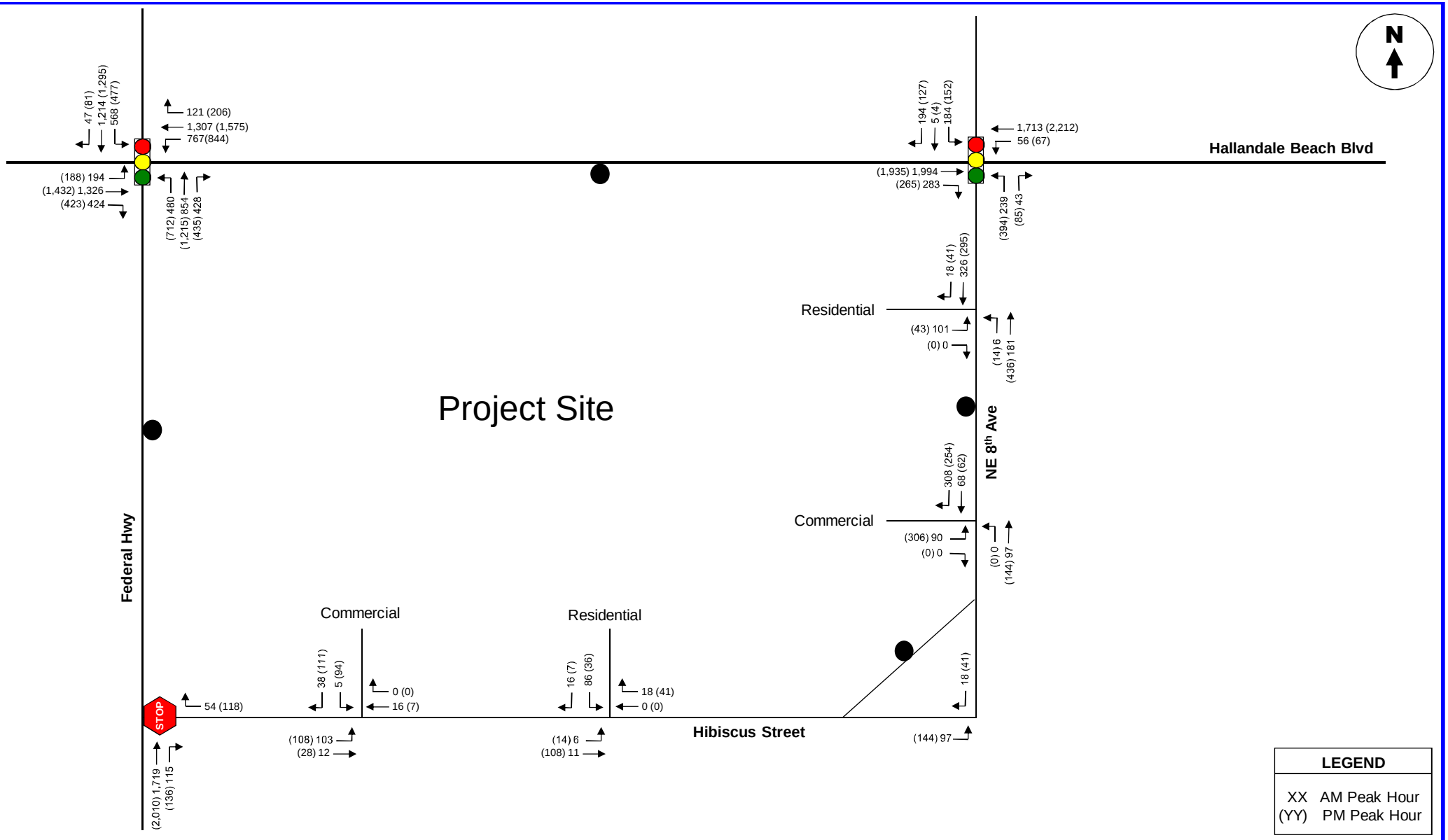
TOTAL TRAFFIC CONDITIONS with PROJECT and NO VALET – Year 2022

FIGURE 7a
Chateau Square
Hallandale Beach, Florida



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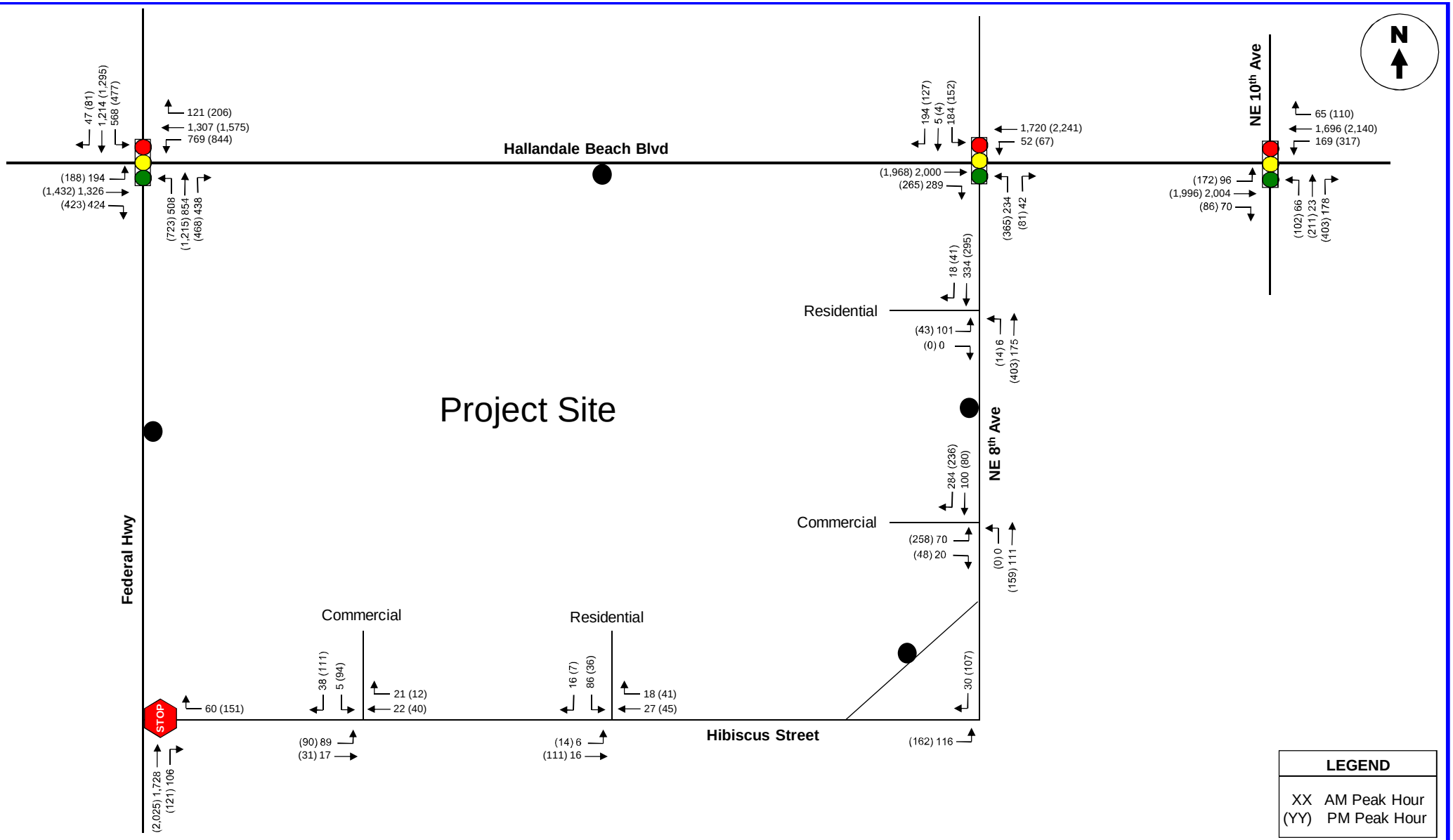
TOTAL TRAFFIC CONDITIONS with PROJECT and NO VALET – Year 2022

FIGURE 7b
Chateau Square
Hallandale Beach, Florida



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TOTAL TRAFFIC CONDITIONS with PROJECT and VALET SERVICE – Year 2022

FIGURE 7c
Chateau Square
Hallandale Beach, Florida

ATTACHMENT B

Revised Future Turning Movement Volumes for US 1/HBB, US 1/SE 3rd Street, HBB/NE 8th Avenue, HBB/NE 10th Avenue, North Residential Driveway and South Commercial Driveway on SE 8th Avenue

FUTURE TURNING MOVEMENT VOLUME ANALYSIS

East Hallandale Beach Boulevard and Federal Highway
AM Peak Hour

	Federal Highway Northbound			Federal Highway Southbound			E. Hallandale Bch Eastbound			E. Hallandale Bch Westbound		
Description	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Existing Traffic (4/15/2015)	291	645	318	435	980	42	174	886	285	543	924	87
Season Adjustment Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
2015 Peak Season Traffic	303	671	331	452	1019	44	181	921	296	565	961	90
Annual Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Committed developments												
Beachwalk			18	21				22		42	20	10
7th Avenue Village								11			19	
CVS Pharmacy								5			5	
Diplomat Golf Course & Tennis			55					55		36	37	
Gulfstream Park	139	46		11	35			11	106		14	14
Gulfstream Point		35			36							
Hallandale ArtSquare		17			50							
Hallandale Oasis								2			27	
2022 Background Traffic	463	817	428	517	1,214	47	194	1,094	424	683	1,152	121
Existing Development												
Chateau Square:												
Primary Trip	17	37		51				232		84	155	
Pass-By trips												
2022 Total Traffic	**480**	**854**	**428**	**568**	**1,214**	**47**	**194**	**1,326**	**424**	**767**	**1,307**	**121**

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FUTURE TURNING MOVEMENT VOLUME ANALYSIS

East Hallandale Beach Boulevard and Federal Highway
PM Peak Hour

	Federal Highway Northbound			Federal Highway Southbound			E. Hallandale Bch Eastbound			E. Hallandale Bch Westbound		
Description	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Existing Traffic (4/15/2015)	514	936	323	361	1,028	73	169	898	245	562	1,021	160
Season Adjustment Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
2015 Peak Season Traffic	535	973	336	375	1069	76	176	934	255	584	1062	166
Annual Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Committed developments												
Beachwalk			27	15				17		33	21	17
7th Avenue Village								55			51	
CVS Pharmacy								18			18	
Diplomat Golf Course & Tennis			48					48		52	53	
Gulfstream Park	113	38		15	50			15	150		11	11
Gulfstream Point		34			45							
Hallandale ArtSquare		41			54							
Hallandale Oasis								76			39	
2022 Background Traffic	686	1,157	435	433	1,295	81	188	1,230	423	712	1,331	206
Existing Development												
Chateau Square:												
Primary Trip	26	58		44				202		132	244	
Pass-By trips												
2022 Total Traffic	**712**	**1,215**	**435**	**477**	**1,295**	**81**	**188**	**1,432**	**423**	**844**	**1,575**	**206**

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FUTURE TURNING MOVEMENT VOLUME ANALYSIS

East Hallandale Beach Boulevard and NE 8th Avenue
AM Peak Hour

	NE 8th Avenue Northbound			NE 8th Avenue Southbound			E. Hallandale Bch Eastbound			E. Hallandale Bch Westbound		
Description	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Existing Traffic (4/15/2015)	12		24	161	0	174		1,596	20	19	1,336	
Season Adjustment Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
2015 Peak Season Traffic	12	0	25	167	0	181	0	1660	21	20	1389	0
Annual Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Committed developments												
Beachwalk				4				65			71	
7th Avenue Village								11			19	
CVS Pharmacy								5			5	
Diplomat Golf Course & Tennis								110			73	
Gulfstream Park								21			28	
Gulfstream Point												
Hallandale ArtSquare												
Hallandale Oasis								2			27	
2022 Background Traffic	13	0	27	184	0	194	0	1,994	22	21	1,713	0
Existing Development	-13		-27						-22	-21		
Chateau Square:												
Primary Trip	239		43		5				283	56	0	
Pass-By trips												
2022 Total Traffic	**239**	**0**	**43**	**184**	**5**	**194**	**0**	**1,994**	**283**	**56**	**1,713**	**0**

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FUTURE TURNING MOVEMENT VOLUME ANALYSIS

East Hallandale Beach Boulevard and NE 8th Avenue
PM Peak Hour

	NE 8th Avenue Northbound			NE 8th Avenue Southbound			E. Hallandale Bch Eastbound			E. Hallandale Bch Westbound		
Description	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Existing Traffic (4/15/2015)	24		43	134	4	114		1,452	22	17	1,724	
Season Adjustment Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
2015 Peak Season Traffic	25	0	45	139	4	119	0	1510	23	18	1793	0
Annual Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Committed developments												
Beachwalk				3				60			72	
7th Avenue Village								55			51	
CVS Pharmacy								18			18	
Diplomat Golf Course & Tennis								96			105	
Gulfstream Park								30			23	
Gulfstream Point												
Hallandale ArtSquare												
Hallandale Oasis								76			39	
2022 Background Traffic	27	0	48	152	4	127	0	1,954	25	19	2,230	0
Existing Development	-27		-48		-4				-25	-19		
Chateau Square:												
Primary Trip	376		68		4				246	49	0	
Pass-By trips	18		17					-19	19	18	-18	
2022 Total Traffic	**394**	**0**	**85**	**152**	**4**	**127**	**0**	**1,935**	**265**	**67**	**2,212**	**0**

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FUTURE TURNING MOVEMENT VOLUME ANALYSIS

East Hallandale Beach Boulevard and NE 10th Avenue
AM Peak Hour

	NE 10th Avenue Northbound			NE 10th Avenue Southbound			E. Hallandale Bch Eastbound			E. Hallandale Bch Westbound		
Description	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Existing Traffic (4/15/2015)	34	16	102				78	1,589	44	104	1,296	55
Season Adjustment Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
2015 Peak Season Traffic	35	17	106	0	0	0	81	1653	46	108	1348	57
Annual Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Committed developments												
Beachwalk			1					65		2	71	2
7th Avenue Village								11			19	
CVS Pharmacy								5			5	
Diplomat Golf Course & Tennis			3					110		2	73	
Gulfstream Park	28	5	60						21	46		
Gulfstream Point												
Hallandale ArtSquare												
Hallandale Oasis								2		3	27	2
2022 Background Traffic	66	23	178	0	0	0	87	1,965	70	169	1,640	65
Existing Development												
Chateau Square:												
Primary Trip	0						4	39			56	
Pass-By trips												
2022 Total Traffic	**66**	**23**	**178**	**0**	**0**	**0**	**91**	**2,004**	**70**	**169**	**1,696**	**65**

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FUTURE TURNING MOVEMENT VOLUME ANALYSIS

East Hallandale Beach Boulevard and NE 10th Avenue
PM Peak Hour

	NE 10th Avenue Northbound			NE 10th Avenue Southbound			E. Hallandale Bch Eastbound			E. Hallandale Bch Westbound		
Description	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Existing Traffic (4/15/2015)	71	186	281				124	1,457	50	218	1,620	96
Season Adjustment Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
2015 Peak Season Traffic	74	193	292	0	0	0	129	1515	52	227	1685	100
Annual Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Committed developments												
Beachwalk								63		1	72	1
7th Avenue Village								55			51	
CVS Pharmacy								18			18	
Diplomat Golf Course & Tennis			31					96		3	105	
Gulfstream Park	23	4	49						30	65		
Gulfstream Point												
Hallandale ArtSquare												
Hallandale Oasis			10					76		5	39	2
2022 Background Traffic	102	211	403	0	0	0	138	1,933	86	317	2,091	110
Existing Development												
Chateau Square:												
Primary Trip							5	63			49	
Pass-By trips												
2022 Total Traffic	**102**	**211**	**403**	**0**	**0**	**0**	**143**	**1,996**	**86**	**317**	**2,140**	**110**

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FUTURE TURNING MOVEMENT VOLUME ANALYSIS

Federal Highway and SE 3rd Avenue
AM Peak Hour

	Federal Highway Northbound			Federal Hihgway Southbound			SE 3rd Avenue Eastbound			SE 3rd Avenue Westbound		
Description	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Existing Traffic (4/15/2015)	64	1,124	16	41	1,699	6	142	102	396	23	8	9
Season Adjustment Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
2015 Peak Season Traffic	67	1169	17	43	1767	6	148	106	412	24	8	9
Annual Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Committed developments												
Beachwalk		18			42							
7th Avenue Village												
CVS Pharmacy												
Diplomat Golf Course & Tennis		55			36							
Gulfstream Park			138	142				4		181	5	185
Gulfstream Point	1	35	1		36				5	1		
Hallandale ArtSquare		17			50							
Hallandale Oasis												
2022 Background Traffic	72	1,378	157	188	2,058	7	158	118	447	208	14	195
Existing Development												
Chateau Square:												
Primary Trip		110			81	3	5					
Pass-By trips												
2022 Total Traffic	**72**	**1,488**	**157**	**188**	**2,139**	**10**	**163**	**118**	**447**	**208**	**14**	**195**

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FUTURE TURNING MOVEMENT VOLUME ANALYSIS

Federal Highway and SE 3rd Avenue
PM Peak Hour

	Federal Highway Northbound			Federal Hihgway Southbound			SE 3rd Avenue Eastbound			SE 3rd Avenue Westbound		
Description	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Existing Traffic (4/15/2015)	121	1,302	17	69	1,568	13	154	54	145	106	66	120
Season Adjustment Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
2015 Peak Season Traffic	126	1354	18	72	1631	14	160	56	151	110	69	125
Annual Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Committed Developments:												
Beachwalk		27			33							
7th Avenue Village												
CVS Pharmacy												
Diplomat Golf Course & Tennis		48			52							
Gulfstream Park			195	200				5		147	4	150
Gulfstream Point	2	34	2		45				5	2		
Hallandale ArtSquare		41			54							
Hallandale Oasis												
2022 Background Traffic	137	1,602	216	277	1,932	14	172	65	167	267	78	284
Existing Development												
Chateau Square:												
Primary Trip		96			127	5	4					
Pass-By trips												
2022 Total Traffic	**137**	**1,698**	**216**	**277**	**2,059**	**19**	**176**	**65**	**167**	**267**	**78**	**284**

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FUTURE TURNING MOVEMENT VOLUME ANALYSIS

NE 8th Avenue and SE Commercial Driveway
AM Peak Hour

	NE 8th Avenue Northbound			NE 8th Avenue Southbound			SE Commercial Drive Eastbound			Westbound		
Description	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Existing Traffic (4/15/2015)		36			39							
Season Adjustment Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
2015 Peak Season Traffic	0	37	0	0	41	0	0	0	0	0	0	0
Annual Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Committed developments												
2022 Background Traffic	0	40	0	0	43	0	0	0	0	0	0	0
Existing Development		-40			-43							
Chateau Square:												
Primary Trips		97			68	308	90					
Pass-By Trips												
2022 Total Traffic	**0**	**97**	**0**	**0**	**68**	**308**	**90**	**0**	**0**	**0**	**0**	**0**

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FUTURE TURNING MOVEMENT VOLUME ANALYSIS

NE 8th Avenue and SE Commercial Driveway
PM Peak Hour

	NE 8th Avenue Northbound			NE 8th Avenue Southbound			SE Commercial Drive Eastbound			Westbound		
Description	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Existing Traffic (4/15/2015)		67			43							
Season Adjustment Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
2015 Peak Season Traffic	0	70	0	0	45	0	0	0	0	0	0	0
Annual Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Committed developments												
2022 Background Traffic	0	75	0	0	48	0	0	0	0	0	0	0
Existing Development		-75			-48							
Chateau Square:												
Primary Trips		144			62	217	271					
Pass-By Trips						37	35					
2022 Total Traffic	**0**	**144**	**0**	**0**	**62**	**254**	**306**	**0**	**0**	**0**	**0**	**0**

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FUTURE TURNING MOVEMENT VOLUME ANALYSIS

NE 8th Avenue and Residential Driveway
AM Peak Hour

Description	NE 8th Avenue Northbound			NE 8th Avenue Southbound			NE Residential Drive Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Existing Traffic (4/15/2015)		36			39							
Season Adjustment Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
2015 Peak Season Traffic	0	37	0	0	41	0	0	0	0	0	0	0
Annual Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Committed developments												
2022 Background Traffic	0	40	0	0	43	0	0	0	0	0	0	0
Existing Development		-40			-43							
Chateau Square:												
Primary Trips	6	181			326	18	101					
Pass-By Trips												
2022 Total Traffic	**6**	**181**	**0**	**0**	**326**	**18**	**101**	**0**	**0**	**0**	**0**	**0**

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FUTURE TURNING MOVEMENT VOLUME ANALYSIS

NE 8th Avenue and Residential Driveway
PM Peak Hour

Description	NE 8th Avenue Northbound			NE 8th Avenue Southbound			NE Residential Drive Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Existing Traffic (4/15/2015)		67			43							
Season Adjustment Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
2015 Peak Season Traffic	0	70	0	0	45	0	0	0	0	0	0	0
Annual Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Committed developments												
2022 Background Traffic	0	75	0	0	48	0	0	0	0	0	0	0
Existing Development		-75			-48							
Chateau Square:												
Primary Trips	14	401			258	41	43					
Pass-By Trips		35			37							
2022 Total Traffic	**14**	**436**	**0**	**0**	**295**	**41**	**43**	**0**	**0**	**0**	**0**	**0**

Traf Tech
ENGINEERING, INC.

ATTACHMENT C

Revised SYNCHRO Analyses for US 1/HBB, US 1/SE 3rd Street, HBB/NE 8th Avenue, HBB/NE 10th Avenue, North Residential Driveway and South Commercial Driveway on NE 8th Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	194	1326	424	683	1307	121	480	854	428	568	1214	47
Future Volume (veh/h)	194	1326	424	683	1307	121	480	854	428	568	1214	47
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		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	204	1396	446	719	1376	127	505	899	451	598	1278	49
Adj No. of Lanes	1	3	0	2	3	0	2	3	1	2	3	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	224	1037	329	570	1472	136	452	1303	402	452	1288	49
Arrive On Green	0.13	0.27	0.27	0.17	0.31	0.31	0.13	0.26	0.26	0.13	0.26	0.26
Sat Flow, veh/h	1774	3815	1210	3442	4733	437	3442	5085	1570	3442	5025	193
Grp Volume(v), veh/h	204	1239	603	719	986	517	505	899	451	598	862	465
Grp Sat Flow(s),veh/h/ln	1774	1695	1635	1721	1695	1780	1721	1695	1570	1721	1695	1828
Q Serve(g_s), s	18.2	43.5	43.5	26.5	45.2	45.2	21.0	25.6	41.0	21.0	40.6	40.6
Cycle Q Clear(g_c), s	18.2	43.5	43.5	26.5	45.2	45.2	21.0	25.6	41.0	21.0	40.6	40.6
Prop In Lane	1.00		0.74	1.00		0.25	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	224	922	445	570	1054	554	452	1303	402	452	869	468
V/C Ratio(X)	0.91	1.34	1.36	1.26	0.93	0.93	1.12	0.69	1.12	1.32	0.99	0.99
Avail Cap(c_a), veh/h	238	922	445	570	1054	554	452	1303	402	452	869	468
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.78	0.78	0.78	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	69.0	58.3	58.3	66.7	53.5	53.5	69.5	53.8	59.5	69.5	59.3	59.3
Incr Delay (d2), s/veh	34.0	162.3	174.3	128.6	12.2	19.6	78.6	3.0	81.9	160.5	28.7	39.8
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(95%),veh/ln	16.5	74.0	74.1	41.0	30.0	32.6	26.8	18.1	48.5	36.1	30.3	34.0
LnGrp Delay(d),s/veh	102.9	220.6	232.6	195.3	65.7	73.2	148.1	56.8	141.4	230.0	88.1	99.1
LnGrp LOS	F	F	F	F	E	E	F	E	F	F	F	F
Approach Vol, veh/h		2046			2222			1855			1925	
Approach Delay, s/veh		212.4			109.4			102.2			134.8	
Approach LOS		F			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	28.0	49.0	33.0	50.0	28.0	49.0	26.7	56.3
Change Period (Y+Rc), s	7.0	8.0	6.5	6.5	7.0	8.0	6.5	6.5
Max Green Setting (Gmax), s	21.0	41.0	26.5	43.5	21.0	41.0	21.5	48.5
Max Q Clear Time (g_c+I1), s	23.0	43.0	28.5	45.5	23.0	42.6	20.2	47.2
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.3

Intersection Summary	
HCM 2010 Ctrl Delay	140.0
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1994	283	56	1775	0	93	0	43	184	5	194
Future Volume (veh/h)	0	1994	283	56	1775	0	93	0	43	184	5	194
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	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	0	1863	1863	1863	1863	0	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	0	2167	308	61	1929	0	74	38	47	200	5	211
Adj No. of Lanes	0	3	1	1	3	0	1	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0	2	2	2	2	2	2
Cap, veh/h	0	3100	949	169	3412	0	114	49	60	264	7	241
Arrive On Green	0.00	1.00	1.00	0.02	0.67	0.00	0.06	0.06	0.06	0.15	0.15	0.15
Sat Flow, veh/h	0	5253	1557	1774	5253	0	1774	759	938	1733	43	1583
Grp Volume(v), veh/h	0	2167	308	61	1929	0	74	0	85	205	0	211
Grp Sat Flow(s),veh/h/ln	0	1695	1557	1774	1695	0	1774	0	1697	1776	0	1583
Q Serve(g_s), s	0.0	0.0	0.0	2.0	32.2	0.0	6.5	0.0	7.9	17.7	0.0	20.9
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.0	32.2	0.0	6.5	0.0	7.9	17.7	0.0	20.9
Prop In Lane	0.00		1.00	1.00		0.00	1.00		0.55	0.98		1.00
Lane Grp Cap(c), veh/h	0	3100	949	169	3412	0	114	0	109	271	0	241
V/C Ratio(X)	0.00	0.70	0.32	0.36	0.57	0.00	0.65	0.00	0.78	0.76	0.00	0.87
Avail Cap(c_a), veh/h	0	3100	949	260	3412	0	211	0	202	389	0	346
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.09	0.09	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	10.4	14.0	0.0	73.1	0.0	73.8	65.0	0.0	66.3
Incr Delay (d2), s/veh	0.0	0.1	0.1	1.3	0.7	0.0	6.1	0.0	11.4	5.1	0.0	15.7
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(95%),veh/ln	0.0	0.1	0.0	1.9	21.6	0.0	6.1	0.0	7.3	14.0	0.0	15.4
LnGrp Delay(d),s/veh	0.0	0.1	0.1	11.7	14.6	0.0	79.2	0.0	85.1	70.1	0.0	82.0
LnGrp LOS		A	A	B	B		E		F	E		F
Approach Vol, veh/h		2475			1990			159			416	
Approach Delay, s/veh		0.1			14.6			82.4			76.1	
Approach LOS		A			B			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		113.3		16.3	9.8	103.5		30.4
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s		88.0		19.0	12.0	70.0		35.0
Max Q Clear Time (g_c+I1), s		34.2		9.9	4.0	2.0		22.9
Green Ext Time (p_c), s		51.8		0.4	0.1	64.8		1.5

Intersection Summary	
HCM 2010 Ctrl Delay	14.7
HCM 2010 LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	2004	70	169	1696	65	128	23	178	0	0	0
Future Volume (veh/h)	91	2004	70	169	1696	65	128	23	178	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863			
Adj Flow Rate, veh/h	96	2109	74	178	1785	68	152	0	187			
Adj No. of Lanes	1	3	1	2	3	1	2	0	1			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2			
Cap, veh/h	117	2604	800	224	2599	800	887	0	395			
Arrive On Green	0.07	0.51	0.51	0.07	0.51	0.51	0.25	0.00	0.25			
Sat Flow, veh/h	1774	5085	1562	3442	5085	1566	3548	0	1581			
Grp Volume(v), veh/h	96	2109	74	178	1785	68	152	0	187			
Grp Sat Flow(s),veh/h/ln	1774	1695	1562	1721	1695	1566	1774	0	1581			
Q Serve(g_s), s	8.5	55.3	3.9	8.2	42.3	3.6	5.4	0.0	16.1			
Cycle Q Clear(g_c), s	8.5	55.3	3.9	8.2	42.3	3.6	5.4	0.0	16.1			
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	117	2604	800	224	2599	800	887	0	395			
V/C Ratio(X)	0.82	0.81	0.09	0.79	0.69	0.08	0.17	0.00	0.47			
Avail Cap(c_a), veh/h	266	2733	839	344	2599	800	887	0	395			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	73.8	32.6	20.0	73.7	29.5	20.0	47.0	0.0	51.0			
Incr Delay (d2), s/veh	13.0	1.9	0.0	7.0	1.5	0.2	0.4	0.0	4.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(95%),veh/ln	8.1	34.6	3.0	7.4	27.6	2.8	4.8	0.0	11.9			
LnGrp Delay(d),s/veh	86.8	34.4	20.0	80.7	31.0	20.2	47.4	0.0	55.1			
LnGrp LOS	F	C	C	F	C	C	D		E			
Approach Vol, veh/h		2279			2031			339				
Approach Delay, s/veh		36.1			35.0			51.6				
Approach LOS		D			C			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4			7	8
Phs Duration (G+Y+Rc), s		46.0	16.4	87.9			16.6	87.8
Change Period (Y+Rc), s		6.0	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s		40.0	16.0	86.0			24.0	78.0
Max Q Clear Time (g_c+I1), s		18.1	10.2	57.3			10.5	44.3
Green Ext Time (p_c), s		1.1	0.3	24.6			0.2	32.4

Intersection Summary	
HCM 2010 Ctrl Delay	36.8
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	163	118	447	289	17	195	72	1488	157	188	2058	7
Future Volume (veh/h)	163	118	447	289	17	195	72	1488	157	188	2058	7
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		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	179	130	491	318	19	214	79	1635	173	207	2262	8
Adj No. of Lanes	1	1	0	1	1	2	1	3	1	2	3	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	455	87	330	351	369	549	97	1664	515	194	1719	6
Arrive On Green	0.26	0.26	0.26	0.20	0.20	0.20	0.05	0.33	0.33	0.06	0.33	0.33
Sat Flow, veh/h	1774	341	1288	1774	1863	2774	1774	5085	1573	3442	5231	18
Grp Volume(v), veh/h	179	0	621	318	19	214	79	1635	173	207	1466	804
Grp Sat Flow(s),veh/h/ln	1774	0	1628	1774	1863	1387	1774	1695	1573	1721	1695	1859
Q Serve(g_s), s	13.4	0.0	41.0	28.0	1.3	10.7	7.0	51.0	13.3	9.0	52.6	52.6
Cycle Q Clear(g_c), s	13.4	0.0	41.0	28.0	1.3	10.7	7.0	51.0	13.3	9.0	52.6	52.6
Prop In Lane	1.00		0.79	1.00		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	455	0	417	351	369	549	97	1664	515	194	1114	611
V/C Ratio(X)	0.39	0.00	1.49	0.91	0.05	0.39	0.81	0.98	0.34	1.07	1.32	1.32
Avail Cap(c_a), veh/h	455	0	417	421	442	659	100	1664	515	194	1114	611
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	1.00	1.00
Uniform Delay (d), s/veh	49.2	0.0	59.5	62.7	52.0	55.8	74.8	53.4	40.7	75.5	53.7	53.7
Incr Delay (d2), s/veh	0.6	0.0	232.1	20.5	0.1	0.5	37.3	18.3	1.8	84.3	148.6	153.9
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(95%),veh/ln	10.9	0.0	81.6	22.3	1.2	7.5	7.9	35.2	10.0	11.8	85.7	95.6
LnGrp Delay(d),s/veh	49.8	0.0	291.6	83.2	52.1	56.2	112.1	71.7	42.5	159.8	202.3	207.6
LnGrp LOS	D		F	F	D	E	F	E	D	F	F	F
Approach Vol, veh/h		800			551			1887			2477	
Approach Delay, s/veh		237.5			71.7			70.7			200.5	
Approach LOS		F			E			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	16.0	59.3		47.0	15.8	59.6		37.7
Change Period (Y+Rc), s	7.0	7.0		6.0	7.0	7.0		6.0
Max Green Setting (Gmax), s	9.0	46.0		41.0	9.0	46.0		38.0
Max Q Clear Time (g_c+I1), s	11.0	53.0		43.0	9.0	54.6		30.0
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		1.3

Intersection Summary	
HCM 2010 Ctrl Delay	150.4
HCM 2010 LOS	F

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	51	50	6	85	326	18
Future Vol, veh/h	51	50	6	85	326	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	55	54	7	92	354	20

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	469	364	374	0	-	0
Stage 1	364	-	-	-	-	-
Stage 2	105	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	553	681	1184	-	-	-
Stage 1	703	-	-	-	-	-
Stage 2	919	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	550	681	1184	-	-	-
Mov Cap-2 Maneuver	703	-	-	-	-	-
Stage 1	703	-	-	-	-	-
Stage 2	913	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.2	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1184	-	692	-	-
HCM Lane V/C Ratio	0.006	-	0.159	-	-
HCM Control Delay (s)	8.1	0	11.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.6	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	85	5	0	6	68	308
Future Vol, veh/h	85	5	0	6	68	308
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	92	5	0	7	74	335

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	248	241	409	0	-	0
Stage 1	241	-	-	-	-	-
Stage 2	7	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	740	798	1150	-	-	-
Stage 1	799	-	-	-	-	-
Stage 2	1016	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	740	798	1150	-	-	-
Mov Cap-2 Maneuver	799	-	-	-	-	-
Stage 1	799	-	-	-	-	-
Stage 2	1016	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1150	-	799	-	-
HCM Lane V/C Ratio	-	-	0.122	-	-
HCM Control Delay (s)	0	-	10.1	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	194	1326	424	767	1307	121	480	854	428	568	1214	47
Future Volume (veh/h)	194	1326	424	767	1307	121	480	854	428	568	1214	47
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		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	204	1396	446	807	1376	127	505	899	451	598	1278	49
Adj No. of Lanes	1	3	0	2	3	0	2	3	1	2	3	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	224	1037	329	570	1472	136	452	1303	402	452	1288	49
Arrive On Green	0.13	0.27	0.27	0.17	0.31	0.31	0.13	0.26	0.26	0.13	0.26	0.26
Sat Flow, veh/h	1774	3815	1210	3442	4733	437	3442	5085	1570	3442	5025	193
Grp Volume(v), veh/h	204	1239	603	807	986	517	505	899	451	598	862	465
Grp Sat Flow(s),veh/h/ln	1774	1695	1635	1721	1695	1780	1721	1695	1570	1721	1695	1828
Q Serve(g_s), s	18.2	43.5	43.5	26.5	45.2	45.2	21.0	25.6	41.0	21.0	40.6	40.6
Cycle Q Clear(g_c), s	18.2	43.5	43.5	26.5	45.2	45.2	21.0	25.6	41.0	21.0	40.6	40.6
Prop In Lane	1.00		0.74	1.00		0.25	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	224	922	445	570	1054	554	452	1303	402	452	869	468
V/C Ratio(X)	0.91	1.34	1.36	1.42	0.93	0.93	1.12	0.69	1.12	1.32	0.99	0.99
Avail Cap(c_a), veh/h	238	922	445	570	1054	554	452	1303	402	452	869	468
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.78	0.78	0.78	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	69.0	58.3	58.3	66.7	53.5	53.5	69.5	53.8	59.5	69.5	59.3	59.3
Incr Delay (d2), s/veh	34.0	162.3	174.3	195.1	12.1	19.6	78.6	3.0	81.9	160.5	28.7	39.8
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(95%),veh/ln	16.5	74.0	74.1	50.5	29.9	32.6	26.8	18.1	48.5	36.1	30.3	34.0
LnGrp Delay(d),s/veh	102.9	220.6	232.6	261.9	65.6	73.1	148.1	56.8	141.4	230.0	88.1	99.1
LnGrp LOS	F	F	F	F	E	E	F	E	F	F	F	F
Approach Vol, veh/h		2046			2310			1855			1925	
Approach Delay, s/veh		212.4			135.9			102.2			134.8	
Approach LOS		F			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	28.0	49.0	33.0	50.0	28.0	49.0	26.7	56.3
Change Period (Y+Rc), s	7.0	8.0	6.5	6.5	7.0	8.0	6.5	6.5
Max Green Setting (Gmax), s	21.0	41.0	26.5	43.5	21.0	41.0	21.5	48.5
Max Q Clear Time (g_c+I1), s	23.0	43.0	28.5	45.5	23.0	42.6	20.2	47.2
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.3

Intersection Summary	
HCM 2010 Ctrl Delay	147.2
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1994	283	56	1713	0	239	0	43	184	5	194
Future Volume (veh/h)	0	1994	283	56	1713	0	239	0	43	184	5	194
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	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	0	1863	1863	1863	1863	0	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	0	2167	308	61	1862	0	232	39	47	200	5	211
Adj No. of Lanes	0	3	1	1	3	0	2	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0	2	2	2	2	2	2
Cap, veh/h	0	3010	921	139	3325	0	288	63	75	264	7	241
Arrive On Green	0.00	0.79	0.79	0.02	0.65	0.00	0.08	0.08	0.08	0.15	0.15	0.15
Sat Flow, veh/h	0	5253	1557	1774	5253	0	3548	770	928	1733	43	1583
Grp Volume(v), veh/h	0	2167	308	61	1862	0	232	0	86	205	0	211
Grp Sat Flow(s),veh/h/ln	0	1695	1557	1774	1695	0	1774	0	1699	1776	0	1583
Q Serve(g_s), s	0.0	33.5	9.1	2.1	32.0	0.0	10.3	0.0	7.8	17.7	0.0	20.9
Cycle Q Clear(g_c), s	0.0	33.5	9.1	2.1	32.0	0.0	10.3	0.0	7.8	17.7	0.0	20.9
Prop In Lane	0.00		1.00	1.00		0.00	1.00		0.55	0.98		1.00
Lane Grp Cap(c), veh/h	0	3010	921	139	3325	0	288	0	138	271	0	241
V/C Ratio(X)	0.00	0.72	0.33	0.44	0.56	0.00	0.80	0.00	0.62	0.76	0.00	0.87
Avail Cap(c_a), veh/h	0	3010	921	229	3325	0	421	0	202	389	0	346
HCM Platoon Ratio	1.00	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.09	0.09	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	10.5	7.9	18.6	15.1	0.0	72.2	0.0	71.1	65.0	0.0	66.3
Incr Delay (d2), s/veh	0.0	0.1	0.1	2.1	0.7	0.0	7.0	0.0	4.5	5.1	0.0	15.7
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(95%),veh/ln	0.0	17.3	4.9	2.1	21.4	0.0	9.1	0.0	6.9	14.0	0.0	15.4
LnGrp Delay(d),s/veh	0.0	10.6	8.0	20.8	15.8	0.0	79.3	0.0	75.7	70.1	0.0	82.0
LnGrp LOS		B	A	C	B		E		E	E		F
Approach Vol, veh/h		2475			1923			318			416	
Approach Delay, s/veh		10.3			16.0			78.3			76.1	
Approach LOS		B			B			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		110.6		19.0	9.9	100.7		30.4
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s		88.0		19.0	12.0	70.0		35.0
Max Q Clear Time (g_c+I1), s		34.0		12.3	4.1	35.5		22.9
Green Ext Time (p_c), s		51.7		0.7	0.1	33.6		1.5

Intersection Summary	
HCM 2010 Ctrl Delay	22.0
HCM 2010 LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	2004	70	169	1696	65	66	23	178	0	0	0
Future Volume (veh/h)	91	2004	70	169	1696	65	66	23	178	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863			
Adj Flow Rate, veh/h	96	2109	74	178	1785	68	46	55	187			
Adj No. of Lanes	1	3	1	2	3	1	1	1	1			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2			
Cap, veh/h	117	2604	800	224	2599	800	444	466	395			
Arrive On Green	0.07	0.51	0.51	0.07	0.51	0.51	0.25	0.25	0.25			
Sat Flow, veh/h	1774	5085	1562	3442	5085	1566	1774	1863	1581			
Grp Volume(v), veh/h	96	2109	74	178	1785	68	46	55	187			
Grp Sat Flow(s),veh/h/ln	1774	1695	1562	1721	1695	1566	1774	1863	1581			
Q Serve(g_s), s	8.5	55.3	3.9	8.2	42.3	3.6	3.2	3.7	16.1			
Cycle Q Clear(g_c), s	8.5	55.3	3.9	8.2	42.3	3.6	3.2	3.7	16.1			
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	117	2604	800	224	2599	800	444	466	395			
V/C Ratio(X)	0.82	0.81	0.09	0.79	0.69	0.08	0.10	0.12	0.47			
Avail Cap(c_a), veh/h	266	2733	839	344	2599	800	444	466	395			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	73.8	32.6	20.0	73.7	29.5	20.0	46.2	46.4	51.0			
Incr Delay (d2), s/veh	13.0	1.9	0.0	7.0	1.5	0.2	0.5	0.5	4.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(95%),veh/ln	8.1	34.6	3.0	7.4	27.6	2.8	2.9	3.5	11.9			
LnGrp Delay(d),s/veh	86.8	34.4	20.0	80.7	31.0	20.2	46.7	46.9	55.1			
LnGrp LOS	F	C	C	F	C	C	D	D	E			
Approach Vol, veh/h		2279			2031			288				
Approach Delay, s/veh		36.1			35.0			52.2				
Approach LOS		D			C			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4			7	8
Phs Duration (G+Y+Rc), s		46.0	16.4	87.9			16.6	87.8
Change Period (Y+Rc), s		6.0	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s		40.0	16.0	86.0			24.0	78.0
Max Q Clear Time (g_c+I1), s		18.1	10.2	57.3			10.5	44.3
Green Ext Time (p_c), s		1.0	0.3	24.6			0.2	32.4

Intersection Summary	
HCM 2010 Ctrl Delay	36.6
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	163	118	447	208	14	195	72	1488	157	188	2139	10
Future Volume (veh/h)	163	118	447	208	14	195	72	1488	157	188	2139	10
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		1.00	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	179	130	491	229	15	214	79	1635	173	207	2351	11
Adj No. of Lanes	1	1	0	1	1	2	1	3	1	2	3	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	455	87	330	270	284	422	97	1895	587	194	1954	9
Arrive On Green	0.26	0.26	0.26	0.15	0.15	0.15	0.05	0.37	0.37	0.06	0.37	0.37
Sat Flow, veh/h	1774	341	1288	1774	1863	2770	1774	5085	1574	3442	5224	24
Grp Volume(v), veh/h	179	0	621	229	15	214	79	1635	173	207	1525	837
Grp Sat Flow(s),veh/h/ln	1774	0	1628	1774	1863	1385	1774	1695	1574	1721	1695	1858
Q Serve(g_s), s	13.4	0.0	41.0	20.1	1.1	11.4	7.0	47.6	12.4	9.0	59.8	59.8
Cycle Q Clear(g_c), s	13.4	0.0	41.0	20.1	1.1	11.4	7.0	47.6	12.4	9.0	59.8	59.8
Prop In Lane	1.00		0.79	1.00		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	455	0	417	270	284	422	97	1895	587	194	1268	695
V/C Ratio(X)	0.39	0.00	1.49	0.85	0.05	0.51	0.81	0.86	0.29	1.07	1.20	1.20
Avail Cap(c_a), veh/h	455	0	417	421	442	658	100	1895	587	194	1268	695
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	1.00	1.00
Uniform Delay (d), s/veh	49.2	0.0	59.5	66.0	57.9	62.3	74.8	46.4	35.4	75.5	50.1	50.1
Incr Delay (d2), s/veh	0.6	0.0	232.1	9.2	0.1	0.9	37.3	5.5	1.3	84.3	99.1	105.2
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(95%),veh/ln	10.9	0.0	81.6	15.9	1.0	7.9	7.9	31.1	9.5	11.8	81.8	91.8
LnGrp Delay(d),s/veh	49.8	0.0	291.6	75.2	58.0	63.2	112.1	51.9	36.7	159.8	149.2	155.3
LnGrp LOS	D		F	E	E	E	F	D	D	F	F	F
Approach Vol, veh/h		800			458			1887			2569	
Approach Delay, s/veh		237.5			69.1			53.0			152.0	
Approach LOS		F			E			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	16.0	66.6		47.0	15.8	66.8		30.4
Change Period (Y+Rc), s	7.0	7.0		6.0	7.0	7.0		6.0
Max Green Setting (Gmax), s	9.0	46.0		41.0	9.0	46.0		38.0
Max Q Clear Time (g_c+I1), s	11.0	49.6		43.0	9.0	61.8		22.1
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		1.5

Intersection Summary	
HCM 2010 Ctrl Delay	124.6
HCM 2010 LOS	F

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	101	0	6	181	326	18
Future Vol, veh/h	101	0	6	181	326	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	110	0	7	197	354	20

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	574	364	374	0	-	0
Stage 1	364	-	-	-	-	-
Stage 2	210	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	480	681	1184	-	-	-
Stage 1	703	-	-	-	-	-
Stage 2	825	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	477	681	1184	-	-	-
Mov Cap-2 Maneuver	703	-	-	-	-	-
Stage 1	703	-	-	-	-	-
Stage 2	819	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.1	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1184	-	703	-	-
HCM Lane V/C Ratio	0.006	-	0.156	-	-
HCM Control Delay (s)	8.1	0	11.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.6	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	90	0	0	97	68	308
Future Vol, veh/h	90	0	0	97	68	308
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	98	0	0	105	74	335

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	346	241	409	0	-	0
Stage 1	241	-	-	-	-	-
Stage 2	105	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	651	798	1150	-	-	-
Stage 1	799	-	-	-	-	-
Stage 2	919	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	651	798	1150	-	-	-
Mov Cap-2 Maneuver	651	-	-	-	-	-
Stage 1	799	-	-	-	-	-
Stage 2	919	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1150	-	651	-	-
HCM Lane V/C Ratio	-	-	0.15	-	-
HCM Control Delay (s)	0	-	11.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	194	1326	424	769	1307	121	508	854	438	568	1214	47
Future Volume (veh/h)	194	1326	424	769	1307	121	508	854	438	568	1214	47
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		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	204	1396	446	809	1376	127	535	899	461	598	1278	49
Adj No. of Lanes	1	3	0	2	3	0	2	3	1	2	3	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	224	1037	329	570	1472	136	452	1303	402	452	1288	49
Arrive On Green	0.13	0.27	0.27	0.17	0.31	0.31	0.13	0.26	0.26	0.13	0.26	0.26
Sat Flow, veh/h	1774	3815	1210	3442	4733	437	3442	5085	1570	3442	5025	193
Grp Volume(v), veh/h	204	1239	603	809	986	517	535	899	461	598	862	465
Grp Sat Flow(s),veh/h/ln	1774	1695	1635	1721	1695	1780	1721	1695	1570	1721	1695	1828
Q Serve(g_s), s	18.2	43.5	43.5	26.5	45.2	45.2	21.0	25.6	41.0	21.0	40.6	40.6
Cycle Q Clear(g_c), s	18.2	43.5	43.5	26.5	45.2	45.2	21.0	25.6	41.0	21.0	40.6	40.6
Prop In Lane	1.00		0.74	1.00		0.25	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	224	922	445	570	1054	554	452	1303	402	452	869	468
V/C Ratio(X)	0.91	1.34	1.36	1.42	0.93	0.93	1.18	0.69	1.15	1.32	0.99	0.99
Avail Cap(c_a), veh/h	238	922	445	570	1054	554	452	1303	402	452	869	468
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.78	0.78	0.78	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	69.0	58.3	58.3	66.7	53.5	53.5	69.5	53.8	59.5	69.5	59.3	59.3
Incr Delay (d2), s/veh	34.0	162.3	174.3	196.7	12.1	19.6	103.5	3.0	90.9	160.5	28.7	39.8
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(95%),veh/ln	16.5	74.0	74.1	50.7	29.9	32.6	29.6	18.1	50.3	36.1	30.3	34.0
LnGrp Delay(d),s/veh	102.9	220.6	232.6	263.4	65.6	73.1	173.0	56.8	150.4	230.0	88.1	99.1
LnGrp LOS	F	F	F	F	E	E	F	E	F	F	F	F
Approach Vol, veh/h		2046			2312			1895			1925	
Approach Delay, s/veh		212.4			136.5			112.4			134.8	
Approach LOS		F			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	28.0	49.0	33.0	50.0	28.0	49.0	26.7	56.3
Change Period (Y+Rc), s	7.0	8.0	6.5	6.5	7.0	8.0	6.5	6.5
Max Green Setting (Gmax), s	21.0	41.0	26.5	43.5	21.0	41.0	21.5	48.5
Max Q Clear Time (g_c+I1), s	23.0	43.0	28.5	45.5	23.0	42.6	20.2	47.2
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.3

Intersection Summary	
HCM 2010 Ctrl Delay	149.5
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	2000	289	52	1720	0	234	0	42	184	5	194
Future Volume (veh/h)	0	2000	289	52	1720	0	234	0	42	184	5	194
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	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	0	1863	1863	1863	1863	0	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	0	2174	314	57	1870	0	227	38	46	200	5	211
Adj No. of Lanes	0	3	1	1	3	0	2	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0	2	2	2	2	2	2
Cap, veh/h	0	3024	926	137	3332	0	283	61	74	264	7	241
Arrive On Green	0.00	0.79	0.79	0.02	0.66	0.00	0.08	0.08	0.08	0.15	0.15	0.15
Sat Flow, veh/h	0	5253	1557	1774	5253	0	3548	768	930	1733	43	1583
Grp Volume(v), veh/h	0	2174	314	57	1870	0	227	0	84	205	0	211
Grp Sat Flow(s),veh/h/ln	0	1695	1557	1774	1695	0	1774	0	1699	1776	0	1583
Q Serve(g_s), s	0.0	33.2	9.2	2.0	32.1	0.0	10.1	0.0	7.7	17.7	0.0	20.9
Cycle Q Clear(g_c), s	0.0	33.2	9.2	2.0	32.1	0.0	10.1	0.0	7.7	17.7	0.0	20.9
Prop In Lane	0.00		1.00	1.00		0.00	1.00		0.55	0.98		1.00
Lane Grp Cap(c), veh/h	0	3024	926	137	3332	0	283	0	136	271	0	241
V/C Ratio(X)	0.00	0.72	0.34	0.42	0.56	0.00	0.80	0.00	0.62	0.76	0.00	0.87
Avail Cap(c_a), veh/h	0	3024	926	229	3332	0	421	0	202	389	0	346
HCM Platoon Ratio	1.00	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.09	0.09	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	10.3	7.7	18.1	15.0	0.0	72.4	0.0	71.3	65.0	0.0	66.3
Incr Delay (d2), s/veh	0.0	0.1	0.1	2.0	0.7	0.0	6.6	0.0	4.5	5.1	0.0	15.7
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(95%),veh/ln	0.0	17.0	4.9	1.9	21.5	0.0	9.0	0.0	6.8	14.0	0.0	15.4
LnGrp Delay(d),s/veh	0.0	10.4	7.8	20.1	15.7	0.0	79.0	0.0	75.8	70.1	0.0	82.0
LnGrp LOS		B	A	C	B		E		E	E		F
Approach Vol, veh/h		2488			1927			311			416	
Approach Delay, s/veh		10.1			15.9			78.1			76.1	
Approach LOS		B			B			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		110.8		18.8	9.7	101.1		30.4
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s		88.0		19.0	12.0	70.0		35.0
Max Q Clear Time (g_c+I1), s		34.1		12.1	4.0	35.2		22.9
Green Ext Time (p_c), s		51.7		0.7	0.1	33.9		1.5

Intersection Summary	
HCM 2010 Ctrl Delay	21.7
HCM 2010 LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	2004	70	169	1696	65	66	23	178	0	0	0
Future Volume (veh/h)	96	2004	70	169	1696	65	66	23	178	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863			
Adj Flow Rate, veh/h	101	2109	74	178	1785	68	46	55	187			
Adj No. of Lanes	1	3	1	2	3	1	1	1	1			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2			
Cap, veh/h	122	2610	802	224	2590	798	444	466	395			
Arrive On Green	0.07	0.51	0.51	0.07	0.51	0.51	0.25	0.25	0.25			
Sat Flow, veh/h	1774	5085	1562	3442	5085	1566	1774	1863	1581			
Grp Volume(v), veh/h	101	2109	74	178	1785	68	46	55	187			
Grp Sat Flow(s),veh/h/ln	1774	1695	1562	1721	1695	1566	1774	1863	1581			
Q Serve(g_s), s	9.0	55.2	3.9	8.2	42.5	3.6	3.2	3.7	16.1			
Cycle Q Clear(g_c), s	9.0	55.2	3.9	8.2	42.5	3.6	3.2	3.7	16.1			
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	122	2610	802	224	2590	798	444	466	395			
V/C Ratio(X)	0.82	0.81	0.09	0.79	0.69	0.09	0.10	0.12	0.47			
Avail Cap(c_a), veh/h	266	2733	839	344	2590	798	444	466	395			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	73.5	32.4	19.9	73.7	29.7	20.1	46.2	46.4	51.0			
Incr Delay (d2), s/veh	12.9	1.8	0.0	7.0	1.5	0.2	0.5	0.5	4.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(95%),veh/ln	8.5	34.6	3.0	7.4	27.6	2.9	2.9	3.5	11.9			
LnGrp Delay(d),s/veh	86.4	34.2	19.9	80.7	31.2	20.3	46.7	46.9	55.1			
LnGrp LOS	F	C	B	F	C	C	D	D	E			
Approach Vol, veh/h		2284			2031			288				
Approach Delay, s/veh		36.0			35.2			52.2				
Approach LOS		D			D			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4			7	8
Phs Duration (G+Y+Rc), s		46.0	16.4	88.1			17.0	87.5
Change Period (Y+Rc), s		6.0	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s		40.0	16.0	86.0			24.0	78.0
Max Q Clear Time (g_c+I1), s		18.1	10.2	57.2			11.0	44.5
Green Ext Time (p_c), s		1.0	0.3	24.9			0.2	32.2

Intersection Summary	
HCM 2010 Ctrl Delay	36.7
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	101	0	6	175	334	18
Future Vol, veh/h	101	0	6	175	334	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	110	0	7	190	363	20

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	576	373	383	0	-	0
Stage 1	373	-	-	-	-	-
Stage 2	203	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	479	673	1175	-	-	-
Stage 1	696	-	-	-	-	-
Stage 2	831	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	476	673	1175	-	-	-
Mov Cap-2 Maneuver	696	-	-	-	-	-
Stage 1	696	-	-	-	-	-
Stage 2	825	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.1	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1175	-	696	-	-
HCM Lane V/C Ratio	0.006	-	0.158	-	-
HCM Control Delay (s)	8.1	0	11.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.6	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	70	20	0	111	80	236
Future Vol, veh/h	70	20	0	111	80	236
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	76	22	0	121	87	257

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	336	215	343	0	-	0
Stage 1	215	-	-	-	-	-
Stage 2	121	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	659	825	1216	-	-	-
Stage 1	821	-	-	-	-	-
Stage 2	904	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	659	825	1216	-	-	-
Mov Cap-2 Maneuver	821	-	-	-	-	-
Stage 1	821	-	-	-	-	-
Stage 2	904	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1216	-	822	-	-
HCM Lane V/C Ratio	-	-	0.119	-	-
HCM Control Delay (s)	0	-	10	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	188	1432	423	712	1575	206	712	1215	435	477	1295	81
Future Volume (veh/h)	188	1432	423	712	1575	206	712	1215	435	477	1295	81
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		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	198	1507	445	749	1658	217	749	1279	458	502	1363	85
Adj No. of Lanes	1	3	0	2	3	0	2	3	1	2	3	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	219	1109	324	462	1344	175	495	1335	411	495	1284	80
Arrive On Green	0.12	0.28	0.28	0.27	0.59	0.59	0.14	0.26	0.26	0.14	0.26	0.26
Sat Flow, veh/h	1774	3901	1139	3442	4547	593	3442	5085	1565	3442	4891	305
Grp Volume(v), veh/h	198	1307	645	749	1235	640	749	1279	458	502	945	503
Grp Sat Flow(s),veh/h/ln	1774	1695	1650	1721	1695	1750	1721	1695	1565	1721	1695	1806
Q Serve(g_s), s	17.6	45.5	45.5	21.5	47.3	47.3	23.0	39.7	42.0	23.0	42.0	42.0
Cycle Q Clear(g_c), s	17.6	45.5	45.5	21.5	47.3	47.3	23.0	39.7	42.0	23.0	42.0	42.0
Prop In Lane	1.00		0.69	1.00		0.34	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	219	964	469	462	1002	517	495	1335	411	495	890	474
V/C Ratio(X)	0.91	1.36	1.37	1.62	1.23	1.24	1.51	0.96	1.11	1.01	1.06	1.06
Avail Cap(c_a), veh/h	238	964	469	462	1002	517	495	1335	411	495	890	474
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.63	0.63	0.63	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	69.2	57.3	57.3	58.5	32.7	32.7	68.5	58.1	59.0	68.5	59.0	59.0
Incr Delay (d2), s/veh	32.7	167.0	181.3	285.0	110.3	117.7	241.5	16.5	79.3	44.2	47.9	58.6
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(95%),veh/ln	16.0	78.6	79.9	51.2	66.7	70.7	49.5	28.1	49.0	25.1	46.0	51.6
LnGrp Delay(d),s/veh	101.9	224.3	238.5	343.5	143.0	150.4	310.0	74.6	138.3	112.7	106.9	117.6
LnGrp LOS	F	F	F	F	F	F	F	E	F	F	F	F
Approach Vol, veh/h		2150			2624			2486			1950	
Approach Delay, s/veh		217.3			202.1			157.3			111.2	
Approach LOS		F			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.0	50.0	28.0	52.0	30.0	50.0	26.2	53.8
Change Period (Y+Rc), s	7.0	8.0	6.5	6.5	7.0	8.0	6.5	6.5
Max Green Setting (Gmax), s	23.0	42.0	21.5	45.5	23.0	42.0	21.5	45.5
Max Q Clear Time (g_c+I1), s	25.0	44.0	23.5	47.5	25.0	44.0	19.6	49.3
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	174.3
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1935	265	67	2310	0	164	0	85	152	4	127
Future Volume (veh/h)	0	1935	265	67	2310	0	164	0	85	152	4	127
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	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	0	1863	1863	1863	1863	0	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	0	2037	279	71	2432	0	131	59	89	160	4	134
Adj No. of Lanes	0	3	1	1	3	0	1	1	0	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	0	2	2	2	2	2	2
Cap, veh/h	0	3106	943	188	3431	0	181	68	103	192	5	176
Arrive On Green	0.00	1.00	1.00	0.03	0.67	0.00	0.10	0.10	0.10	0.11	0.11	0.11
Sat Flow, veh/h	0	5253	1543	1774	5253	0	1774	670	1011	1733	43	1583
Grp Volume(v), veh/h	0	2037	279	71	2432	0	131	0	148	164	0	134
Grp Sat Flow(s),veh/h/ln	0	1695	1543	1774	1695	0	1774	0	1681	1776	0	1583
Q Serve(g_s), s	0.0	0.0	0.0	2.3	47.7	0.0	11.5	0.0	13.9	14.5	0.0	13.2
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.3	47.7	0.0	11.5	0.0	13.9	14.5	0.0	13.2
Prop In Lane	0.00		1.00	1.00		0.00	1.00		0.60	0.98		1.00
Lane Grp Cap(c), veh/h	0	3106	943	188	3431	0	181	0	171	197	0	176
V/C Ratio(X)	0.00	0.66	0.30	0.38	0.71	0.00	0.72	0.00	0.86	0.83	0.00	0.76
Avail Cap(c_a), veh/h	0	3106	943	274	3431	0	211	0	200	389	0	346
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.09	0.09	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	10.2	16.2	0.0	69.7	0.0	70.8	69.7	0.0	69.1
Incr Delay (d2), s/veh	0.0	0.1	0.1	1.3	1.3	0.0	9.9	0.0	27.5	8.8	0.0	6.7
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(95%),veh/ln	0.0	0.1	0.0	2.2	30.2	0.0	10.2	0.0	12.3	12.1	0.0	10.1
LnGrp Delay(d),s/veh	0.0	0.1	0.1	11.5	17.5	0.0	79.6	0.0	98.2	78.5	0.0	75.8
LnGrp LOS		A	A	B	B		E		F	E		E
Approach Vol, veh/h		2316			2503			279			298	
Approach Delay, s/veh		0.1			17.3			89.5			77.3	
Approach LOS		A			B			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		114.0		22.3	10.2	103.7		23.7
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s		88.0		19.0	12.0	70.0		35.0
Max Q Clear Time (g_c+I1), s		49.7		15.9	4.3	2.0		16.5
Green Ext Time (p_c), s		37.7		0.4	0.1	66.2		1.3

Intersection Summary	
HCM 2010 Ctrl Delay	17.0
HCM 2010 LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	143	1996	86	317	2140	110	200	211	403	0	0	0
Future Volume (veh/h)	143	1996	86	317	2140	110	200	211	403	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.97			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863			
Adj Flow Rate, veh/h	152	2123	91	337	2277	117	213	224	429			
Adj No. of Lanes	1	3	1	2	3	1	1	1	1			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94			
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2			
Cap, veh/h	175	2493	749	344	2499	753	444	466	386			
Arrive On Green	0.10	0.49	0.49	0.10	0.49	0.49	0.25	0.25	0.25			
Sat Flow, veh/h	1774	5085	1528	3442	5085	1532	1774	1863	1543			
Grp Volume(v), veh/h	152	2123	91	337	2277	117	213	224	429			
Grp Sat Flow(s),veh/h/ln	1774	1695	1528	1721	1695	1532	1774	1863	1543			
Q Serve(g_s), s	13.5	58.5	5.2	15.6	66.0	6.7	16.4	16.4	40.0			
Cycle Q Clear(g_c), s	13.5	58.5	5.2	15.6	66.0	6.7	16.4	16.4	40.0			
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	175	2493	749	344	2499	753	444	466	386			
V/C Ratio(X)	0.87	0.85	0.12	0.98	0.91	0.16	0.48	0.48	1.11			
Avail Cap(c_a), veh/h	333	2733	822	344	2499	753	444	466	386			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	71.1	35.7	22.1	71.8	37.5	22.4	51.1	51.2	60.0			
Incr Delay (d2), s/veh	12.0	2.6	0.1	42.8	6.4	0.4	3.7	3.5	79.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(95%),veh/ln	11.6	36.6	3.9	14.5	41.6	5.3	13.3	13.8	46.0			
LnGrp Delay(d),s/veh	83.1	38.3	22.2	114.6	43.9	22.9	54.8	54.7	139.6			
LnGrp LOS	F	D	C	F	D	C	D	D	F			
Approach Vol, veh/h		2366			2731			866				
Approach Delay, s/veh		40.5			51.7			96.8				
Approach LOS		D			D			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4			7	8
Phs Duration (G+Y+Rc), s		46.0	22.0	84.4			21.8	84.6
Change Period (Y+Rc), s		6.0	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s		40.0	16.0	86.0			30.0	72.0
Max Q Clear Time (g_c+I1), s		42.0	17.6	60.5			15.5	68.0
Green Ext Time (p_c), s		0.0	0.0	18.0			0.3	4.0

Intersection Summary	
HCM 2010 Ctrl Delay	53.8
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	176	65	167	394	83	284	137	1698	216	277	1932	14
Future Volume (veh/h)	176	65	167	394	83	284	137	1698	216	277	1932	14
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		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	185	68	176	415	87	299	144	1787	227	292	2034	15
Adj No. of Lanes	1	1	0	1	1	2	1	3	1	2	3	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	315	81	210	421	442	658	165	1655	511	335	1717	13
Arrive On Green	0.18	0.18	0.18	0.24	0.24	0.24	0.09	0.33	0.33	0.10	0.33	0.33
Sat Flow, veh/h	1774	457	1183	1774	1863	2769	1774	5085	1570	3442	5207	38
Grp Volume(v), veh/h	185	0	244	415	87	299	144	1787	227	292	1324	725
Grp Sat Flow(s),veh/h/ln	1774	0	1640	1774	1863	1385	1774	1695	1570	1721	1695	1855
Q Serve(g_s), s	15.3	0.0	23.0	37.3	6.0	14.8	12.8	52.1	18.2	13.4	52.8	52.8
Cycle Q Clear(g_c), s	15.3	0.0	23.0	37.3	6.0	14.8	12.8	52.1	18.2	13.4	52.8	52.8
Prop In Lane	1.00		0.72	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	315	0	291	421	442	658	165	1655	511	335	1118	612
V/C Ratio(X)	0.59	0.00	0.84	0.98	0.20	0.45	0.87	1.08	0.44	0.87	1.18	1.19
Avail Cap(c_a), veh/h	444	0	410	421	442	658	188	1655	511	366	1118	612
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	1.00	1.00
Uniform Delay (d), s/veh	60.4	0.0	63.6	60.7	48.8	52.1	71.6	54.0	42.6	71.2	53.6	53.6
Incr Delay (d2), s/veh	1.7	0.0	10.3	39.7	0.2	0.5	30.8	47.2	2.8	18.9	92.3	99.2
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(95%),veh/ln	12.2	0.0	16.8	30.7	5.6	9.6	12.2	56.9	13.1	11.7	70.2	79.0
LnGrp Delay(d),s/veh	62.2	0.0	73.9	100.5	49.0	52.6	102.5	101.2	45.4	90.1	146.0	152.9
LnGrp LOS	E		E	F	D	D	F	F	D	F	F	F
Approach Vol, veh/h		429			801			2158			2341	
Approach Delay, s/veh		68.9			77.0			95.4			141.1	
Approach LOS		E			E			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	22.6	59.1		34.4	21.9	59.8		44.0
Change Period (Y+Rc), s	7.0	7.0		6.0	7.0	7.0		6.0
Max Green Setting (Gmax), s	17.0	39.0		40.0	17.0	39.0		38.0
Max Q Clear Time (g_c+I1), s	15.4	54.1		25.0	14.8	54.8		39.3
Green Ext Time (p_c), s	0.2	0.0		1.8	0.1	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	109.5
HCM 2010 LOS	F

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	22	21	14	227	295	41
Future Vol, veh/h	22	21	14	227	295	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	23	15	247	321	45

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	620	343	365	0	-	0
Stage 1	343	-	-	-	-	-
Stage 2	277	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	452	700	1194	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	770	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	445	700	1194	-	-	-
Mov Cap-2 Maneuver	719	-	-	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	758	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.4	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1194	-	710	-	-
HCM Lane V/C Ratio	0.013	-	0.066	-	-
HCM Control Delay (s)	8.1	0	10.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	227	79	0	14	62	254
Future Vol, veh/h	227	79	0	14	62	254
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	247	86	0	15	67	276

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	220	205	343	0	-	0
Stage 1	205	-	-	-	-	-
Stage 2	15	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	768	836	1216	-	-	-
Stage 1	829	-	-	-	-	-
Stage 2	1008	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	768	836	1216	-	-	-
Mov Cap-2 Maneuver	829	-	-	-	-	-
Stage 1	829	-	-	-	-	-
Stage 2	1008	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1216	-	831	-	-
HCM Lane V/C Ratio	-	-	0.4	-	-
HCM Control Delay (s)	0	-	12.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	1.9	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	188	1432	423	844	1575	206	712	1215	435	477	1295	81
Future Volume (veh/h)	188	1432	423	844	1575	206	712	1215	435	477	1295	81
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		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	198	1507	445	888	1658	217	749	1279	458	502	1363	85
Adj No. of Lanes	1	3	0	2	3	0	2	3	1	2	3	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	219	1109	324	462	1344	175	495	1335	411	495	1284	80
Arrive On Green	0.12	0.28	0.28	0.27	0.59	0.59	0.14	0.26	0.26	0.14	0.26	0.26
Sat Flow, veh/h	1774	3901	1139	3442	4547	593	3442	5085	1565	3442	4891	305
Grp Volume(v), veh/h	198	1307	645	888	1235	640	749	1279	458	502	945	503
Grp Sat Flow(s),veh/h/ln	1774	1695	1650	1721	1695	1750	1721	1695	1565	1721	1695	1806
Q Serve(g_s), s	17.6	45.5	45.5	21.5	47.3	47.3	23.0	39.7	42.0	23.0	42.0	42.0
Cycle Q Clear(g_c), s	17.6	45.5	45.5	21.5	47.3	47.3	23.0	39.7	42.0	23.0	42.0	42.0
Prop In Lane	1.00		0.69	1.00		0.34	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	219	964	469	462	1002	517	495	1335	411	495	890	474
V/C Ratio(X)	0.91	1.36	1.37	1.92	1.23	1.24	1.51	0.96	1.11	1.01	1.06	1.06
Avail Cap(c_a), veh/h	238	964	469	462	1002	517	495	1335	411	495	890	474
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.62	0.62	0.62	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	69.2	57.3	57.3	58.5	32.7	32.7	68.5	58.1	59.0	68.5	59.0	59.0
Incr Delay (d2), s/veh	32.7	167.0	181.3	419.0	110.2	117.6	241.5	16.5	79.3	44.2	47.9	58.6
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(95%),veh/ln	16.0	78.6	79.9	66.7	66.6	70.7	49.5	28.1	49.0	25.1	46.0	51.6
LnGrp Delay(d),s/veh	101.9	224.3	238.5	477.5	142.9	150.3	310.0	74.6	138.3	112.7	106.9	117.6
LnGrp LOS	F	F	F	F	F	F	F	E	F	F	F	F
Approach Vol, veh/h		2150			2763			2486			1950	
Approach Delay, s/veh		217.3			252.2			157.3			111.2	
Approach LOS		F			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.0	50.0	28.0	52.0	30.0	50.0	26.2	53.8
Change Period (Y+Rc), s	7.0	8.0	6.5	6.5	7.0	8.0	6.5	6.5
Max Green Setting (Gmax), s	23.0	42.0	21.5	45.5	23.0	42.0	21.5	45.5
Max Q Clear Time (g_c+I1), s	25.0	44.0	23.5	47.5	25.0	44.0	19.6	49.3
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	189.5
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1935	265	67	2212	0	394	0	85	152	4	127
Future Volume (veh/h)	0	1935	265	67	2212	0	394	0	85	152	4	127
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	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	0	1863	1863	1863	1863	0	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	0	2037	279	71	2328	0	376	55	89	160	4	134
Adj No. of Lanes	0	3	1	1	3	0	2	1	0	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	0	2	2	2	2	2	2
Cap, veh/h	0	3023	917	186	3351	0	417	75	122	192	5	176
Arrive On Green	0.00	1.00	1.00	0.03	0.66	0.00	0.12	0.12	0.12	0.11	0.11	0.11
Sat Flow, veh/h	0	5253	1542	1774	5253	0	3548	640	1036	1733	43	1583
Grp Volume(v), veh/h	0	2037	279	71	2328	0	376	0	144	164	0	134
Grp Sat Flow(s),veh/h/ln	0	1695	1542	1774	1695	0	1774	0	1677	1776	0	1583
Q Serve(g_s), s	0.0	0.0	0.0	2.4	46.1	0.0	16.7	0.0	13.3	14.5	0.0	13.2
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.4	46.1	0.0	16.7	0.0	13.3	14.5	0.0	13.2
Prop In Lane	0.00		1.00	1.00		0.00	1.00		0.62	0.98		1.00
Lane Grp Cap(c), veh/h	0	3023	917	186	3351	0	417	0	197	197	0	176
V/C Ratio(X)	0.00	0.67	0.30	0.38	0.69	0.00	0.90	0.00	0.73	0.83	0.00	0.76
Avail Cap(c_a), veh/h	0	3023	917	271	3351	0	421	0	199	389	0	346
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.09	0.09	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	11.2	17.2	0.0	69.7	0.0	68.1	69.7	0.0	69.1
Incr Delay (d2), s/veh	0.0	0.1	0.1	1.3	1.2	0.0	21.9	0.0	12.7	8.8	0.0	6.7
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(95%),veh/ln	0.0	0.1	0.0	2.2	29.4	0.0	14.5	0.0	11.1	12.1	0.0	10.1
LnGrp Delay(d),s/veh	0.0	0.1	0.1	12.5	18.4	0.0	91.6	0.0	80.8	78.5	0.0	75.8
LnGrp LOS		A	A	B	B		F		F	E		E
Approach Vol, veh/h		2316			2399			520			298	
Approach Delay, s/veh		0.1			18.2			88.6			77.3	
Approach LOS		A			B			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		111.4		24.8	10.3	101.1		23.7
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s		88.0		19.0	12.0	70.0		35.0
Max Q Clear Time (g_c+I1), s		48.1		18.7	4.4	2.0		16.5
Green Ext Time (p_c), s		39.2		0.1	0.1	65.9		1.3

Intersection Summary	
HCM 2010 Ctrl Delay	20.4
HCM 2010 LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	143	1996	86	317	2140	110	102	211	403	0	0	0
Future Volume (veh/h)	143	1996	86	317	2140	110	102	211	403	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.97			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863			
Adj Flow Rate, veh/h	152	2123	91	337	2277	117	109	224	429			
Adj No. of Lanes	1	3	1	2	3	1	1	1	1			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94			
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2			
Cap, veh/h	175	2493	749	344	2499	753	444	466	386			
Arrive On Green	0.10	0.49	0.49	0.10	0.49	0.49	0.25	0.25	0.25			
Sat Flow, veh/h	1774	5085	1528	3442	5085	1532	1774	1863	1543			
Grp Volume(v), veh/h	152	2123	91	337	2277	117	109	224	429			
Grp Sat Flow(s),veh/h/ln	1774	1695	1528	1721	1695	1532	1774	1863	1543			
Q Serve(g_s), s	13.5	58.5	5.2	15.6	66.0	6.7	7.9	16.4	40.0			
Cycle Q Clear(g_c), s	13.5	58.5	5.2	15.6	66.0	6.7	7.9	16.4	40.0			
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	175	2493	749	344	2499	753	444	466	386			
V/C Ratio(X)	0.87	0.85	0.12	0.98	0.91	0.16	0.25	0.48	1.11			
Avail Cap(c_a), veh/h	333	2733	822	344	2499	753	444	466	386			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	71.1	35.7	22.1	71.8	37.5	22.4	47.9	51.2	60.0			
Incr Delay (d2), s/veh	12.0	2.6	0.1	42.8	6.4	0.4	1.3	3.5	79.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(95%),veh/ln	11.6	36.6	3.9	14.5	41.6	5.3	7.2	13.8	46.0			
LnGrp Delay(d),s/veh	83.1	38.3	22.2	114.6	43.9	22.9	49.3	54.7	139.6			
LnGrp LOS	F	D	C	F	D	C	D	D	F			
Approach Vol, veh/h		2366			2731			762				
Approach Delay, s/veh		40.5			51.7			101.7				
Approach LOS		D			D			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4			7	8
Phs Duration (G+Y+Rc), s		46.0	22.0	84.4			21.8	84.6
Change Period (Y+Rc), s		6.0	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s		40.0	16.0	86.0			30.0	72.0
Max Q Clear Time (g_c+I1), s		42.0	17.6	60.5			15.5	68.0
Green Ext Time (p_c), s		0.0	0.0	18.0			0.3	4.0

Intersection Summary	
HCM 2010 Ctrl Delay	53.7
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	176	65	167	277	78	284	137	1698	216	277	2059	19
Future Volume (veh/h)	176	65	167	277	78	284	137	1698	216	277	2059	19
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		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	185	68	176	292	82	299	144	1787	227	292	2167	20
Adj No. of Lanes	1	1	0	1	1	2	1	3	1	2	3	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	315	81	210	336	352	523	165	1900	587	335	1964	18
Arrive On Green	0.18	0.18	0.18	0.19	0.19	0.19	0.09	0.37	0.37	0.10	0.38	0.38
Sat Flow, veh/h	1774	457	1183	1774	1863	2765	1774	5085	1572	3442	5195	48
Grp Volume(v), veh/h	185	0	244	292	82	299	144	1787	227	292	1413	774
Grp Sat Flow(s),veh/h/ln	1774	0	1640	1774	1863	1382	1774	1695	1572	1721	1695	1853
Q Serve(g_s), s	15.3	0.0	23.0	25.6	6.0	15.7	12.8	54.3	16.9	13.4	60.5	60.5
Cycle Q Clear(g_c), s	15.3	0.0	23.0	25.6	6.0	15.7	12.8	54.3	16.9	13.4	60.5	60.5
Prop In Lane	1.00		0.72	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	315	0	291	336	352	523	165	1900	587	335	1282	701
V/C Ratio(X)	0.59	0.00	0.84	0.87	0.23	0.57	0.87	0.94	0.39	0.87	1.10	1.10
Avail Cap(c_a), veh/h	444	0	410	421	442	657	188	1900	587	366	1282	701
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	1.00	1.00
Uniform Delay (d), s/veh	60.4	0.0	63.6	63.0	55.0	59.0	71.6	48.4	36.7	71.2	49.8	49.8
Incr Delay (d2), s/veh	1.7	0.0	10.3	14.9	0.3	1.0	30.8	10.7	1.9	18.9	58.3	66.2
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(95%),veh/ln	12.2	0.0	16.8	20.1	5.6	10.1	12.2	35.9	12.2	11.7	69.6	78.9
LnGrp Delay(d),s/veh	62.2	0.0	73.9	77.8	55.3	60.0	102.5	59.1	38.6	90.1	108.0	116.0
LnGrp LOS	E		E	E	E	E	F	E	D	F	F	F
Approach Vol, veh/h		429			673			2158			2479	
Approach Delay, s/veh		68.9			67.1			59.8			108.4	
Approach LOS		E			E			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	22.6	66.8		34.4	21.9	67.5		36.3
Change Period (Y+Rc), s	7.0	7.0		6.0	7.0	7.0		6.0
Max Green Setting (Gmax), s	17.0	39.0		40.0	17.0	39.0		38.0
Max Q Clear Time (g_c+I1), s	15.4	56.3		25.0	14.8	62.5		27.6
Green Ext Time (p_c), s	0.2	0.0		1.8	0.1	0.0		2.0

Intersection Summary	
HCM 2010 Ctrl Delay	82.3
HCM 2010 LOS	F

Intersection	
Int Delay, s/veh	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	43	0	14	436	295	41
Future Vol, veh/h	43	0	14	436	295	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	47	0	15	474	321	45

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	847	343	365	0	-	0
Stage 1	343	-	-	-	-	-
Stage 2	504	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	332	700	1194	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	607	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	326	700	1194	-	-	-
Mov Cap-2 Maneuver	~	-	-	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	597	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	~	0.3	0
HCM LOS	N		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1194	-	~	-	-
HCM Lane V/C Ratio	0.013	-	-	-	-
HCM Control Delay (s)	8.1	0	+	-	-
HCM Lane LOS	A	A	+	-	-
HCM 95th %tile Q(veh)	0	-		-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	306	0	0	144	62	254
Future Vol, veh/h	306	0	0	144	62	254
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	333	0	0	157	67	276

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	362	205	343	0	-	0
Stage 1	205	-	-	-	-	-
Stage 2	157	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	637	836	1216	-	-	-
Stage 1	829	-	-	-	-	-
Stage 2	871	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	637	836	1216	-	-	-
Mov Cap-2 Maneuver	829	-	-	-	-	-
Stage 1	829	-	-	-	-	-
Stage 2	871	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1216	-	829	-	-
HCM Lane V/C Ratio	-	-	0.401	-	-
HCM Control Delay (s)	0	-	12.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	1.9	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	188	1432	423	844	1575	206	723	1215	468	477	1295	81
Future Volume (veh/h)	188	1432	423	844	1575	206	723	1215	468	477	1295	81
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		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	198	1507	445	888	1658	217	761	1279	493	502	1363	85
Adj No. of Lanes	1	3	0	2	3	0	2	3	1	2	3	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	219	1109	324	462	1344	175	495	1335	411	495	1284	80
Arrive On Green	0.12	0.28	0.28	0.27	0.59	0.59	0.14	0.26	0.26	0.14	0.26	0.26
Sat Flow, veh/h	1774	3901	1139	3442	4547	593	3442	5085	1565	3442	4891	305
Grp Volume(v), veh/h	198	1307	645	888	1235	640	761	1279	493	502	945	503
Grp Sat Flow(s),veh/h/ln	1774	1695	1650	1721	1695	1750	1721	1695	1565	1721	1695	1806
Q Serve(g_s), s	17.6	45.5	45.5	21.5	47.3	47.3	23.0	39.7	42.0	23.0	42.0	42.0
Cycle Q Clear(g_c), s	17.6	45.5	45.5	21.5	47.3	47.3	23.0	39.7	42.0	23.0	42.0	42.0
Prop In Lane	1.00		0.69	1.00		0.34	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	219	964	469	462	1002	517	495	1335	411	495	890	474
V/C Ratio(X)	0.91	1.36	1.37	1.92	1.23	1.24	1.54	0.96	1.20	1.01	1.06	1.06
Avail Cap(c_a), veh/h	238	964	469	462	1002	517	495	1335	411	495	890	474
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.62	0.62	0.62	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	69.2	57.3	57.3	58.5	32.7	32.7	68.5	58.1	59.0	68.5	59.0	59.0
Incr Delay (d2), s/veh	32.7	167.0	181.3	419.0	110.2	117.6	252.2	16.5	111.2	44.2	47.9	58.6
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(95%),veh/ln	16.0	78.6	79.9	66.7	66.6	70.7	50.9	28.1	55.5	25.1	46.0	51.6
LnGrp Delay(d),s/veh	101.9	224.3	238.5	477.5	143.0	150.3	320.7	74.6	170.2	112.7	106.9	117.6
LnGrp LOS	F	F	F	F	F	F	F	E	F	F	F	F
Approach Vol, veh/h		2150			2763			2533			1950	
Approach Delay, s/veh		217.3			252.2			167.1			111.2	
Approach LOS		F			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.0	50.0	28.0	52.0	30.0	50.0	26.2	53.8
Change Period (Y+Rc), s	7.0	8.0	6.5	6.5	7.0	8.0	6.5	6.5
Max Green Setting (Gmax), s	23.0	42.0	21.5	45.5	23.0	42.0	21.5	45.5
Max Q Clear Time (g_c+I1), s	25.0	44.0	23.5	47.5	25.0	44.0	19.6	49.3
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	192.0
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1968	265	67	2241	0	365	0	81	152	4	127
Future Volume (veh/h)	0	1968	265	67	2241	0	365	0	81	152	4	127
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	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	0	1863	1863	1863	1863	0	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	0	2072	279	71	2359	0	348	50	85	160	4	134
Adj No. of Lanes	0	3	1	1	3	0	2	1	0	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	0	2	2	2	2	2	2
Cap, veh/h	0	3055	927	183	3382	0	396	69	118	192	5	176
Arrive On Green	0.00	1.00	1.00	0.03	0.67	0.00	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	0	5253	1542	1774	5253	0	3548	620	1054	1733	43	1583
Grp Volume(v), veh/h	0	2072	279	71	2359	0	348	0	135	164	0	134
Grp Sat Flow(s),veh/h/ln	0	1695	1542	1774	1695	0	1774	0	1673	1776	0	1583
Q Serve(g_s), s	0.0	0.0	0.0	2.4	46.4	0.0	15.5	0.0	12.5	14.5	0.0	13.2
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.4	46.4	0.0	15.5	0.0	12.5	14.5	0.0	13.2
Prop In Lane	0.00		1.00	1.00		0.00	1.00		0.63	0.98		1.00
Lane Grp Cap(c), veh/h	0	3055	927	183	3382	0	396	0	187	197	0	176
V/C Ratio(X)	0.00	0.68	0.30	0.39	0.70	0.00	0.88	0.00	0.72	0.83	0.00	0.76
Avail Cap(c_a), veh/h	0	3055	927	269	3382	0	421	0	199	389	0	346
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.09	0.09	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	10.8	16.7	0.0	70.0	0.0	68.7	69.7	0.0	69.1
Incr Delay (d2), s/veh	0.0	0.1	0.1	1.3	1.2	0.0	18.1	0.0	11.5	8.8	0.0	6.7
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(95%),veh/ln	0.0	0.1	0.0	2.2	29.7	0.0	13.4	0.0	10.5	12.1	0.0	10.1
LnGrp Delay(d),s/veh	0.0	0.1	0.1	12.2	18.0	0.0	88.1	0.0	80.1	78.5	0.0	75.8
LnGrp LOS		A	A	B	B		F		F	E		E
Approach Vol, veh/h		2351			2430			483			298	
Approach Delay, s/veh		0.1			17.8			85.9			77.3	
Approach LOS		A			B			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		112.4		23.9	10.3	102.1		23.7
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s		88.0		19.0	12.0	70.0		35.0
Max Q Clear Time (g_c+I1), s		48.4		17.5	4.4	2.0		16.5
Green Ext Time (p_c), s		38.9		0.4	0.1	66.1		1.3

Intersection Summary	
HCM 2010 Ctrl Delay	19.4
HCM 2010 LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	172	1996	86	317	2140	110	102	211	403	0	0	0
Future Volume (veh/h)	172	1996	86	317	2140	110	102	211	403	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.97			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863			
Adj Flow Rate, veh/h	183	2123	91	337	2277	117	109	224	429			
Adj No. of Lanes	1	3	1	2	3	1	1	1	1			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94			
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2			
Cap, veh/h	207	2539	764	344	2456	739	444	466	386			
Arrive On Green	0.12	0.50	0.50	0.10	0.48	0.48	0.25	0.25	0.25			
Sat Flow, veh/h	1774	5085	1529	3442	5085	1531	1774	1863	1543			
Grp Volume(v), veh/h	183	2123	91	337	2277	117	109	224	429			
Grp Sat Flow(s),veh/h/ln	1774	1695	1529	1721	1695	1531	1774	1863	1543			
Q Serve(g_s), s	16.3	57.4	5.1	15.6	67.1	6.8	7.9	16.4	40.0			
Cycle Q Clear(g_c), s	16.3	57.4	5.1	15.6	67.1	6.8	7.9	16.4	40.0			
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	207	2539	764	344	2456	739	444	466	386			
V/C Ratio(X)	0.89	0.84	0.12	0.98	0.93	0.16	0.25	0.48	1.11			
Avail Cap(c_a), veh/h	333	2733	822	344	2456	739	444	466	386			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	69.6	34.4	21.3	71.8	38.7	23.2	47.9	51.2	60.0			
Incr Delay (d2), s/veh	15.4	2.3	0.1	42.8	7.6	0.5	1.3	3.5	79.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(95%),veh/ln	13.7	35.8	3.9	14.5	42.6	5.4	7.2	13.8	46.0			
LnGrp Delay(d),s/veh	85.0	36.7	21.4	114.6	46.3	23.6	49.3	54.7	139.6			
LnGrp LOS	F	D	C	F	D	C	D	D	F			
Approach Vol, veh/h		2397			2731			762				
Approach Delay, s/veh		39.8			53.8			101.7				
Approach LOS		D			D			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4			7	8
Phs Duration (G+Y+Rc), s		46.0	22.0	85.9			24.6	83.3
Change Period (Y+Rc), s		6.0	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s		40.0	16.0	86.0			30.0	72.0
Max Q Clear Time (g_c+I1), s		42.0	17.6	59.4			18.3	69.1
Green Ext Time (p_c), s		0.0	0.0	20.5			0.4	2.9

Intersection Summary	
HCM 2010 Ctrl Delay	54.3
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	43	0	14	403	295	41
Future Vol, veh/h	43	0	14	403	295	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	47	0	15	438	321	45

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	811	343	365	0	-	0
Stage 1	343	-	-	-	-	-
Stage 2	468	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	349	700	1194	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	630	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	343	700	1194	-	-	-
Mov Cap-2 Maneuver	~	-	-	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	619	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	~	0.3	0
HCM LOS	N		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1194	-	~	-	-
HCM Lane V/C Ratio	0.013	-	-	-	-
HCM Control Delay (s)	8.1	0	+	-	-
HCM Lane LOS	A	A	+	-	-
HCM 95th %tile Q(veh)	0	-		-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	258	48	0	159	80	236
Future Vol, veh/h	258	48	0	159	80	236
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	280	52	0	173	87	257

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	388	215	343	0	-	0
Stage 1	215	-	-	-	-	-
Stage 2	173	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	616	825	1216	-	-	-
Stage 1	821	-	-	-	-	-
Stage 2	857	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	616	825	1216	-	-	-
Mov Cap-2 Maneuver	821	-	-	-	-	-
Stage 1	821	-	-	-	-	-
Stage 2	857	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1216	-	822	-	-
HCM Lane V/C Ratio	-	-	0.405	-	-
HCM Control Delay (s)	0	-	12.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	2	-	-

Chateau Square

Hallandale Beach, Florida

traffic study

prepared for:

Chateau Square LLC

Traf Tech
ENGINEERING, INC.

August 2015

Updated December 2015

Traf Tech
ENGINEERING, INC.

December 11, 2015

Mr. Esteban Koffsmon
Chateau Square LLC
10000 East Hallandale Beach Boulevard #B
Hallandale Beach, Florida 33009

Re: Chateau Square – Hallandale Beach, Florida
Traffic Study

Dear Esteban:

Traf Tech Engineering, Inc. is pleased to provide you with the results of the updated traffic study in connection with the proposed Chateau Square mixed-use project planned to be located on the southeast corner of East Hallandale Beach Boulevard and Federal Highway in the City of Hallandale Beach in Broward County, Florida. The revised study addresses the traffic-related comments provided by the City of Hallandale Beach's transportation consultant.

It has been a pleasure working with Chateau Square LLC on this project.

Sincerely,

TRAF TECH ENGINEERING, INC.

Joaquin E. Vargas, P.E.
Senior Transportation Engineer

JOAQUIN E. VARGAS
LICENSE
No 44174
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

December 11, 2015

8400 North University Drive, Suite 309, Tamarac, Florida 33321
Tel: (954) 582-0988 Fax: (954) 582-0989

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INTRODUCTION

Chateau Square is a mixed-use development consisting of mid-rise residential units, a hotel, office space, work-live units and retail space planned to be located on the southeast corner of the intersection of Federal Highway and East Hallandale Beach Boulevard in the City of Hallandale Beach in Broward County, Florida. Figure 1 on the following page shows the location of the project site as well as the transportation network located in the immediate vicinity of the project site.

Traf Tech Engineering, Inc. was retained by Chateau Group LLC to conduct a traffic study[1] in connection with the proposed mixed-use development. The study addresses trip generation, access to the site, the traffic impacts on the nearby transportation network, and potential roadway improvement intended to mitigate the new trips generated by the project, if any.

This study is divided into seven (7) sections, as listed below:

1. Inventory
2. Existing Conditions
3. Traffic Counts
4. Trip Generation
5. Trip Distribution and Traffic Assignment
6. Traffic Analysis
7. Conclusions

[1] The traffic methodology was discussed and agreed with the City of Hallandale Beach staff and its transportation Consultant (Kittelson and Associates). The agreed-upon traffic methodology is contained in Appendix A

Traf Tech
ENGINEERING, INC.

PROJECT LOCATION MAP

FIGURE 1
Chateau Square
Hallandale Beach, Florida

INVENTORY

Existing Land Use and Access

The project site is currently developed with 60,609 square feet of retail space. Access to the existing development is provided via a right-turn in/right-turn out driveway off of Federal Highway and through Hibiscus Street and NE 8th Avenue.

Proposed Land Uses and Access

The existing site will be redeveloped with the following land uses and intensity:

- 137,384 square feet of leasable retail/commercial use
- 280 hotel rooms
- 691 high-rise residential units
- 152,792 square feet of gross office space
- 36 work/live units

Access to the project's proposed parking structure will consist of the following:

- One full access driveway on NE 8th Avenue (for residents only) – N. Driveway
- One full access driveway on NE 8th Avenue (for commercial uses) – S. Driveway
- One full access driveway on Hibiscus St. (for commercial uses) – W. Driveway
- One full access driveway on Hibiscus St. (for residents only) – E. Driveway

Additionally, four (4) valet drop-off and pick-up locations (one on Federal Highway, one on East Hallandale Beach Boulevard and two (2) on NE 8th Avenue) are proposed for the project. The two drop-off/pick-up valet stations on the State Roadways (Federal Highway and East Hallandale Beach Boulevard) have been reviewed and approved by the FDOT. The subject approval letter is contained in Appendix B.

For purposes of this traffic study, the project is anticipated to be built and occupied by the year 2022. Appendix C contains a copy of the proposed site plan for the Chateau Square project.

EXISTING CONDITIONS

This section addresses the roadway system surrounding the project site and intersections.

Roadway System

The immediate transportation network located in the vicinity of the project site includes two major roadways (Federal Highway and Hallandale Beach Boulevard), a County collector roadway (Dixie Highway/SE-NE 1st Avenue), and seven local streets (Atlantic Shores, NE 3rd Street, Hibiscus Street, SE 3rd Street, NE 8th Avenue, NE 10th Avenue and NE 14th Avenue. Hallandale Beach Boulevard is a 6-lane east-west major arterial roadway with a posted speed limit of 35 miles per hour near the project site. West of Dixie Highway, the speed limit on Hallandale Beach Boulevard increases to 40 miles per hour. Federal Highway (US 1) is a principal arterial roadway with a posted speed limit of 45 miles per hour, south of Hallandale Beach Boulevard, and 35 miles per hour north of Hallandale Beach Boulevard. US 1 provides three through lanes in each direction, south of Hallandale Beach Boulevard and becomes a four-lane roadway north of Hallandale Beach Boulevard.

Intersections

For purposes of this study, the following nine (9) intersections were selected for detailed analysis purposes.

- US 1 and Atlantic Shores (signalized)
- NE 3rd Street and US 1 (signalized)
- Hallandale Beach Boulevard and US 1 (signalized)
- US 1 and Hibiscus Street (stop control)
- US 1 and SE 3rd Street (signalized)
- Hallandale Beach Boulevard and Dixie Highway/NE 1st Ave (signalized)
- Hallandale Beach Boulevard and NE 8th Avenue (signalized)
- Hallandale Beach Boulevard and NE 10th Avenue (signalized)
- Hallandale Beach Boulevard and NE 14th Avenue (signalized)

Figure 2 depicts the number of lanes on the roadways located within the study area of the proposed project. The turning lanes provided at the intersection selected for detailed analysis purposes are also illustrated in the figure.

Additionally, the project's traffic impacts (with no LOS analysis) will be documented at the following 10 intersections:

- Hallandale Beach Boulevard and NW 10th Terrace (signalized)
- Hallandale Beach Boulevard and NW 8th Avenue (signalized)
- Hallandale Beach Boulevard and NW 6th Avenue (signalized)
- Hallandale Beach Boulevard and NW 4th Avenue (signalized)

- Hallandale Beach Boulevard and Layne Boulevard (signalized)
- Hallandale Beach Boulevard and Golden Isles Drive (signalized)
- Hallandale Beach Boulevard and Diplomat Parkway (signalized)
- Hallandale Beach Boulevard and Three Islands Boulevard (signalized)
- US 1 and Pembroke Road (signalized)
- US 1 and SE 9th Street (signalized)

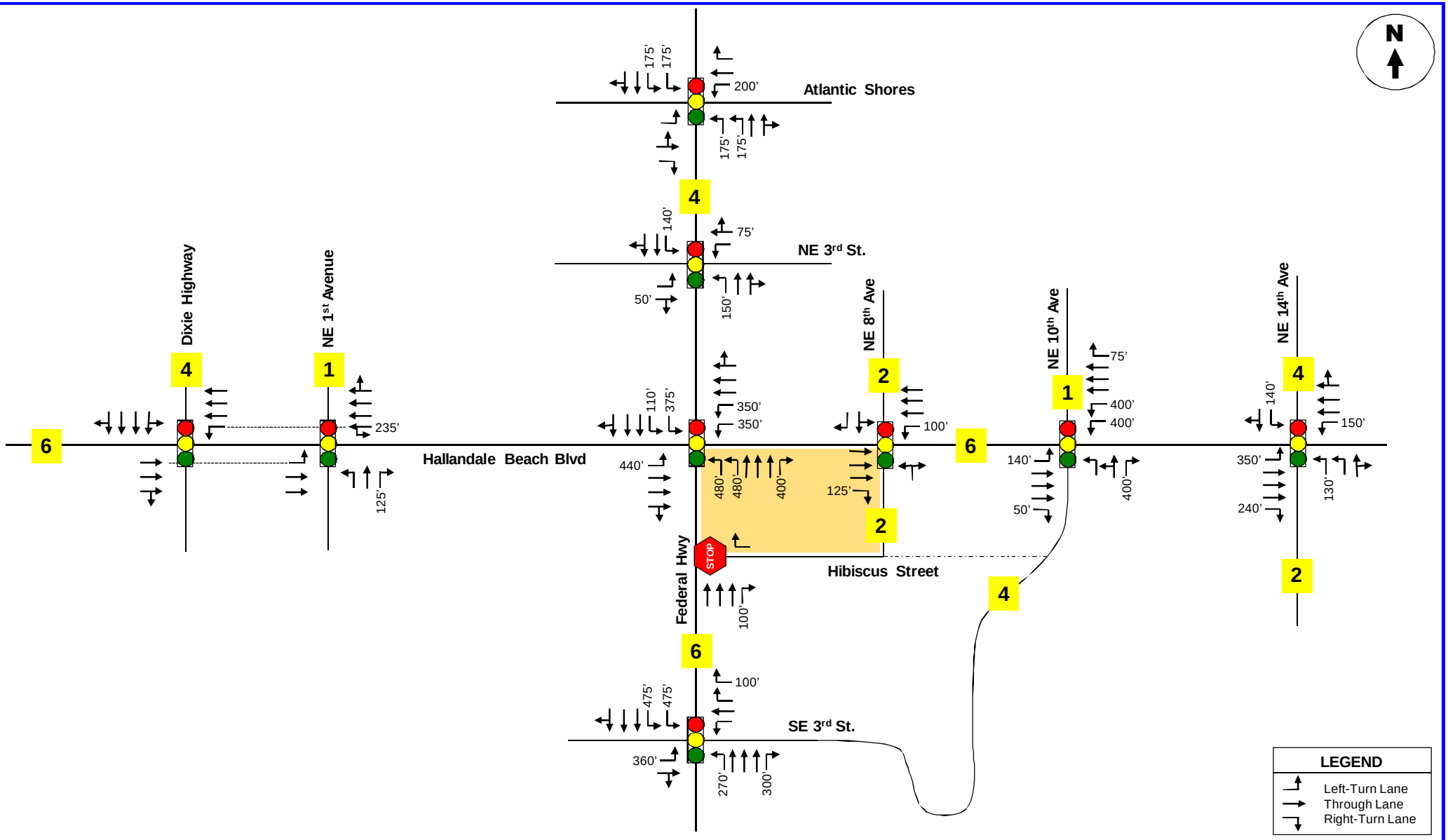
Transit Service and Facilities

Five (5) Broward County Transit Routes serve the project site. These routes include:

- Route 1: North and south along Federal Highway
- Breeze US 1: North and south along Federal Highway
- Route 4: East and west along East Hallandale Beach Boulevard between NE 14th Avenue and SR A1A
- Route 5: North and south along Federal Highway (southern point includes US 1 and SE 3rd Street)
- Route 28: East and west along Hallandale Beach Boulevard

Bus stops are located at the far-side legs of the intersection of East Hallandale Beach Boulevard and Federal Highway. Bus stops are located on the northbound lanes of Federal Highway, north of East Hallandale Beach Boulevard, southbound lanes of Federal Highway, south of East Hallandale Beach Boulevard, eastbound lanes of East Hallandale Beach Boulevard, east of Federal Highway, and the westbound lanes of East Hallandale Beach Boulevard, west of Federal Highway. The bus stop located immediately north of the project site has a bus shelter.

Sidewalks are provided along the north and west sides of the project site. Pedestrian features with crosswalks are provided at the intersections near the project site (Federal Highway/East Hallandale Beach Boulevard and East Hallandale Beach Boulevard and NE 8th Avenue).



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EXISTING LANE GEOMETRY

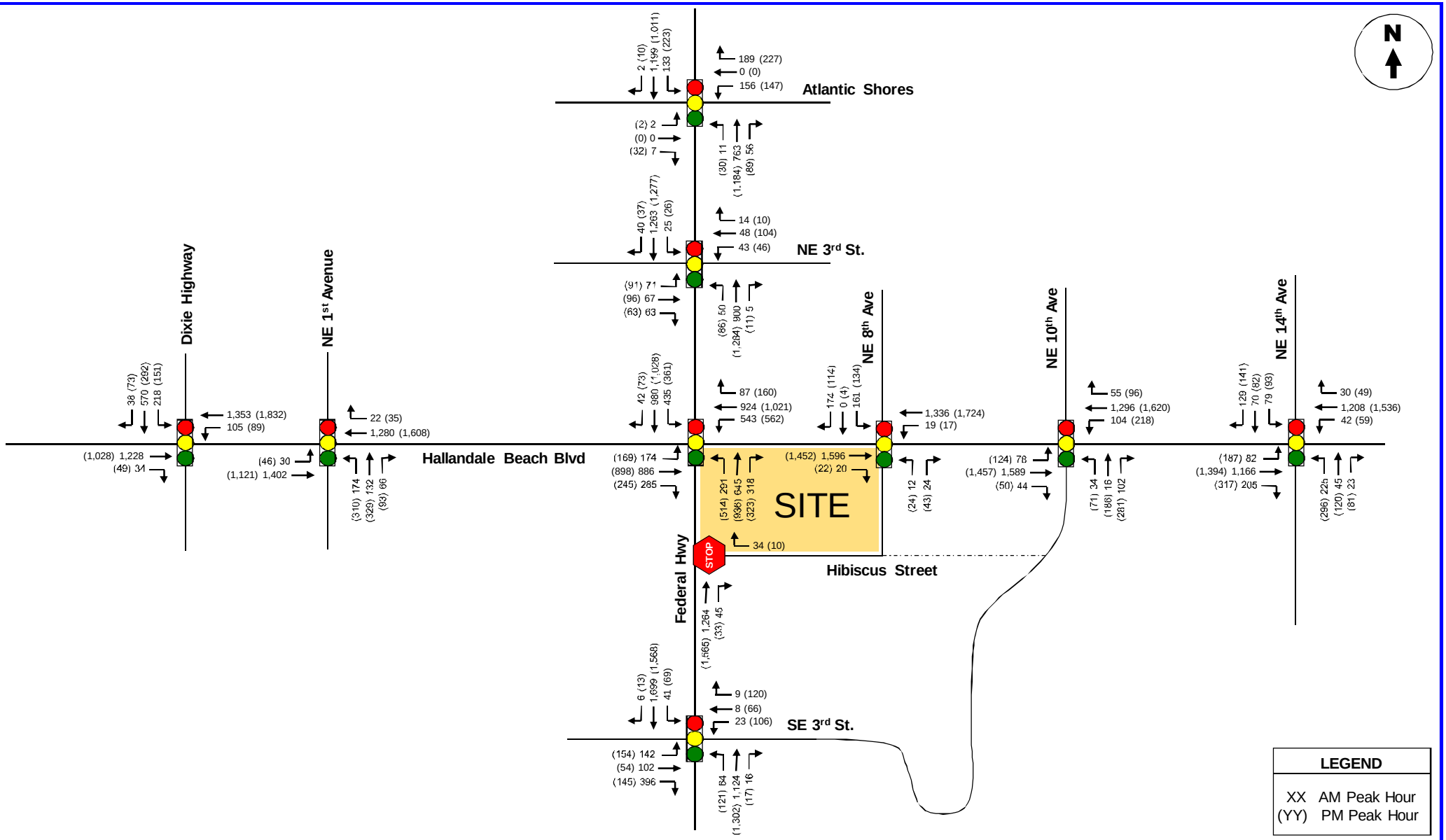
FIGURE 2
Chateau Square
Hallandale Beach, Florida

TRAFFIC COUNTS

Traf Tech Engineering, Inc., in association with Crossroads Engineering Data, Inc. and Traffic Survey Specialists, Inc., collected traffic data at the following nine (9) locations:

- US 1 and Atlantic Shores (signalized)
- NE 3rd Street and US 1 (signalized)
- Hallandale Beach Boulevard and US 1 (signalized)
- US 1 and Hibiscus Street (stop control)
- US 1 and SE 3rd Street (signalized)
- Hallandale Beach Boulevard and Dixie Highway/NE 1st Ave (signalized)
- Hallandale Beach Boulevard and NE 8th Avenue (signalized)
- Hallandale Beach Boulevard and NE 10th Avenue (signalized)
- Hallandale Beach Boulevard and NE 14th Avenue (signalized)

The intersection turning movement counts collected on Wednesday, January 21, 2015 and on Wednesday, April 15, 2015 during the AM peak period (7:00 AM to 9:00 AM) and the PM peak period (4:00 PM to 6:00 PM). The existing AM and PM peak hour traffic counts are presented in Figure 3 on the following page. Appendix D contains the traffic data as collected in the field. The signal timing plans for the signalized intersections were obtained from Broward County and are also contained in Appendix D.



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INTERSECTION TURNING MOVEMENT COUNTS
(January and April, 2015)

FIGURE 3
Chateau Square
Hallandale Beach, Florida

TRIP GENERATION

The trip generation for the proposed re-development project was based on information contained in the Institute of Transportation Engineer's (ITE) *Trip Generation Manual* (9th Edition). According to the subject ITE manual, the most appropriate "land use" categories for the existing and proposed land uses are ITE's Land Use 223 – Mid Rise Residential Condominium/Townhouse, ITE's Land Use 310 – Hotel and ITE land Use 820 – Specialty Retail. The trip generation equations for the proposed land uses, given by ITE, are:

ITE Land Use 232 – High Rise Residential Condominium/Townhouse

Weekday Daily Trip Generation
T = 4.18 (X)
Where T = number of weekday daily trips and
X = number of units

Weekday AM Peak Hour of Adjacent Street
T = 0.34 (X) (19% inbound and 81% outbound)
Where T = number of weekday peak hour trips and
X = number of units

Weekday PM Peak Hour of Adjacent Street
T = 0.38 (X) (62% inbound and 38% outbound)
Where T = number of weekday peak hour trips and
X = number of units

ITE Land Use 310 – Hotel

Weekday Daily Trip Generation
T = 8.17 (X)
Where T = number of weekday daily trips and
X = number of rooms

Weekday AM Peak Hour of Adjacent Street
T = 0.53 (X) (59% inbound and 41% outbound)

Weekday PM Peak Hour of Adjacent Street
T = 0.60 (X) (51% inbound and 49% outbound)
Where T = number of weekday peak hour trips and
X = number of rooms

ITE Land Use 710 – General Office Building

Weekday Daily Trip Generation
Ln(T) = 0.76 Ln(X) + 3.68
Where T = number of daily trips
X = 1,000 square feet of gross floor area

Weekday AM Peak Hour of Adjacent Street
Ln(T) = 0.80 Ln(X) + 1.57 (88% inbound and 12% outbound)
Where T = number of AM peak hour trips
X = 1,000 square feet of gross floor area

Weekday PM Peak Hour of Adjacent Street
T = 1.12 (X) + 78.45 (17% inbound and 83% outbound)
Where T = number of PM peak hour trips
X = 1,000 square feet of gross floor area

ITE Land Use 820 – Shopping Center

Weekday Daily Trip Generation
Ln(T) = 0.65 Ln(X) + 5.83
Where T = number of daily trips
X = 1,000 square feet of gross leasable area

Weekday AM Peak Hour of Adjacent Street
Ln(T) = 0.61 Ln(X) + 2.24 (62% inbound and 38% outbound)
Where T = number of AM peak hour trips
X = 1,000 square feet of gross leasable area

Weekday PM Peak Hour of Adjacent Street
Ln(T) = 0.67 Ln(X) + 3.31 (48% inbound and 52% outbound)
Where T = number of PM peak hour trips
X = 1,000 square feet of gross leasable area

Using the above-listed trip generation rates from the ITE document, a trip generation analysis was undertaken for the existing and proposed developments. The results of this effort are documented in Tables 1 and 2. As indicated in Table 2, the proposed re-development project is anticipated to generate approximately 11,332 daily trips, approximately 795 AM peak hour trips (459 inbound and 336 outbound), and approximately 927 gross PM trips (399 inbound and 528 outbound). The internal capture calculations and the pass-by deductions are accounted for in the tables (the calculation procedures are presented following Tables 1 and 2.

Table 1 and 2 show a comparison of the existing and proposed developments for the site. The trip difference is documented at the bottom of Table 2. This information is provided for information purposes. For purposes of the traffic study, and given the fact that the existing development is not fully occupied/leased, only the existing development trips using the intersections of Hallandale Beach Boulevard/NE 8th Avenue and South Federal Highway/Hibiscus Street were deducted from the total traffic. These existing development trips were counted as part of the intersection turning movement counts. No other deductions of existing development trips were made throughout the study area (conservative approach).

The primary focus of the work/live units is to provide housing for residents that also work at the mixed-use development and therefore, minimize/eliminate traffic impacts from the surrounding street system. However, for purposes of this traffic study, it was assumed that the work/live units would generate trips similar to the high-rise residential units (ITE LUC 232).

TABLE 1 Trip Generation Summary (Existing Use) 600 East Hallandale								
			AM Peak Hour			PM Peak Hour		
Land Use	**Size**	**Daily Trips**	**Total Trips**	**Inbound**	**Outbound**	**Total Trips**	**Inbound**	**Outbound**
Retail (includes Rest)	60,609	4,904	115	71	44	428	206	223
Pass-by (Retail-25%)		-1,226	0	0	0	-107	-51	-56
External Trips		**3,678**	**115**	**71**	**44**	**321**	**155**	**167**

Source: ITE Trip Generation Manual (9th Edition)

TABLE 2 Trip Generation Summary (Proposed Uses) Chateau Square								
			AM Peak Hour			PM Peak Hour		
Land Use	**Size**	**Daily Trips**	**Total Trips**	**Inbound**	**Outbound**	**Total Trips**	**Inbound**	**Outbound**
Retail LUC 820	137,384	8,348	189	117	72	741	356	385
Office LUC 710	152,792	1,812	269	236	32	250	43	208
Hotel LUC 310	280	2,288	148	87	61	168	86	82
High Rise LUC 232	691	2,888	235	45	190	263	163	100
Work/Live LUC 232	36	150	12	2	10	14	9	5
Subtotal		**15,486**	**853**	**488**	**365**	**1,436**	**656**	**781**
Internal (7%/26%)		-2,555	-58	-29	-29	-367	-184	-184
Driveway Volumes		**12,931**	**795**	**459**	**336**	**1,069**	**472**	**597**
Pass-by (Retail-25%)		-1,599	0	0	0	-142	-73	-69
External Trips		**11,332**	**795**	**459**	**336**	**927**	**399**	**528**

Source: ITE Trip Generation Manual (9th Edition)

NOTE: Pass-by reduction is associated with external trips (gross minus internal) for the retail land use (retail external is 569 total trips; 292 ins and 278 out, based on internal capture calculatios for Land Use B)

Difference in Trips		**7,654**	**680**	**388**	**292**	**606**	**244**	**361**

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PROPOSED LAND USES

Trip Generation and Internal Capture Summary

Analyst: Vargas
Date: 18-Oct-15
AM Peak Hour

LAND USE A: Office

ITE LU Code: Code 710
SIZE:

	Total	Internal	External
Enter	236	15	222
Exit	32	9	23
Total	269	24	245
%	100%	9%	91%

Exit to External: 23
Enter from External: 222

28%	9	4%	9
Demand		Demand	
9		9	
Balanced		Balanced	
32%	38	29%	21
Demand		Demand	

1%	0	3%	7
Demand		Demand	
0		5	
Balanced		Balanced	
0%	0	2%	5
Demand		Demand	

LAND USE B: Retail

ITE LU Code: Code 820
SIZE:

	Total	Internal	External
Enter	117	12	106
Exit	72	12	60
Total	189	24	165
%	100%	13%	87%

Exit to External: 60
Enter from External: 106

Demand		Balanced	Demand		
14%	10	3	2%	3	
17%	20	3	1%	3	
Demand		Balanced	Demand		

LAND USE C: Residential/Hotel

ITE LU Code: Codes 232 & 310
SIZE:

	Total	Internal	External
Enter	134	3	132
Exit	261	8	253
Total	395	11	384
%	100%	3%	97%

Enter from External: 132
Exit to External: 253

Net External Trips for Multi-Use Development

	LAND USE A	LAND USE B	LAND USE C	TOTAL
Enter	222	106	132	459
Exit	23	60	253	336
Total	245	165	384	795
Single-Use Trip Gen. Est.	269	189	395	853

INTERNAL CAPTURE: 7%

PROPOSED LAND USES

Trip Generation and Internal Capture Summary

Analyst: Vargas
Date: 18-Oct-15
PM Peak Hour

LAND USE A: Office

ITE LU Code: Code 710
SIZE:

	Total	Internal	External
Enter	43	15	27
Exit	208	33	175
Total	250	48	202
%	100%	19%	81%

Exit to External: 175
Enter from External: 27

LAND USE B: Retail

ITE LU Code: Code 820
SIZE:

	Total	Internal	External
Enter	356	64	292
Exit	385	108	278
Total	741	172	569
%	100%	23%	77%

Exit to External: 278
ter from External: 292

LAND USE C: Residential/Hotel

ITE LU Code: Codes 232 & 310
SIZE:

	Total	Internal	External
Enter	257	104	153
Exit	188	43	144
Total	445	147	298
%	100%	33%	67%

Enter from External: 153
Exit to External: 144

	Demand	Balanced	Demand
A → B	20% 42	28	8% 28
B → A	31% 13	8	2% 8
A → C	2% 4	4	4% 10
C → A	57% 24	8	4% 8
B → C	26% 100	100	46% 118
C → B	10% 36	36	42% 79

Net External Trips for Multi-Use Development

	LAND USE A	LAND USE B	LAND USE C	TOTAL
Enter	27	292	153	472
Exit	175	278	144	597
Total	202	569	298	1,069
Single-Use Trip Gen. Est.	250	741	445	1,436

INTERNAL CAPTURE: 26%

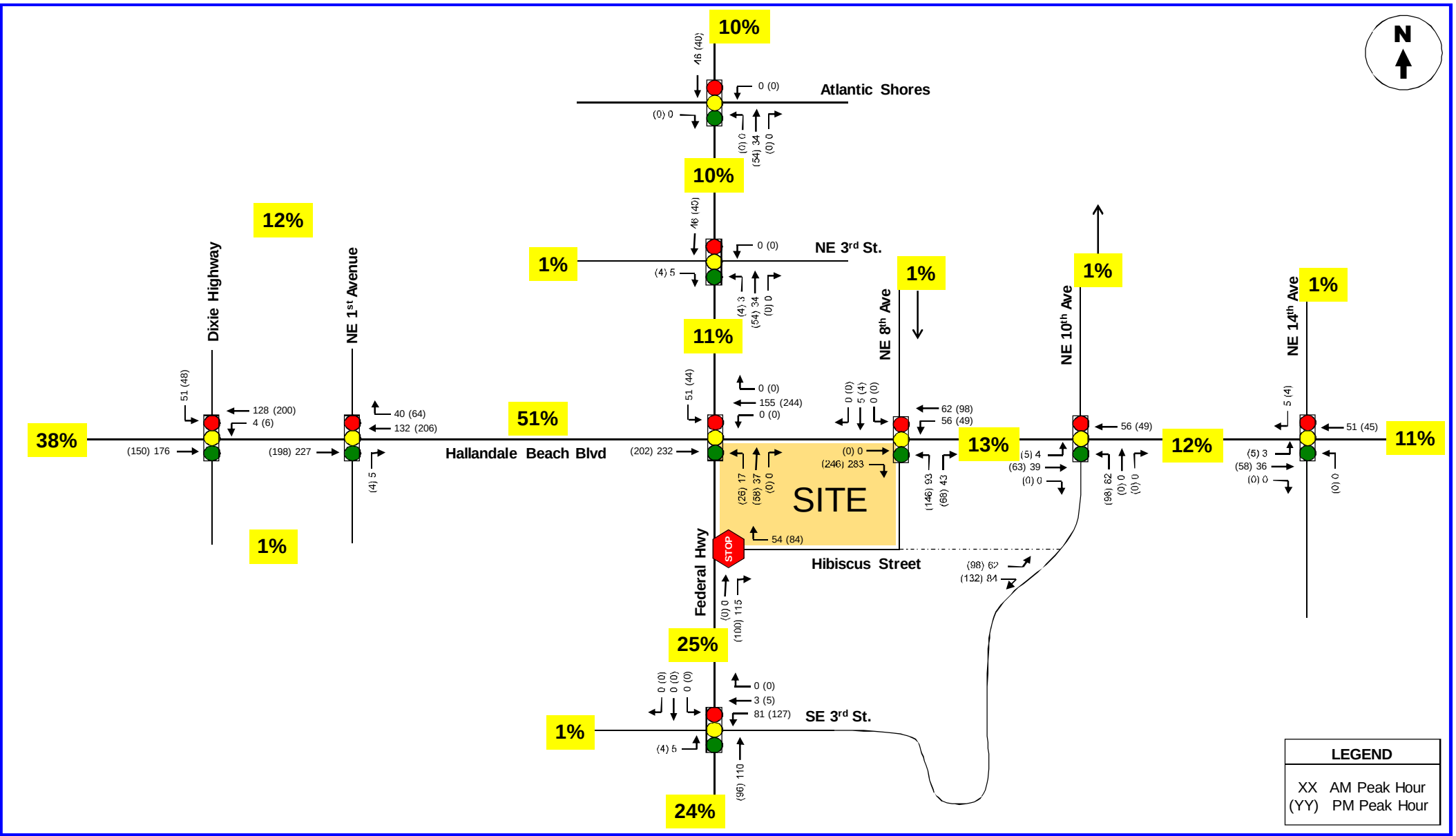
TRIP DISTRIBUTION AND TRAFFIC ASSIGNMENT

The trip distribution and traffic assignment for the project were based on the results of modeling efforts undertaken using the (2035) SERPM model. For this analysis, the proposed land uses for the project were added to the site. A select-zone plot was produced and is included in Appendix E. Based on the results of the SERPM run, the following traffic assignment was used for the proposed re-development project:

- 11% to and from the north via Federal Highway
- 25% to and from the south via Federal Highway
- 13% to and from the east via East Hallandale Beach Boulevard
- 51% to and from the west via Hallandale Beach Boulevard
  - 12% to and from the north via Dixie Highway/NE 1st Avenue
  - 1% to and from the south via Dixie Highway/SE 1st Avenue
  - 38 to and from the west via Hallandale Beach Boulevard, west of Dixie Hwy

The new peak hour traffic generated by the project was assigned to the nearby transportation network using the traffic assignment documented above. Since SERPM is a macro-level model designed to distribute traffic on a regional basis, manual adjustments were made to account for the extension of Hibiscus Street between South Federal Highway and NE 10th Avenue. The project traffic assignment is summarized in Figure 4a through 4d without valet. These figures do not assume valet drop-off and pick-up routes (this will be addressed in the subsequent section).

The trip assignments shown on Figures 4a, 4b and 4c are based on the external trips from the proposed land uses shown on Table 2. Turning movement counts from the existing site driveway intersections (i.e. US 1/Hibiscus Street and Hallandale Beach Boulevard/NE 8th Avenue) were removed in the total volume calculation. However, trips from the existing land uses along US 1 and Hallandale Beach Boulevard were not removed. This decision was made in order to assess impacts with a conservative approach.



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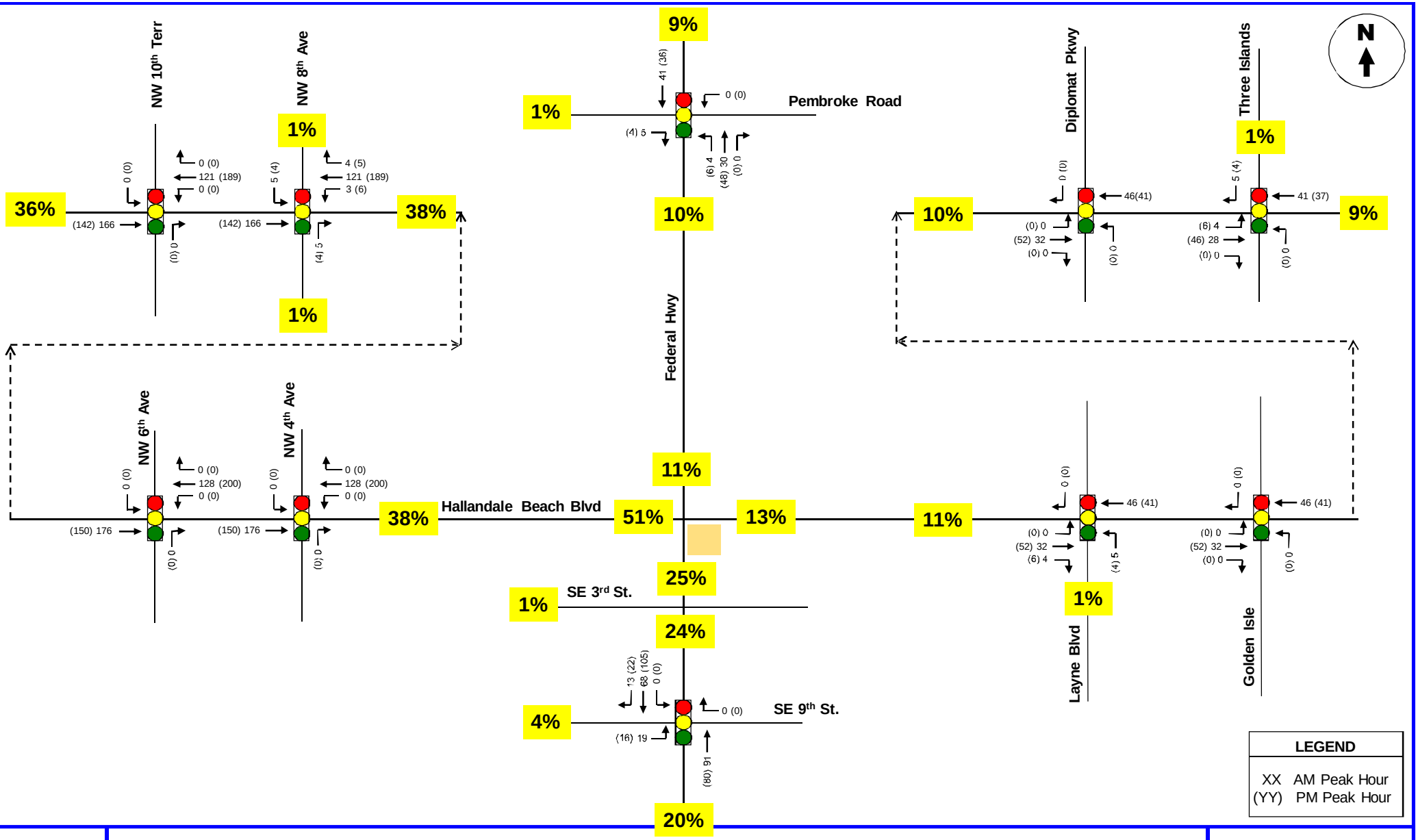
PROJECT TRAFFIC ASSIGNMENT – External Trips

FIGURE 4a
Chateau Square
Hallandale Beach, Florida



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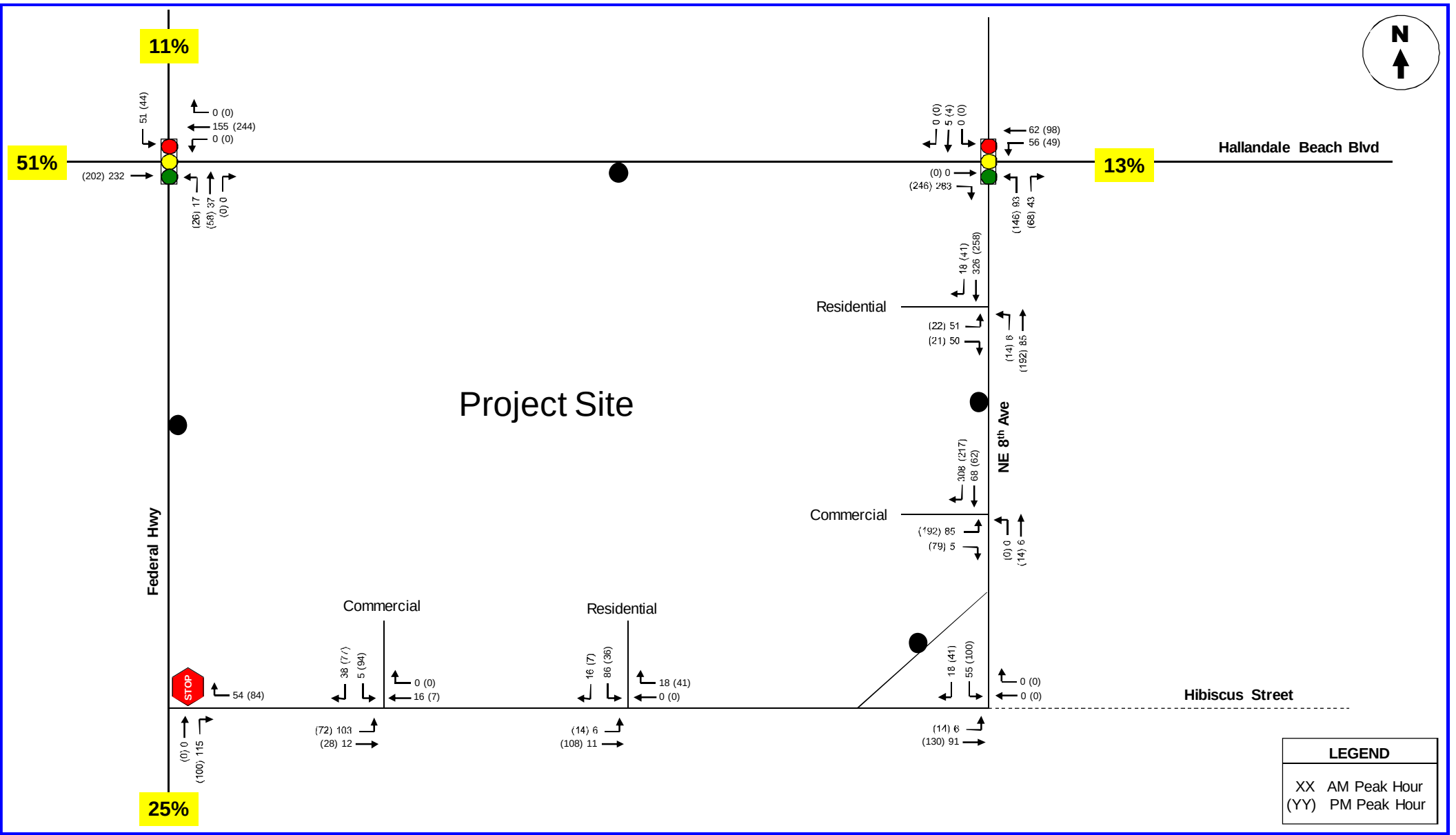
PROJECT TRAFFIC ASSIGNMENT – External Trips

FIGURE 4b
Chateau Square
Hallandale Beach, Florida



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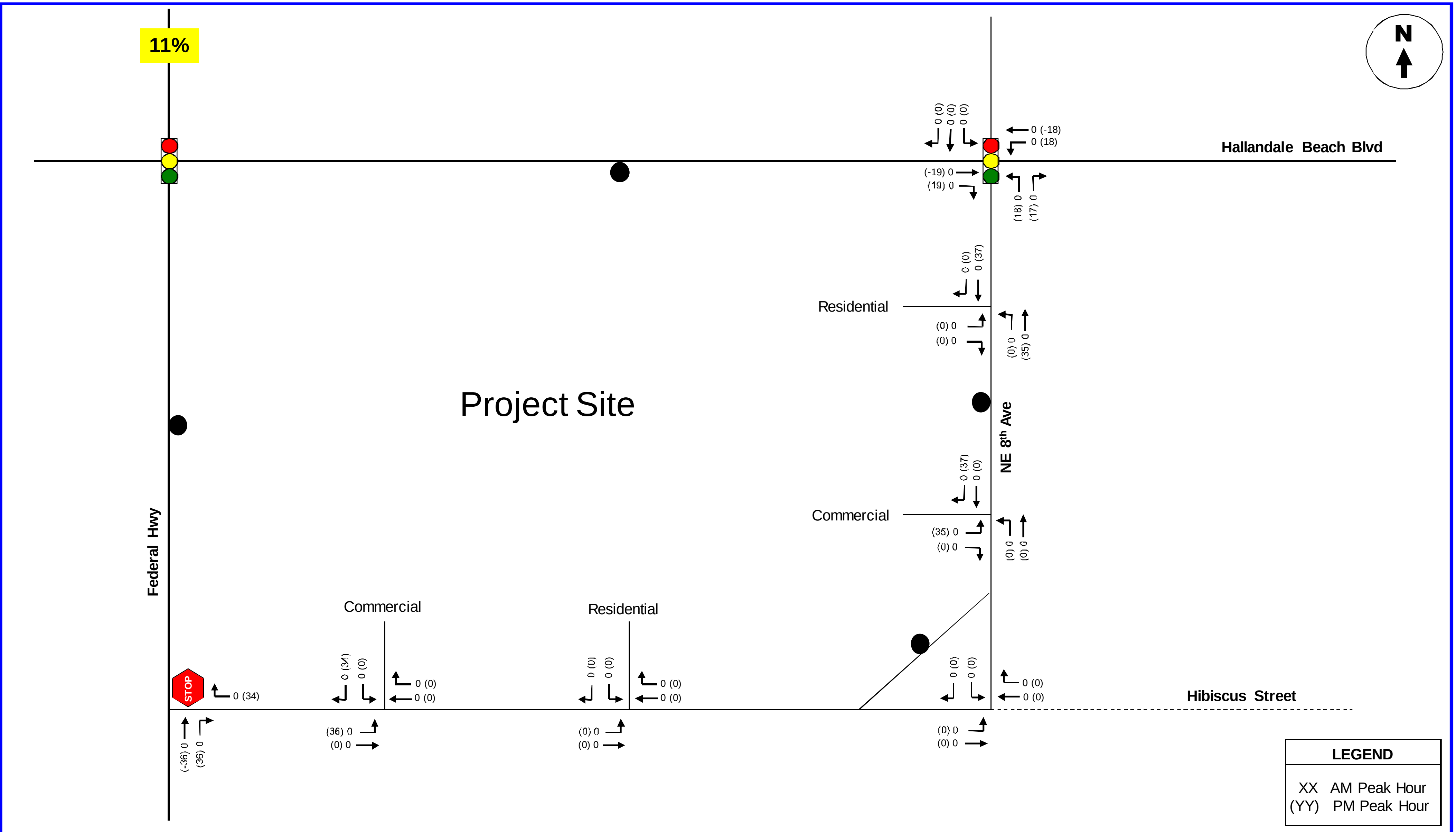
PROJECT TRAFFIC ASSIGNMENT – External Trips

FIGURE 4c
Chateau Square
Hallandale Beach, Florida



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PROJECT TRAFFIC ASSIGNMENT – Passer By Trips

FIGURE 4d
Chateau Square
Hallandale Beach, Florida

VALET USE PROJECTIONS

As described before, the Chateau Square project will include four valet stations, one on Federal Highway, one on East Hallandale Beach Boulevard, one on NE 8th Avenue and one on Hibiscus Street. Each valet station will be designated as follows:

- Federal Highway: Will serve the retail use
- E. Hallandale Beach Blvd: Will serve the office use and the retail use
- NE 8th Avenue: Will serve the retail use
- Hibiscus Street: Will serve the hotel use

Table 3 on the following page documents the anticipated valet use for each of the valet stations (valet will not be mandatory for this project). Figures 5a through 5d document the re-routed traffic as a result of the valet station based on the valet-use projections documented in Table 3.

TABLE 3
Valet Use Projections
Chateau Square

Land Use	Size	Total Driveway AM Peak Hour Trips In	Out	Total	Projected Valet Use AM Peak Hour Trips % (1)	In	Out	Total	Total Driveway PM Peak Hour Trips In	Out	Total	Projected Valet Use PM Peak Hour Trips % (1)	In	Out	Total
Retail	137,384	106	60	166	20%	21	12	33	292	278	570	20%	58	56	114
Office	152,792	222	23	245	7%	16	2	18	27	175	202	7%	2	12	14
Hotel	280	86	59	145	24%	21	14	35	51	63	114	24%	12	15	27
Residential (S Tower)	345	22	92	114	38%	8	35	43	49	38	87	38%	19	14	33
Residential (N Tower)	346	22	92	114	38%	8	35	43	49	38	87	38%	19	14	33
Work/Live	36	2	10	12	0%	0	0	0	5	4	9	0%	0	0	0
Totals (2)		**460**	**336**	**796**		**58**	**28**	**86**	**473**	**596**	**1069**		**72**	**83**	**155**

SOURCE: ITE Trip Generation Manual and Traf Tech Engineering, Inc.

(1) The valet percentages presented above were provided by Park One based on their extensive experience in other similar properties. Park One is a fully diversified professional parking company. The firm provides a wide-range of services that include Parking Logistics Consulting, Valet Parking , Parking Management & Leasing and Special Events. They provide services to more than 150 properties and businesses in retail centers, offices, hotels, municipalities, etc. (refer to Appendix K).

(2) The residents will valet inside the parking garage and not on the valet stations located on the outside street system (no impacts to the outside street system - trips not included in the totals above).

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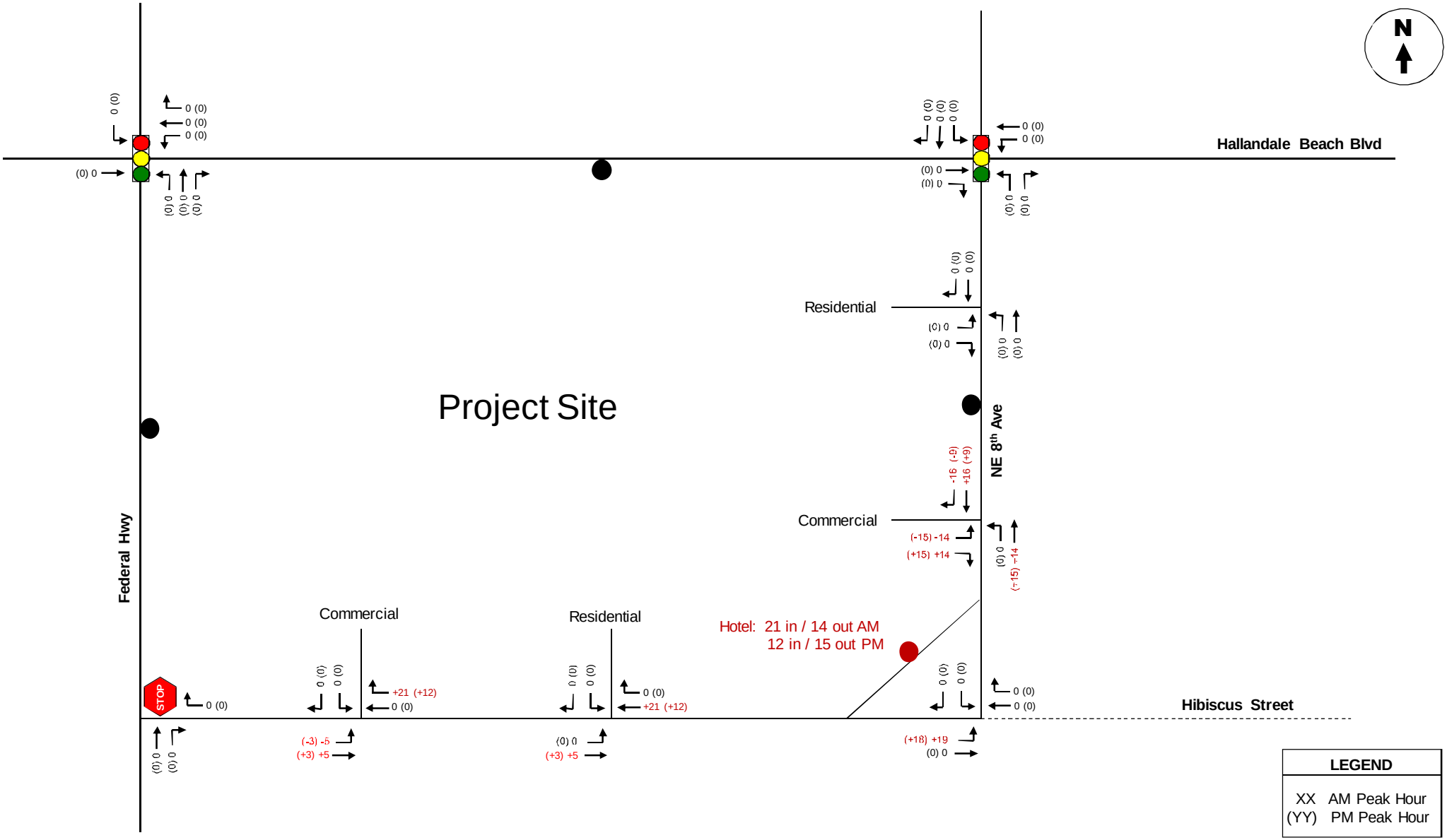

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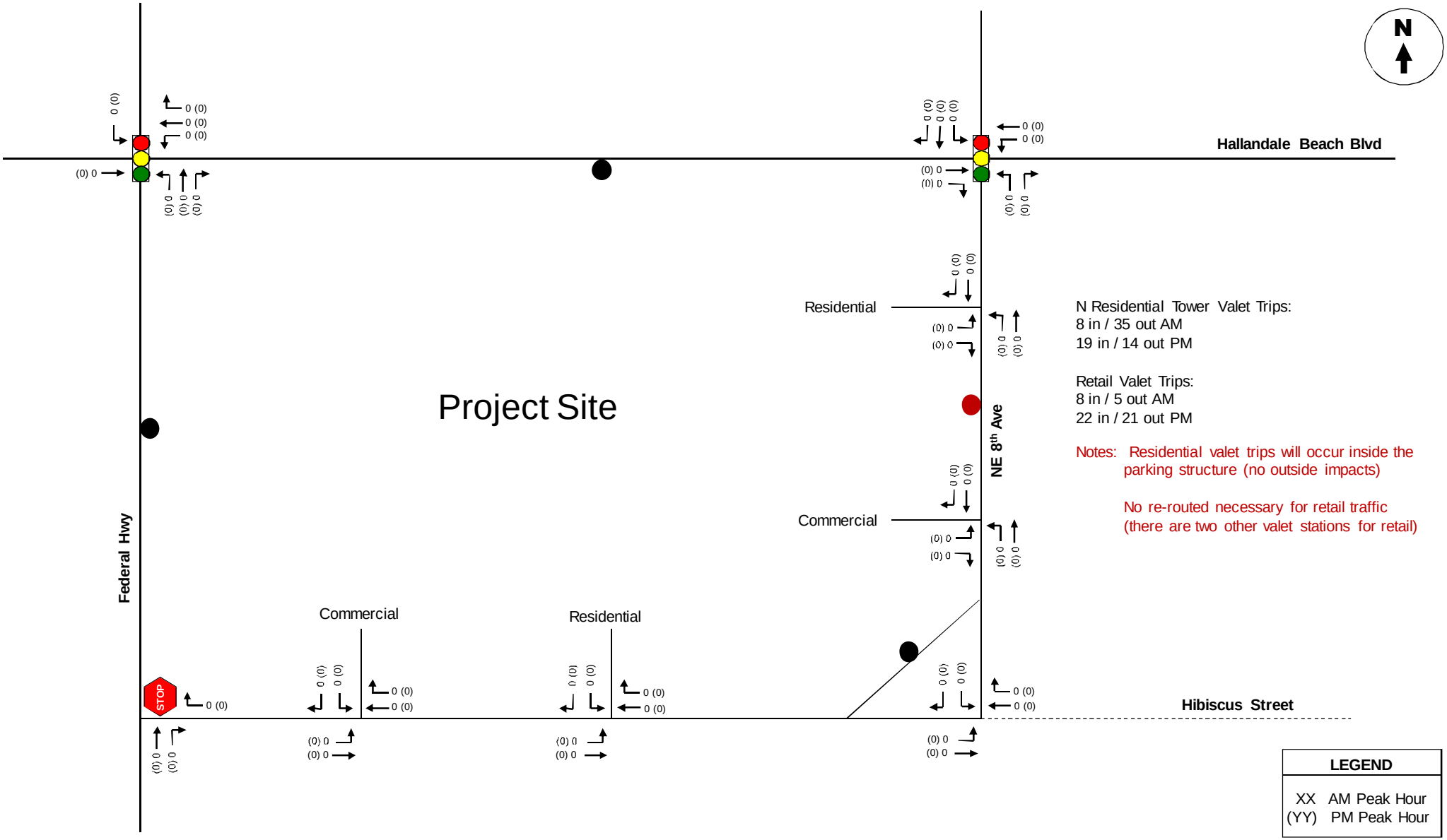
PROJECT TRAFFIC ASSIGNMENT – Valet Trips Hotel

FIGURE 5a
Chateau Square
Hallandale Beach, Florida



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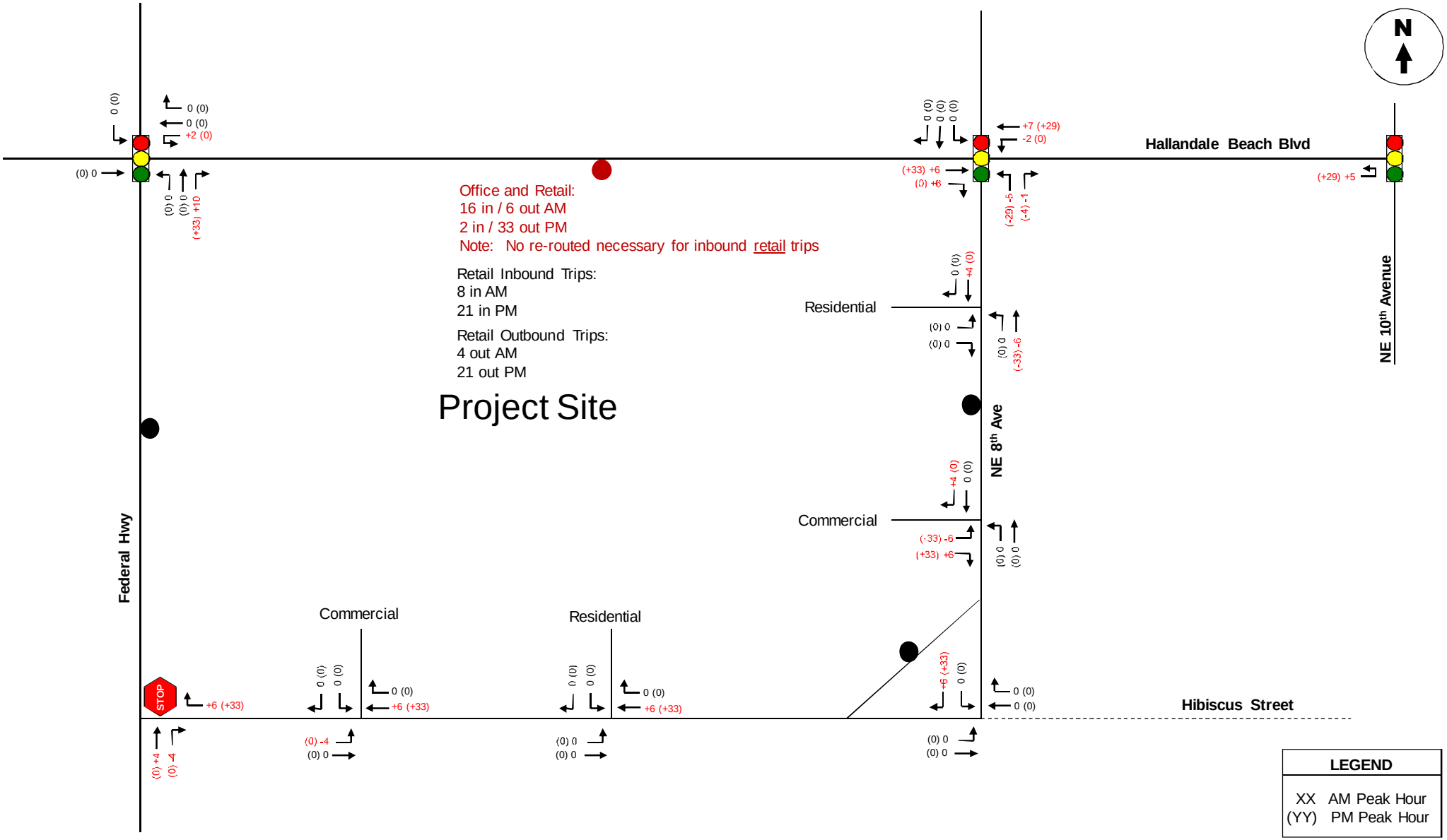
PROJECT TRAFFIC ASSIGNMENT – Valet Trips N. Tower & Retail

FIGURE 5b
Chateau Square
Hallandale Beach, Florida



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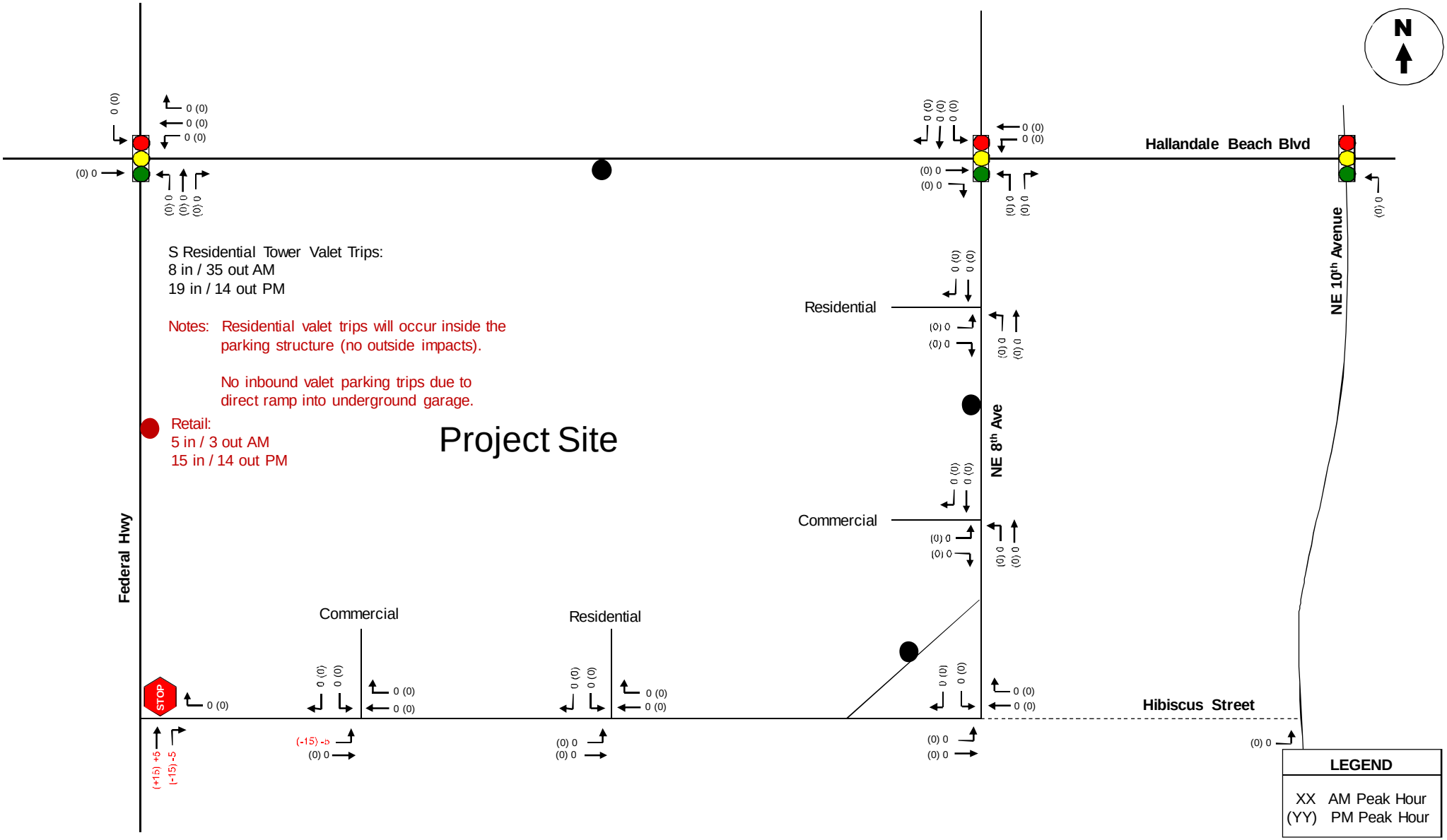
PROJECT TRAFFIC ASSIGNMENT – Valet Trips Office & Retail

FIGURE 5c
Chateau Square
Hallandale Beach, Florida



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PROJECT TRAFFIC ASSIGNMENT – Valet Trips S. Tower & Retail

FIGURE 5d
Chateau Square
Hallandale Beach, Florida

TRAFFIC ANALYSIS

This section of the study is divided into four parts. The first part consists of developing the future conditions traffic volumes for the study area. The second part includes level-of-service analyses for existing and future conditions. The third section focuses on the project impacts (no LOS analyses) for intersections located outside of the project major influence area. The final section calculates the required number of valet personnel required during the project's peak periods.

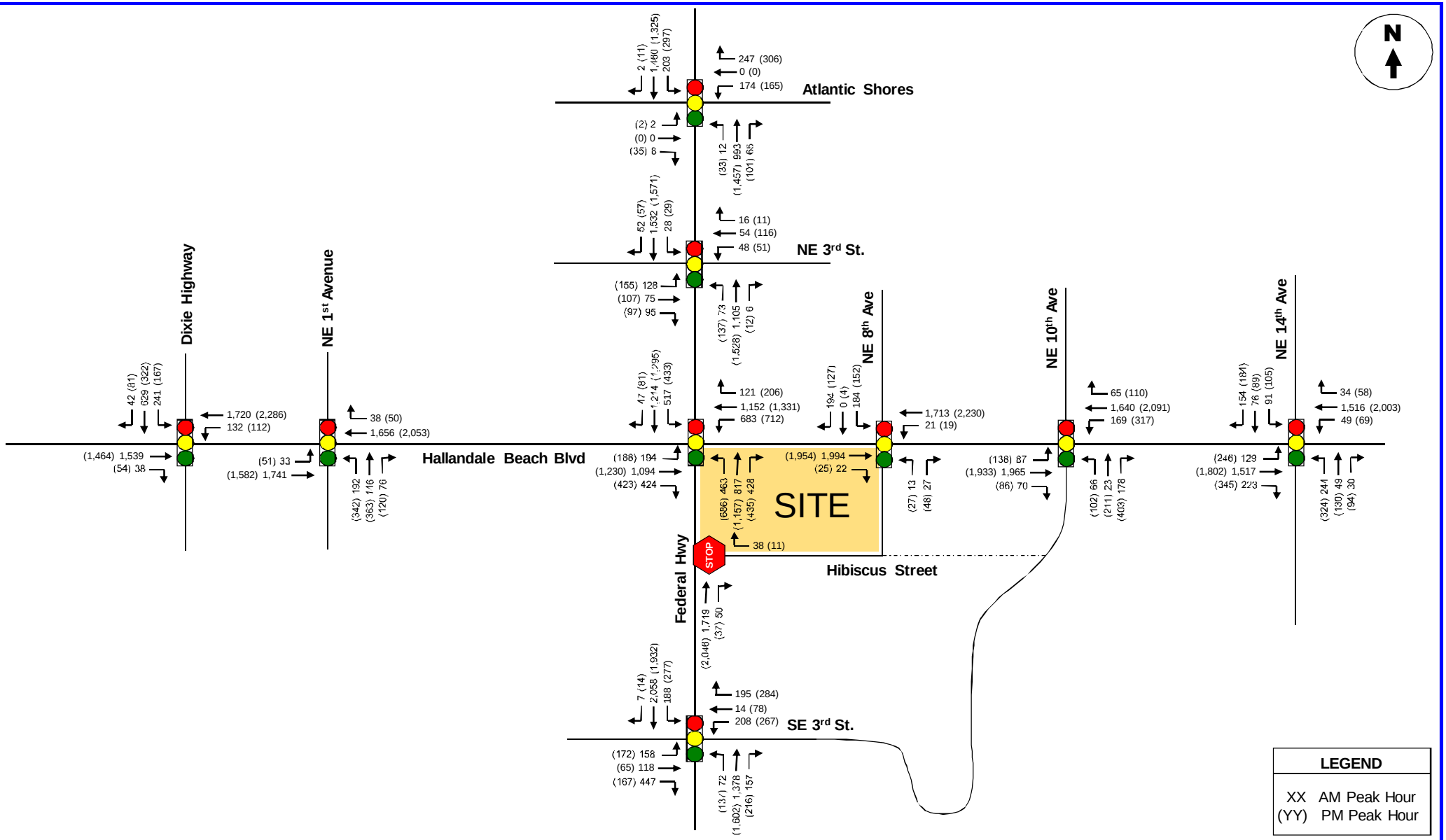
Future Conditions Traffic Volumes

Two sets of future traffic volumes were developed. The first set includes project buildout conditions (assumed to be 2022) without the proposed project and the second set adds the project anticipated to be generated by the proposed Chateau Square development.

In order to develop future-year traffic volumes, without the proposed project, two separate analyses were undertaken. The first analysis converts the existing AM and PM peak hour traffic counts collected in the field during the month of January and April to average peak season conditions. Based on FDOT's Peak Season Factor Category report, an adjustment factor of 1.03/1.04 is required to convert traffic counts collected in the third week of January/April to average peak season conditions (refer to Appendix F). The second analysis includes a growth factor to project existing peak season traffic volumes to future conditions (year 2022). For purposes of this traffic study, a 1.0% growth rate was applied to the 2015 traffic counts in order to develop 2022 background traffic conditions. The 1.0% growth rate was based on a review of four nearby FDOT historical traffic count stations. It is important to note that the FDOT historical traffic count stations have reflected growth rates of less than 1.0% and therefore, the growth analyses used for purposes of this study is considered conservative and account for pending projects. Moreover, committed development trips associated with the Beachwalk, 7th Avenue Village, CVS Pharmacy, Gulfstream Park, Gulfstream Point, Hallandale ArtSquare and Hallandale Oasis (refer to Appendix G) were added to the peak season volumes in order to develop 2022 background traffic conditions for the study area. The Diplomat Golf Course and Tennis development was also included even though it is not an approved project yet. Other minor (De-minimus) developments not included are accounted for in the growth rate.

The future traffic calculations (peak season adjustments, traffic growth, committed development and the traffic associated with the proposed Chateau Square mixed-use project) for the study intersections and the project driveways are contained in Appendix H in tabular format. Two sets of future traffic volumes were developed; one without valet and the other assuming the four valet stations described previously.

Figures 6, 7a, 7b and 7c present the future traffic volumes for the study area. Figure 6 includes background traffic only (without the proposed project) and Figures 7a and 7b include the additional traffic anticipated to be generated by the Chateau Square mixed-use project without valet. Figure 7c includes the traffic assignment with valet operation.



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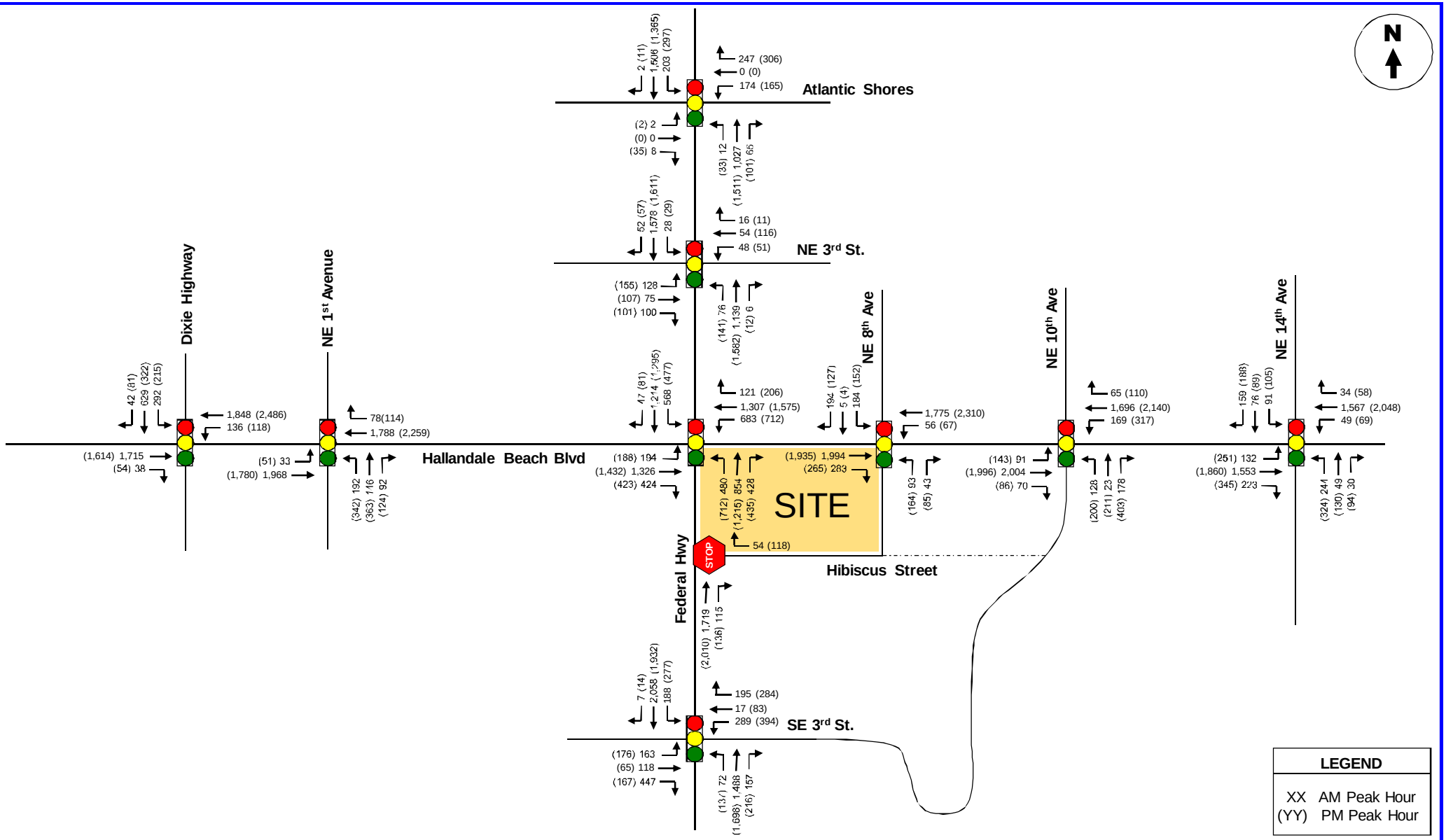
BACKGROUND TRAFFIC CONDITIONS – Year 2022

FIGURE 6
Chateau Square
Hallandale Beach, Florida



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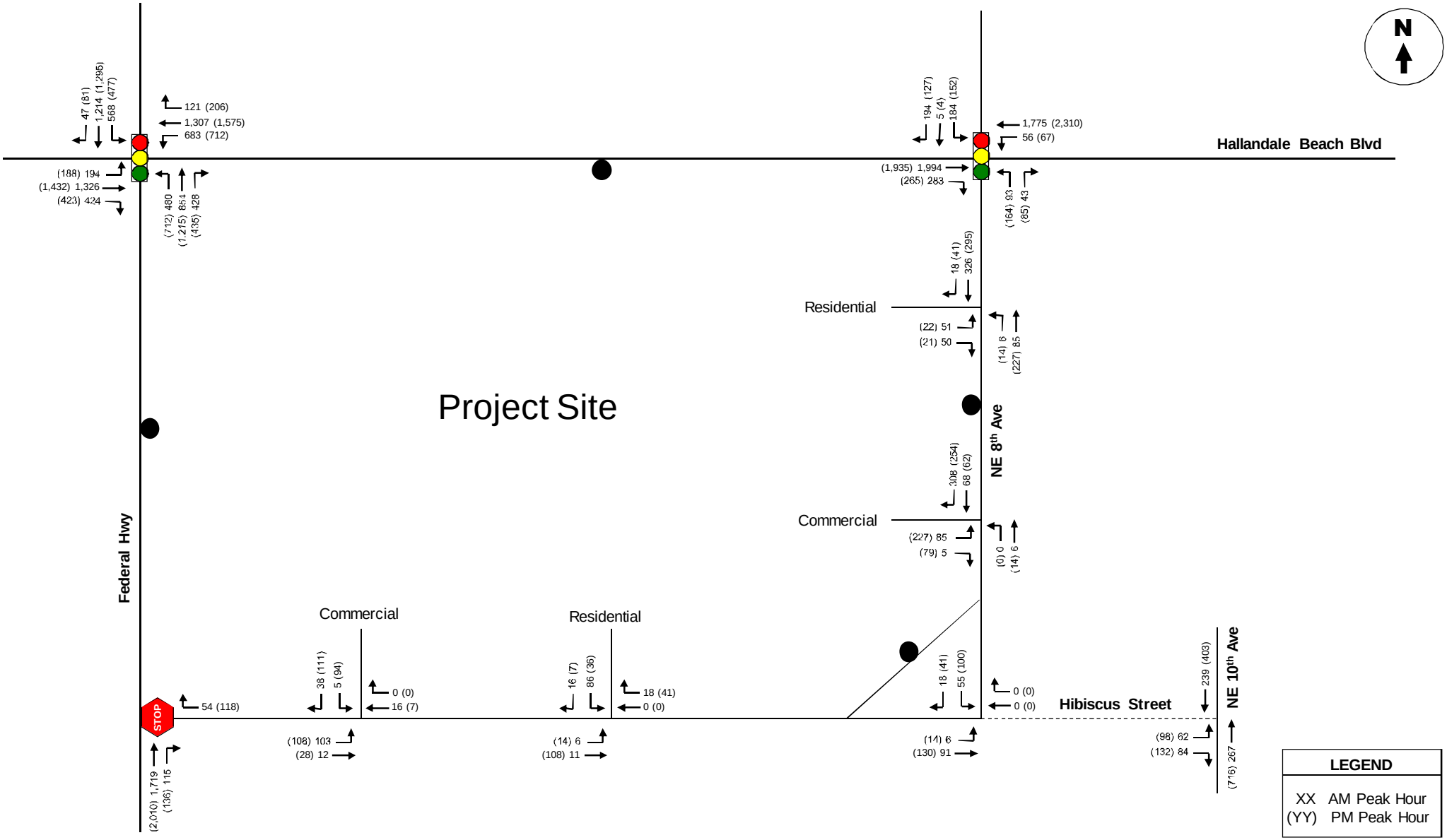
TOTAL TRAFFIC CONDITIONS with PROJECT and NO VALET – Year 2022

FIGURE 7a
Chateau Square
Hallandale Beach, Florida



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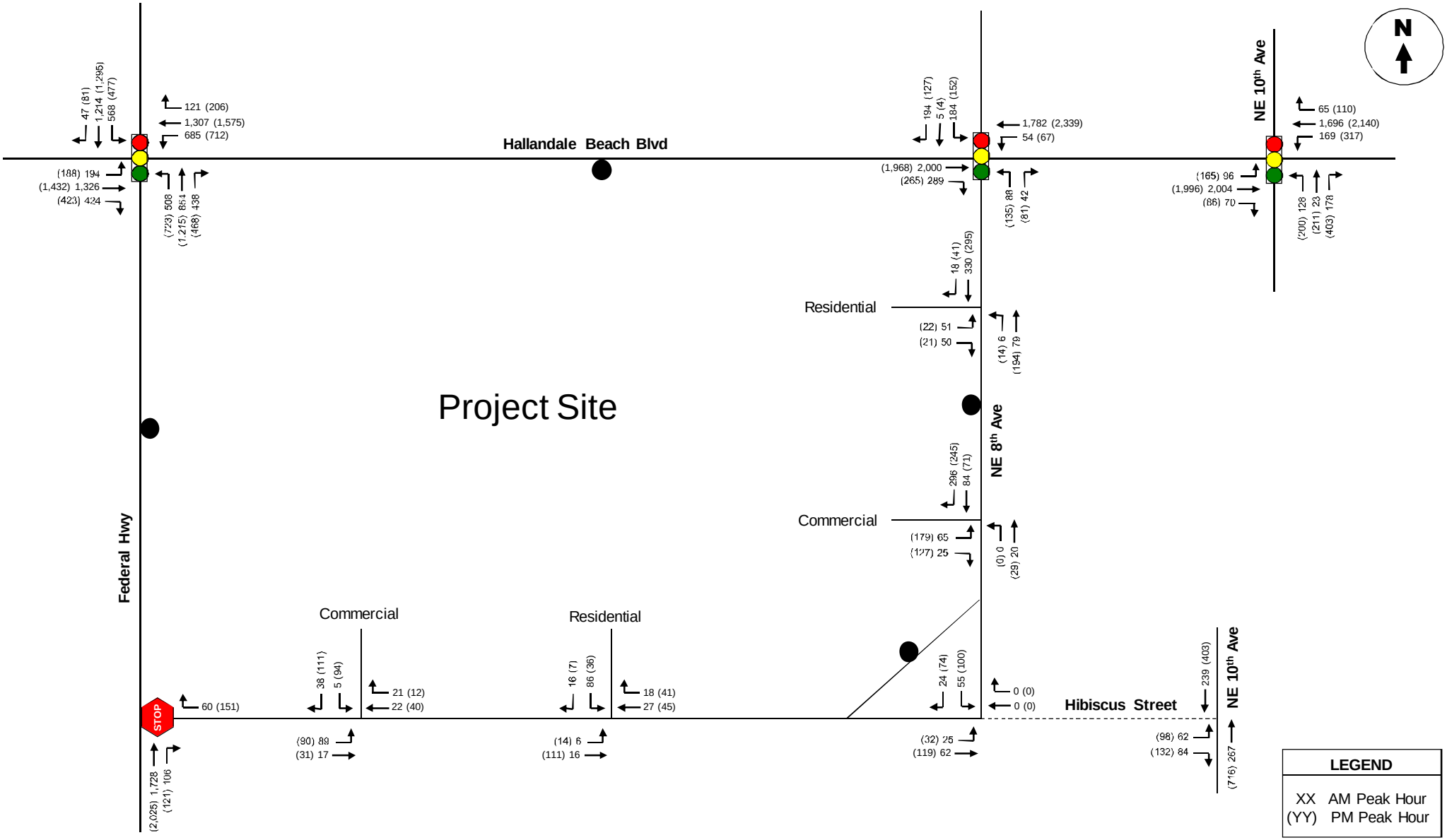
TOTAL TRAFFIC CONDITIONS with PROJECT and NO VALET – Year 2022

FIGURE 7b
Chateau Square
Hallandale Beach, Florida



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TOTAL TRAFFIC CONDITIONS with PROJECT and VALET SERVICE – Year 2022

FIGURE 7c
Chateau Square
Hallandale Beach, Florida

Detailed Intersections and Driveways Level of Service Analyses (without Valet)

Intersection capacity analyses were performed for the nine study intersections. The analyses were undertaken following the capacity/level of service procedures outlined in the Highway Capacity Manual 2010 using the SYNCHRO 8 Software. The results of the intersection analyses are summarized in Table 4. Appendix I contains the computer printouts of the intersection capacity analyses.

The results of the driveway analyses (without valet service) are presented below:

- *North Residential Driveway*: Level of service "B" during both the AM and peak hours.

- *South Commercial Driveway*: Level of service "B" during both the AM and PM peak hours.

- *Hibiscus Residential Driveway*: Level of service "A" during both the AM and PM peak hours.

- *Hibiscus Commercial Driveway*: Level of service "A during the AM peak hour and level of service "B" during the afternoon peak period.

Detailed Intersections and Driveways Level of Service Analyses (with Valet)

With valet service, there is no change in level of service at the four access driveways. Moreover, no significant change in level of service occurs at the affected intersections. The only change in level of service includes the westbound approach at the Hibiscus Street/Federal Highway intersection (changes from LOS "C" to "D" in the AM peak hour and the westbound approach at the East Hallandale Beach Boulevard/NE 10th Avenue intersection (changes from LOS "C to "D" in the Am peak hour). These changes in level of service are also documented in Table 4.

TABLE 4 Intersections Level of Service (With and Without Valet Service) Chateau Square			
		Future Traffic Conditions	
Intersection/Approaches	**2015 Existing**	**Year 2022 Without Project**	**Year 2022 With Project[2]**
Hallandale Bch & Dixie Hwy	C (C)	C (C)	D (C)
- *SB Approach*	E (D)	F (E)	F (E)
- *EB Approach*	C (D)	C (C)	C (D)
- *WB Approach*	B (B)	B (B)	B (C)
Hallandale Bch & NE 1st Avenue	C (D)	C (D)	C (E)
- *NB Approach*	D (D)	F (F)	E (F)
- *EB Approach*	B (C)	A (B)	A (B)
- *WB Approach*	D (D)	C (D)	C (E)
Hallandale Bch & US 1	E (E)	F (F)	F (F)
- *NB Approach*	E (E)	F (F)	F (F)
- *SB Approach*	E (E)	F (F)	F (F)
- *EB Approach*	F (E)	F (F)	F (F)
- *WB Approach*	F (F)	F (F)	F (F)
Hallandale Bch & NE 8th Ave	B (B)	B (B)	B (B)
- *NB Approach*	F (F)	F (F)	F (F)
- *SB Approach*	E (E)	E (E)	E (E)
- *EB Approach*	A (A)	A (A)	A (A)
- *WB Approach*	A (A)	B (B)	B (B)
Hallandale Bch & NE 10th Ave	C (D)	D (D)	D (D)
- *NB Approach*	D (E)	D (F)	D (F)
- *EB Approach*	C (D)	D (D)	D (D)
- *WB Approach*	C (D)	C (D)	D C (D)
Hallandale Bch & NE 14th Ave	D (E)	E (F)	E (F)
- *NB Approach*	E (E)	E (E)	E (E)
- *SB Approach*	D (E)	E (E)	E (E)
- *EB Approach*	D (E)	D (F)	D (F)
- *WB Approach*	D (E)	E (F)	E (F)
Federal Hwy & Atlantic Shores	C (D)	C (D)	C (E)
- *NB Approach*	B (C)	C (E)	C (E)
- *SB Approach*	C (C)	C (D)	C (D)
- *EB Approach*	E (E)	E (E)	E (E)
- *WB Approach*	E (E)	E (E)	E (E)
Federal Hwy & NE 3rd Street	B (B)	B (C)	B (C)
- *NB Approach*	A (A)	A (B)	A (C)
- *SB Approach*	A (A)	B (B)	B (B)
- *EB Approach*	E (E)	E (F)	E (F)
- *WB Approach*	E (E)	E (E)	E (E)
Federal Hwy & SE 3rd Street	E (D)	F (E)	F (F)
- *NB Approach*	C (C)	D (D)	E (F)
- *SB Approach*	D (C)	F (F)	F (F)
- *EB Approach*	F (E)	F (E)	F (E)
- *WB Approach*	E (E)	E (E)	E (E)
US 1 & Hibiscus St (WB Right-Turn)	C (C)	C (D)	D C (F)
Hibiscus & SE 10th Ave (EB Approach)	-	-	B (B)

Source: HCM 2010. LEGEND: AM Peak Hour (PM Peak Hour); Red indicates with Valet Service

[2] With and without valet service.

Traffic Impacts outside Project's Major Influence Area

The traffic impacts (volumes and volume/to capacity percentages) at intersections located outside the project's major influence area are summarized in Table 5 below. As indicated in Table 5, the project traffic impacts, in comparison with the roadway's capacity, is considered minimal to moderate.

TABLE 5
Traffic Impacts outside Project's Major Influence Area
Chateau Square

	AM Peak Hour		PM Peak Hour	
Intersection	**Project Trips**	**% of Capacity**	**Project Trips**	**% of Capacity**
Hallandale Bch				
NE 10th Terr	287	5.3%	331	6.1%
NE 8th Ave	304	5.6%	350	6.5%
NE 6th Ave	304	5.6%	350	6.5%
NE 4th Ave	304	5.6%	350	6.5%
Layne Blvd	87	1.9%	103	2.3%
Golden Isles	78	1.7%	93	2.1%
Diplomat Pk.	78	1.7%	93	2.1%
Three Islands	78	1.7%	93	2.1%
Federal Hwy				
Pembroke Rd	80	2.7%	94	3.2%
SE 9th St	191	3.5%	223	4.1%

NOTE: Volumes taken from Figure 4b. Level of service "D" capacities published by Broward County based on FDOT's 2013 Quality and Level of Service Handbook (5,390 and 4,500 vehicles per hour for Hallandale Beach Boulevard, west and east of Dixie Highway and 5,390 vehicles per hour for US 1, south of Hallandale Beach Boulevard and 2,920 vehicles per hour on US 1 north of Hallandale Beach Boulevard.

Valet Evaluation

For each of the four valet stations, the following vehicular demand and conservative assumptions were used in order to determine the number of valet runners required at each valet location in order to prevent valet vehicles from spilling onto the adjacent through street:

- *Federal Highway Valet Station*: Stacking for at least eight (8) vehicles and a parking/unparking time of up to seven (7) minutes per valet vehicle. Based on information presented in Figure 5d, the maximum vehicular demand at this location is approximately 29 vehicles in a one-hour period. This valet station has an direct inbound-only ramp into the underground parking structure for quicker valet service and no impacts to the outside street system.

- *East Hallandale Beach Boulevard Valet Station*: Stacking for at least five (5) vehicles and a parking/un-parking time of up to seven (7) minutes per valet vehicle. Based on information presented in Figure 5c, the maximum vehicular demand at this location is approximately 56 vehicles in a one-hour period.

- *NE 8th Avenue North Valet Station*: Stacking for at least five (5) vehicles and a parking/unparking time of up to five (5) minutes per valet vehicle. Based on information presented in Figure 5b, the maximum vehicular demand at this location is approximately 43 vehicles in a one-hour period.

- *NE 8th Avenue South/Hotel Valet Station*: Stacking for at least three (3) vehicles and a parking/unparking time of up to five (5) minutes per valet vehicle. Based on information presented in Figure 5a, the maximum vehicular demand at this location is approximately 35 vehicles in a one-hour period.

In order to determine the number of valet runners, a queuing analysis was conducted in order to ensure that the on-site/off-street stacking is sufficient to accommodate the maximum vehicular demand anticipated at each valet station. The length of queue anticipated at the drop-off/pick-up area was determined using information contained in ITE's *Transportation and Land Development*, First Edition, Chapter 8 – Drive-In Facilities[3]. For this analysis, the following input variables were used:

- Service Rate: The service rate assumption is presented in Appendix J.

- Demand Rate: The demand rates presented above were used for the estimation of the required number of valet runners.

Using equation 8-9b and Table 8-11 of ITE's *Transportation and Land Development (First Edition – Chapter 8)*, the maximum number of valet runners required at the Federal Hwy and E. Hallandale Beach Blvd. stations include six (6) and 11, respectively. At the NE 8th Avenue north valet stations is six (6) and at the hotel valet stand five (5). The results of the ITE queuing procedure is contained in Appendix J. Additional information relative to the parking/un-parking time is contained in the appendix.

Link Analyses

Link analyses were undertaken within the study using the Generalized Service Volume Tables in the FDOT 2013 Quality and LOS Handbook. The roadway segment evaluation is presented in Tables 6 and 7. There is no change in the results of the roadway segment analyses with the valet service (no change in LOS), as presented in the Tables 6 and 7.

[3] By Vergil G. Stover and Frank J. Koepke.

TABLE 6 Link Evaluation - Chateau Square AM Peak Hour Analysis								
			Existing Traffic (2015)		Future Conditons (2022) w/o Project		Future Conditions (2022) with Project	
Roadway Segment	**Lanes**	**LOS "D" Capacity**	**Volume**	**LOS**	**Volume**	**LOS**	**Volume**	**LOS**
Hallandale Bch Blvd								
- West of Dixie/NE 1st Ave	6	5390	2653	C	3339	C	3643	C
- Dixie/NE 1st Ave to US 1	6	4500	2770	D	3522	D	3926	D
- US 1 to NE 8th Avenue	6	4500	3193	D	3995	D	4433	D
- US 1 to NE 8th Avenue w/valet	6	4500	3193	D	3995	D	4447	D
- NE 8th Avenue to NE 10th Ave	6	4500	3136	D	3938	D	4051	D
- NE 8th Ave to NE 10th Ave w/valet	6	4500	3136	D	3938	D	4061	D
- NE 10th Avenue to NE 14th Ave	6	4500	3146	D	4017	D	4112	D
- NE 14th Ave to East	6	4500	2548	D	3237	D	3324	D
Federal Highway								
- Pembroke Rd to Atlantic Shores	4	2920	2288	D	2907	D	2987	F
- Atlantic Shores to NE 3rd Street	4	2920	2313	D	2860	D	2940	F
- NE 3rd Street to US 1	4	2920	2324	D	2858	D	2946	F
- US 1 to Hibiscus Street	6	5390	3082	C	4051	C	4067	C
- US 1 to Hibiscus Street w/valet	6	5390	3082	C	4051	C	4082	C
- Hibiscus Street to SE 3rd Street	6	5390	3021	C	3984	C	4099	C
- SE 3rd Street to South	6	5390	3322	C	4320	C	4511	C

Traffic volumes taken from Figures 3, 6 and 7a of the traffic study
NOTE: Shaded areas represent link analysis results with valet service

Hallandale Beach Boulevard assumed as a "State Signalized Arterial - Class I", west of Dixie Highway and "Class II" east of Dixie Highway
Federal Highway assumed as a "State Signalized Arterial - Class I", south of Hallandale Beach Boulevard and a "Class II", north of Hallandale Beach Boulevard

TABLE 7 Link Evaluation - Chateau Square PM Peak Hour Analysis								
			Existing Traffic (2015)		Future Conditons (2022) w/o Project		Future Conditions (2022) with Project	
Roadway Segment	**Lanes**	**LOS "D" Capacity**	**Volume**	**LOS**	**Volume**	**LOS**	**Volume**	**LOS**
Hallandale Bch Blvd								
- West of Dixie/NE 1st Ave	6	5390	2982	C	3885	C	4235	C
- Dixie/NE 1st Ave to US 1	6	4500	2857	D	3804	D	4276	D
- US 1 to NE 8th Avenue	6	4500	3325	D	4347	D	4837	F
- US 1 to NE 8th Avenue w/valet	6	4500	3325	D	4347	D	4870	F
- NE 8th Avenue to NE 10th Ave	6	4500	3370	D	4404	D	4550	F
- NE 8th Ave to NE 10th Ave w/valet	6	4500	3370	D	4404	D	4608	F
- NE 10th Avenue to NE 14th Ave	6	4500	3672	D	4854	F	4966	F
- NE 14th Ave to East	6	4500	3212	D	4130	D	4233	D
Federal Highway								
- Pembroke Rd to Atlantic Shores	4	2920	2657	D	3399	F	3493	F
- Atlantic Shores to NE 3rd Street	4	2920	2725	D	3351	F	3445	F
- NE 3rd Street to US 1	4	2920	2567	D	3396	F	3498	F
- US 1 to Hibiscus Street	6	5390	3380	C	4452	C	4523	C
- US 1 to Hibiscus Street w/valet	6	5390	3380	C	4452	C	4571	C
- Hibiscus Street to SE 3rd Street	6	5390	3403	C	4477	C	4540	C
- SE 3rd Street to South	6	5390	3259	C	4321	C	4544	C

Traffic volumes taken from Figures 3, 6 and 7a of the traffic study
NOTE: Shaded areas represent link analysis results with valet service

Hallandale Beach Boulevard assumed as a "State Signalized Arterial - Class I", west of Dixie Highway and "Class II" east of Dixie Highway
Federal Highway assumed as a "State Signalized Arterial - Class I", south of Hallandale Beach Boulevard and a "Class II", north of Hallandale Beach Boulevard

Length of Queue

The length of queues at each study intersection is presented in Tables 8 and 9 for all scenarios (existing conditions, future conditions without the Chateau Square project, future conditions with the Chateau Square development with and without valet service for both peak periods).

TABLE 8 Chateau Square Length of Queues - AM Peak Hour							
		Queue Length (Vehicles and feet)					
	Available	Existing (Year 2015)		Background (Year 2022)		Total w/Project (Year 2022)	
Intersection/Movement	Storage (ft)	Veh	Feet	Veh	Feet	Veh	Feet
US 1/Atlantic Shores							
NB Left	175	0.5	13	0.6	15	0.6	15
NB Through	full	16.1	403	24.4	610	25.5	638
SB Left	175	6.0	150	9.3	233	9.3	233
SB Through	670	23.3	583	33.7	843	35.5	888
EB Left	full	0.1	3	0.1	3	0.1	3
EB Through	full	0.0	0	0.0	0	0.0	0
EB Right	full	0.6	15	0.7	18	0.7	18
WB Left	200	11.8	295	12.5	313	12.5	313
WB through	full	0.0	0	0.0	0	0.0	0
WB Right	full	13.4	335	16.5	413	16.5	413
US 1/NE 3rd Street							
NB Left	150	2.0	50	4.4	110	5.1	128
NB Through	full	10.4	260	14.5	363	15.3	383
SB Left	140	0.7	18	1.0	25	1.0	25
SB Through	full	16.4	410	24.0	600	25.5	638
EB Left	full	5.9	148	10.4	260	10.4	260
EB Through	50	9.9	248	12.6	315	13.0	325
WB Left	full	3.7	93	4.2	105	4.2	105
WB through	75	4.8	120	5.3	133	5.3	133
US 1/Hallandale Beach							
NB Left	480	11.7	293	25.3	633	26.8	670
NB Left w/Valet	480	n/a	n/a	n/a	n/a	29.6	740
NB Through	full	13.5	338	17.3	433	18.1	453
NB Right	400	22.0	550	48.5	1213	48.5	1213
NB Right w/Valet	400	n/a	n/a	n/a	n/a	50.3	1258
SB Left	250	23.1	578	30.5	763	36.1	903
SB Through	full	20.6	515	30.3	758	30.3	758
EB Left	440	14.8	370	16.5	413	16.5	413
EB Through	full	27.3	683	57.6	1440	74.0	1850
WB Left	350	28.0	700	41.1	1028	41.0	1025
WB Left w/Valet	350	n/a	n/a	n/a	n/a	41.2	1030
WB through	540	21.2	530	26.1	653	30.0	750
US 1/SE 3rd Street							
NB Left	270	6.9	173	7.9	198	7.9	198
NB Through	full	17.6	440	28.0	700	35.2	880
NB Right	300	0.7	18	9.5	238	10.0	250
SB Left	475	1.9	48	11.8	295	11.8	295
SB Through	full	29.7	743	75.6	1890	85.7	2143
EB Left	360	9.6	240	10.5	263	10.9	273
EB Through	full	65.8	1645	81.6	2040	81.6	2040
WB Left	500	2.0	50	15.9	398	22.3	558
WB through	500	0.7	18	1.0	25	1.2	30
WB Right	500	0.4	10	7.9	198	7.5	188

NOTE: Length of queues than changed with valet service are documented above in shaded rows.

TABLE 8 - Continues Chateau Square Length of Queues - AM Peak Hour							
		Queue Length (Vehicles and feet)					
	Available	Existing (Year 2015)		Background (Year 2022)		Total w/Project (Year 2022)	
Intersection/Movement	Storage (ft)	Veh	Feet	Veh	Feet	Veh	Feet
Dixie Hwy/Hallandale Bch							
SB Through	full	12.1	302	14.6	364	15.9	398
EB Through	full	21.2	529	31.7	792	38.7	967
WB Left	100	5.1	127	6.6	166	7.0	174
WB Through	100	3.0	75	3.3	82	3.3	82
NE 1st Ave/Hallandale Bch							
NB Left	full	10.9	273	12.5	312	12.5	312
NB Through	full	8.4	210	9.2	231	9.2	231
NB Right	125	0.4	11	0.5	13	1.8	44
EB Left	100	1.1	27	1.1	27	1.0	25
EB Through	100	8.2	204	10.5	262	13.9	348
WB through	full	15.9	398	19.2	479	21.9	547
NE 8th Ave/Hallandale Bch							
NB Left/Right	50	3.6	90	4.0	100	7.3	183
NB Left/Right w/Valet	50	n/a	n/a	n/a	n/a	7.0	175
NB Left	150	0.0	0	0.0	0	6.1	153
NB Left w/Valet	150	n/a	n/a	n/a	n/a	5.9	148
SB Left/Through	full	12.2	305	13.6	340	14.0	350
SB Right	full	13.9	348	15.4	385	15.4	385
EB Through	540	0.1	3	0.1	3	0.1	3
EB Right	125	0.0	0	0.0	0	0.0	0
WB Left	100	0.5	13	0.6	15	1.9	48
WB Left w/Valet	100	n/a	n/a	n/a	n/a	1.8	45
WB through	500	13.2	330	18.8	470	21.6	540
WB through w/Valet	500	n/a	n/a	n/a	n/a	21.5	538
NE 10th Ave/Hallandale		n/a	n/a	n/a	n/a		
NB Left	full	1.6	40	2.9	73	4.8	120
NB Left w/Valet	full	n/a	n/a	n/a	n/a	3.8	95
NB Through	full	1.9	48	3.5	88	0.0	0
NB Right	400	7.2	180	11.9	298	11.9	298
EB Left	140	7.2	180	7.9	198	8.1	203
EB Through	500	25.4	635	33.8	845	34.6	865
EB Right	50	1.9	48	3.1	78	3.0	75
WB Left	400	4.5	113	7.4	185	7.4	185
WB through	1350	20.4	510	26.2	655	27.6	690
WB Right	75	2.5	63	2.8	70	2.8	70
WB Right w/Valet	75	n/a	n/a	n/a	n/a	2.9	73
NE 14th Ave/Hallandale							
NB Left	130	9.8	245	10.5	263	10.5	263
NB Through	full	3.8	95	4.7	118	4.8	120
SB Left	140	7.5	188	8.4	210	8.4	210
SB Through	full	11.5	288	13.9	348	14.4	360
EB Left	350	8.1	203	13.7	343	14.2	355
EB Through	1350	22.7	568	30.8	770	31.5	788
EB Right	240	12.0	300	12.5	313	11.1	278
WB Left	150	4.2	105	4.8	120	4.8	120
WB Through	1350	24.9	623	34.4	860	36.0	900

NOTE: Length of queues than changed with valet service are documented above in shaded rows.

TABLE 9 Chateau Square Length of Queues - PM Peak Hour							
		Queue Length (Vehicles and feet)					
	Available	Existing (Year 2015)		Background (Year 2022)		Total w/Project (Year 2022)	
Intersection/Movement	Storage (ft)	Veh	Feet	Veh	Feet	Veh	Feet
US 1/Atlantic Shores							
NB Left	175	1.4	35	1.5	38	1.5	38
NB Through	full	32.0	800	52.3	1308	56.9	1423
SB Left	175	10.1	253	17.4	435	17.4	435
SB Through	670	20.8	520	33.1	828	34.6	865
EB Left	full	0.1	3	0.1	3	0.1	3
EB Through	full	0.0	0	0.0	0	0.0	0
EB Right	full	2.7	68	2.9	73	2.9	73
WB Left	200	10.9	273	11.5	288	11.5	288
WB through	full	0.0	0	0.0	0	0.0	0
WB Right	full	15.2	380	20.0	500	20.0	500
US 1/NE 3rd Street							0
NB Left	150	4.4	110	13.4	335	14.4	360
NB Through	full	18.0	450	25.0	625	26.6	665
SB Left	140	1.1	28	1.6	40	1.6	40
SB Through	full	18.3	458	27.5	688	28.7	718
EB Left	full	8.0	200	14.8	370	14.8	370
EB Through	50	11.9	298	15.3	383	15.7	393
WB Left	full	4.1	103	4.6	115	4.7	118
WB through	75	8.8	220	9.4	235	9.4	235
US 1/Hallandale Beach							
NB Left	480	28.1	703	46.6	1165	49.5	1238
NB Left w/Valet	480	n/a	n/a	n/a	n/a	50.9	1273
NB Through	full	18.1	453	25.8	645	28.1	703
NB Right	400	21.1	528	48.9	1223	49.0	1225
NB Right w/Valet	400	n/a	n/a	n/a	n/a	55.5	1388
SB Left	250	14.2	355	17.1	428	25.1	628
SB Through	full	23.2	580	46.0	1150	46.0	1150
EB Left	440	14.4	360	16.0	400	16.0	400
EB Through	full	25.2	630	64.3	1608	78.6	1965
WB Left	350	34.5	863	51.3	1283	51.2	1280
WB through	540	21.0	525	50.3	1258	66.7	1668
US 1/SE 3rd Street							
NB Left	270	10.8	270	12.2	305	12.2	305
NB Through	full	18.4	460	32.2	805	56.9	1423
NB Right	300	0.7	18	12.1	303	13.1	328
SB Left	475	3.1	78	11.7	293	11.7	293
SB Through	full	24.9	623	61.3	1533	70.2	1755
EB Left	360	11.1	278	12.0	300	12.2	305
EB Through	full	14.5	363	16.8	420	16.8	420
WB Left	500	8.7	218	19.2	480	30.7	768
WB through	500	5.3	133	5.6	140	5.6	140
WB Right	500	4.8	120	10.2	255	9.6	240

NOTE: Length of queues than changed with valet service are documented above in shaded rows.

TABLE 9 - Continues Chateau Square Length of Queues - PM Peak Hour							
		Queue Length (Vehicles and feet)					
	Available	Existing (Year 2015)		Background (Year 2022)		Total w/Project (Year 2022)	
Intersection/Movement	Storage (ft)	Veh	Feet	Veh	Feet	Veh	Feet
Dixie Hwy/Hallandale Bch							
SB Through	full	6.9	173	8.1	203	8.8	221
EB Through	full	19.2	481	31.5	788	37.6	940
WB Left	100	4.2	105	4.3	107	4.0	100
WB Through	100	4.5	113	42.1	1053	44.0	1099
NE 1st Ave/Hallandale Bch							
NB Left	full	14.7	368	25.9	647	25.9	647
NB Through	full	15.5	388	27.3	682	27.3	682
NB Right	125	1.4	35	3.2	81	3.5	87
EB Left	100	2.6	66	1.4	36	1.4	36
EB Through	100	11.9	297	9.5	237	13.3	333
WB through	full	23.2	581	35.6	889	43.6	1089
NE 8th Ave/Hallandale Bch							
NB Left/Right	50	6.1	153	6.9	173	12.3	308
NB Left/Right w/Valet	50	n/a	n/a	n/a	n/a	10.4	260
NB Left	150	0.0	0	0.0	0	10.2	255
NB Left w/Valet	150	n/a	n/a	n/a	n/a	9.0	225
SB Left/Through	full	11.0	275	12.1	303	12.1	303
SB Right	full	9.3	233	10.1	253	10.1	253
EB Through	540	0.1	3	0.0	0	0.1	3
EB Right	125	0.0	0	0.0	0	0.0	0
WB Left	100	0.4	10	0.5	13	2.2	55
WB Left w/Valet	100	n/a	n/a	n/a	n/a	2.1	53
WB through	500	16.5	413	25.4	635	30.2	755
WB through w/Valet	500	n/a	n/a	n/a	n/a	30.0	750
NE 10th Ave/Hallandale		n/a	n/a	n/a	n/a		
NB Left	full	4.9	123	7.2	180	13.3	333
NB Through	full	12.3	308	13.8	345	13.8	345
NB Right	400	19.9	498	46.0	1150	46.0	1150
EB Left	140	10.4	260	11.3	283	11.6	290
EB Left w/Valet	140	n/a	n/a	n/a	n/a	13.2	330
EB Through	500	24.0	600	34.8	870	36.6	915
EB Right	50	2.3	58	4.0	100	3.9	98
WB Left	400	9.5	238	14.5	363	14.5	363
WB through	1350	28.1	703	39.7	993	41.6	1040
WB Right	75	4.7	118	5.3	45	5.3	45
WB Right w/Valet	75	n/a	n/a	n/a	n/a	5.4	135
NE 14th Ave/Hallandale							
NB Left	130	12.7	318	14.0	350	14.0	350
NB Through	full	11.9	298	13.4	335	13.4	335
SB Left	140	8.5	213	9.6	240	9.6	240
SB Through	full	14.0	350	17.5	438	17.7	443
EB Left	350	25.0	625	38.1	953	39.3	983
EB Through	1350	27.2	680	59.1	1478	62.3	1558
EB Right	240	18.0	450	20.1	503	20.1	503
WB Left	150	5.7	143	6.6	165	6.6	165
WB Through	1350	36.5	913	82.2	2055	85.5	2138

NOTE: Length of queues than changed with valet service are documented above in shaded rows.

CONCLUSIONS AND RECOMMENDATONS

Chateau Square is a mixed-use development consisting of mid-rise residential units, a hotel, office space, work-live units and retail space planned to be located on the southeast corner of the intersection of Federal Highway and East Hallandale Beach Boulevard in the City of Hallandale Beach in Broward County, Florida. Traf Tech Engineering, Inc. was retained by Chateau Group LLC to conduct a traffic study in connection with the proposed mixed-use development. The study addresses trip generation, access to the site, the traffic impacts on the nearby transportation network, and potential roadway improvement intended to mitigate the new trips generated by the project, if any.

The project site is currently developed with 60,609 square feet of retail space. Access to the existing development is provided via a right-turn in/right-turn out driveway off of Federal Highway and through Hibiscus Street and NE 8th Avenue. The existing site will be redeveloped with the following land uses and intensity:

- 137,384 square feet of leasable retail/commercial use
- 280 hotel rooms
- 691 high-rise residential units
- 152,792 square feet of gross office space
- 36 work/live units

Access to the project's proposed parking structure will consist of the following:

- One full access driveway on NE 8th Avenue (for residents only) – N. Driveway
- One full access driveway on NE 8th Avenue (for commercial uses) – S. Driveway
- One full access driveway on Hibiscus St. (for commercial uses) – W. Driveway
- One full access driveway on Hibiscus St. (for residents only) – E. Driveway

Additionally, four (4) valet drop-off and pick-up locations (one on Federal Highway, one on East Hallandale Beach Boulevard and two (2) on NE 8th Avenue) are proposed for the project. The two drop-off/pick-up valet stations on the State Roadways (Federal Highway and East Hallandale Beach Boulevard) have been reviewed and approved by the FDOT.

The conclusions and recommendations of the traffic study are presented below:

- The proposed re-development project is anticipated to generate approximately 11,332 daily trips, approximately 795 AM peak hour trips (459 inbound and 336 outbound), and approximately 927 gross PM trips (399 inbound and 528 outbound).

- The four project driveways are projected to operate at an acceptable level of service as proposed.

- The maximum number of valet runners required at the Federal Highway and East Hallandale Beach Boulevard includes six (6) and 11, respectively.

- At the North Valet Drop-off Area on NE 8th Avenue the maximum number of valet runners required is six (6).

- The maximum number of valet runners required at the NE 8th Avenue South/hotel valet station is five (5).

- The hotel drop-off area provided is sufficient in order to prevent vehicles from blocking the internal circulation drive aisle.

- Hibiscus Street should extend as a 2-lane roadway from NE 8th Avenue to NE 10th Avenue (Hibiscus Street is projected to function adequately as a 2-lane roadway). Chateau Square has agreed to construct the portion of Hibiscus Street adjacent to the project site and work with the City to extend this street east to NE 14th Avenue. Additionally, the development team has provided the City Manager with information regarding the legal status of Gulfstream Way (this roadway can be used for access to Federal Highway via SE 3rd Street).

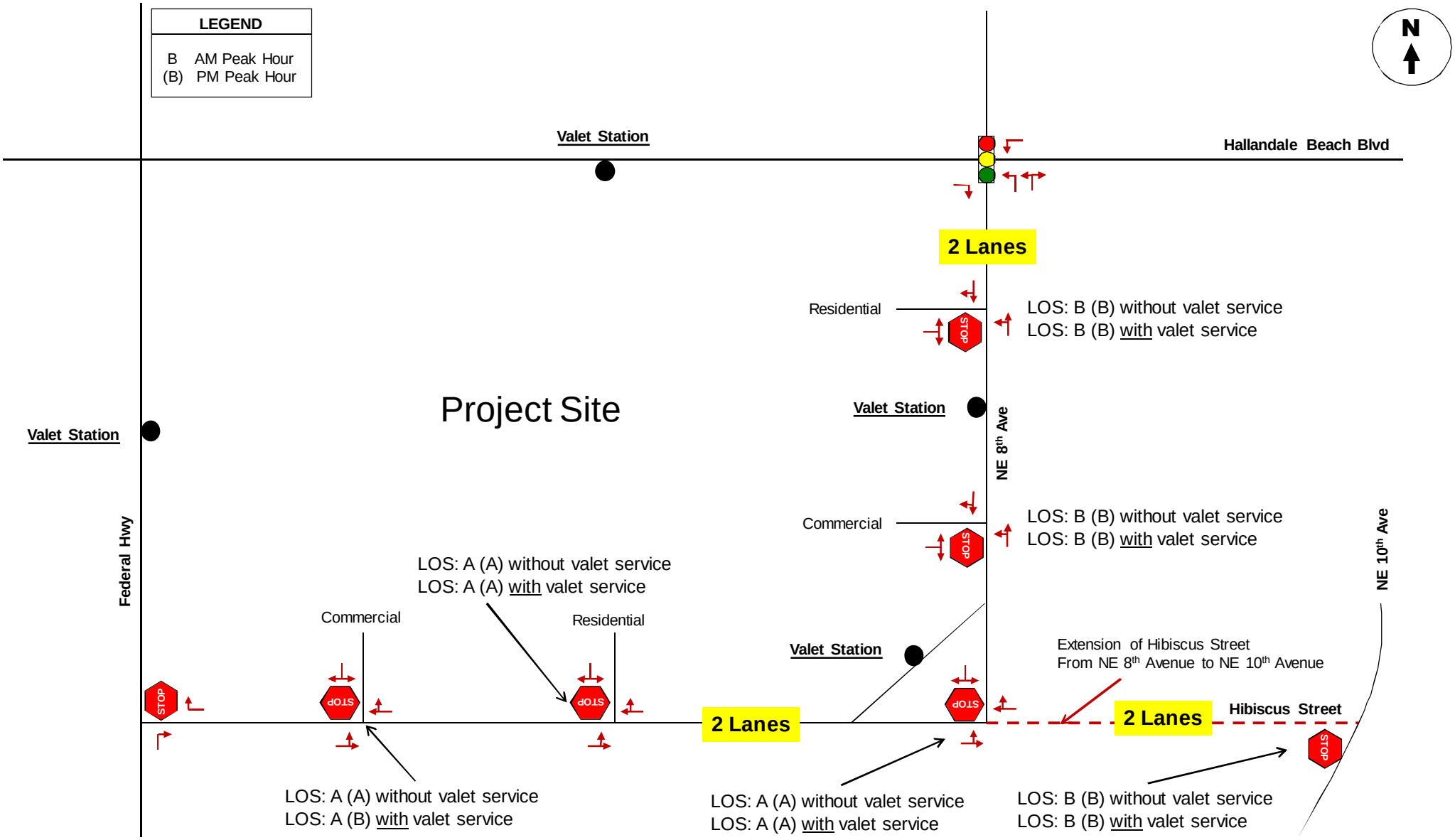
- NE 8th Avenue is projected to function adequately as a 2-lane roadway.

- The proposed four access driveways are projected to function adequately from a level of service standpoint as proposed.

The required lane configuration at the access driveways, the type of traffic control devices and the resulting levels of services at the project access points are depicted in Figure 8a. In addition to the improvements depicted in Figure 8a, the following mitigation plan is recommended in order to improve traffic conditions within the immediate impact area, as depicted in Figure 8b:

- Provide two approach lanes on NE 8th Avenue at East Hallandale Beach Boulevard. Both lanes should be assigned with one exclusive left-turn lane and a shared left-turn/right-turn lane in order to minimized northbound queues at this location (refer to Figure 8a).

- Increase the eastbound left-turn lane at the Hallandale Beach Boulevard/NE 10th Avenue intersection from approximately 140 feet to approximately 240 feet. This improvement has the potential to remove up to 90 vehicles (4 vehicles of additional storage x 22.5 cycles per hour) every hour from the eastbound through lane.



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TURN LANE AND TRAFFIC CONTROL RECOMMENDATIONS

FIGURE 8a
Chateau Square
Hallandale Beach, Florida

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ADDITIONAL MITIGATION MEASURES

FIGURE 8b
Chateau Square
Hallandale Beach, Florida

- Increase the dual northbound left-turn lane at the US 1/Hallandale Beach Boulevard intersection from approximately 475 feet to approximately 625 feet. This improvement has the potential to remove up to 264 vehicles (12 vehicles of additional storage in two lanes x 22.5 cycles per hour) every hour from the northbound through lane.

  This can be accomplished by reducing the dual south-to-east left-turn lanes at Federal Highway/SE 3rd Street from approximately 475 feet to approximately 350 feet. The results of the queueing analyses indicate that the southbound dual left-turn lanes at SE 3rd Street do not required more than 300 feet of stacking capacity.

- Modify the eastbound approach at the US 1/SE 3rd Street intersection from a separate left-turn lane and a shared through/right-turn lane to a shared left-turn/through lane and a separate right-turn lane. The eastbound right-turn volume is very heavy in the AM peak hour and long queues are formed at this location which can be significantly improved by changing the lane assignment. During the AM peak hour, this improvement reduces the eastbound right-turn queue by 600 feet and the overall intersection delay is reduced by over one minute (60 seconds).

- Re-stripe the westbound approach of the US 1/SE 3rd Street intersection to include dual westbound left-turn lanes (this can be accomplished by re-stripping the westbound through lane to a shared left-turn/through lane. This improvement reduces the westbound left-turn queue by 370 feet during the critical PM peak hour. Additionally, the overall intersection delay is reduced by approximately 50 seconds.

- Increase the eastbound left-turn lane at the Hallandale Beach Boulevard/US 1 intersection from approximately 440 feet to approximately 600 feet. This improvement has the potential to remove up to 135 vehicles (6 vehicles of additional storage x 22.5 cycles per hour) every hour from the eastbound through lane.

- Increase the dual westbound left-turn lanes at the Hallandale Beach Boulevard/US 1 intersection from approximately 350 feet to approximately 375 feet. This improvement has the potential to remove up to 45 vehicles (2 vehicles of additional storage in two lanes x 22.5 cycles per hour) every hour from the westbound through lane.

- Provide a northbound right-turn overlap phase at the intersection of US 1 and Hallandale Beach Boulevard. This improvement reduces the northbound right-turn length of queues by 615 feet in AM peak hour and by 585 feet during the PM peak period. Additionally, the northbound right-turn delay is reduced by 1.5 minutes during the PM peak hour.

- Provide a northbound right-turn overlap phase at the intersection of Hallandale Beach Boulevard and NE 10th Avenue. This improvement reduces the northbound right-turn length of queues by 505 feet and the delay by approximately one minute and 20 seconds during the PM peak period.

It is also recommended that after the project is built and occupied, the development team should contact Broward County Traffic Engineering Division in order to request that the signal timing of East Hallandale Beach Boulevard at Federal Highway, NE 8th Avenue and NE 10th Avenue as well as the intersection at Federal Highway and SE 3rd Street be reviewed and optimized by the County. This will serve as potential mitigation for the impacts created by this project.

Transportation Demand Management (TDM)

There are numerous Transportation Demand Management (TDM) strategies to influence travel decision. Some improve the transportation options available; some provide incentives to change travel mode, time or destination; others improve land use accessibility; some involve transportation policy reforms and new programs that provide a foundation for TDM. Some benefits provided by a well-thought TDM program include:

- Congestion reduction
- Road and parking savings
- Transportation Options (choices)
- Road safety
- Environmental protection
- Improved quality of life
- Economic development

The Chateau Square project proposes the following incentives in order to provide an effective TDM plan for the project:

<u>Bicycling</u>
Bicycle racks are being proposed at the site in order to encourage non-automobile modes of transportation.

<u>Carpool</u>
The proposed hotel will encourage employees to carpool. The hotel will provide a minimum of one (1) complimentary valet parking for High Occupancy Vehicle being used for Carpooling.

<u>Transit Use</u>
The hotel will have an informational kiosk within the lobby of the hotel with information relative to bus schedules and routes (five Broward County bus routes serve this site).