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By Planning and Zoning at 4:28 pm, Apr 21, 2017

**via planning, inc.**

3337 Merrick Lane, Margate, FL 33063 – 954.560.5251

April 21, 2017

via PN: 1026.07

Ms. Cory Lyn Cramer  
Planning, Zoning & Building Department  
Village of Wellington  
12300 W Forest Hill Boulevard  
Wellington, FL 33414

**Re: IPC Comprehensive Plan Amendment 17-015 (2017-011 CPA2) IPC  
Response to Comments**

Dear Ms. Cramer:

We appreciate your expedited review of the International Polo Club (IPC) Comprehensive Plan Amendment report. Below are our responses to your comments dated April 19, 2017.

1. Forest Hill Boulevard and Stribling Way intersection capacity analysis: Eliminate right turn overlap phase for northbound right turn movement. **CERTIFICATION ISSUE.**  
*Response: The intersection analysis at Forest Hill Boulevard/Stribling Way has been revised to eliminate the right-turn overlap phase.*
2. Intersection capacity analyses appear to use optimized timing. If optimized timing is used, then HCM Default Values published by Palm Beach County should be followed which does not allow any critical movements to have a v/c ratio greater than 1.0. **CERTIFICATION ISSUE.**  
*Response: The intersection capacity analyses at Forest Hill Boulevard/Stribling Way and SR 7/Stribling Way have been revised to use the existing signal timing.*

We appreciate your review and coordination and look forward to working with you and Village staff and consultant on this project.

Please let me know if you have any questions.

Sincerely,  
via planning, inc.



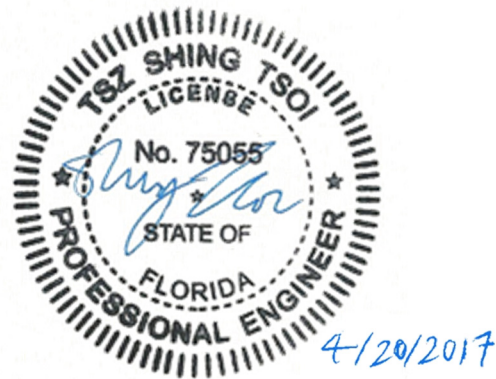
Shing Tsoi, PE, PTOE, IMSA II

# INTERNATIONAL POLO CLUB

## TRAFFIC ANALYSIS TO SUPPORT COMPREHENSIVE PLAN AMENDMENT

Parcel Control Number: 73-41-44-22-00-000-5020

Petition Number: 17-015(011CPA2)



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Shing Tsoi, P.E., PTOE, IMSA II  
Florida P.E. number: 75055  
April 20, 2017

**prepared by:**

via planning, inc.

3337 Merrick Lane

Margate, FL 33063

Phone: 954-299-6070

Certification of Authorization No. 30843

**prepared for:**

Sexton Engineering Associates, Inc.

110 Ponce de Leon Street, Suite 100

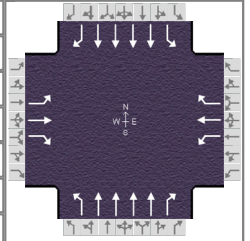
Royal Palm Beach, FL 33411

Phone: 561-792-3122

via PN: 1026.07

## HCS7 Signalized Intersection Input Data

General Information				Intersection Information			
Agency	via planning, inc.			Duration, h	0.25		
Analyst	TST	Analysis Date	Apr 19, 2017	Area Type	Other		
Jurisdiction	Wellington	Time Period	PM Peak Hour	PHF	0.95		
Urban Street	SR 7	Analysis Year	2022	Analysis Period	1 > 7:00		
Intersection	SR 7/Stribling Way		File Name	SR7-Stribling Way PM.xus			
Project Description							



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	219	211	446	221	122	52	552	3023	267	175	2610	178

Signal Information															
Cycle, s	180.0	Reference Phase	2												
Offset, s	0	Reference Point	End												
Uncoordinated	No	Simult. Gap E/W	On												
Force Mode	Float	Simult. Gap N/S	On												
		Green		17.5	47.5	39.5	19.0	19.0	0.0						
		Yellow		5.5	5.5	5.5	5.0	5.0	0.0						
		Red		2.0	2.0	2.0	2.0	3.0	0.0						

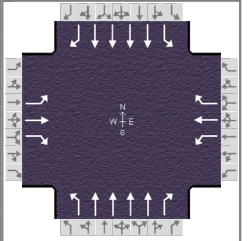
Traffic Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	219	211	446	221	122	52	552	3023	267	175	2610	178
Initial Queue (Q <sub>b</sub> ), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s <sub>0</sub> ), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N <sub>m</sub> ), man/h		None			None			None			None	
Heavy Vehicles (P <sub>HV</sub> ), %	2	2	2	2	2	2	2	2	2	2	2	2
Ped / Bike / RTOR, /h	0	0	60	0	0	52	0	0	60	0	0	60
Buses (N <sub>b</sub> ), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (AT)	3	3	3	3	3	3	3	4	3	3	4	3
Upstream Filtering (I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (W), ft	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Turn Bay Length, ft	390	0	420	1600	0	250	680	0	200	760	0	150
Grade (P <sub>g</sub> ), %		0			0			0			0	
Speed Limit, mi/h	40	40	40	40	40	40	40	40	40	40	40	40

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G <sub>max</sub> ) or Phase Split, s	26.0	27.0	26.0	27.0	47.0	102.0	25.0	80.0
Yellow Change Interval (Y), s	5.0	5.0	4.0	5.0	5.5	5.5	5.5	5.5
Red Clearance Interval (R <sub>c</sub> ), s	2.0	2.5	2.5	3.0	2.0	2.0	2.0	2.0
Minimum Green (G <sub>min</sub> ), s	4	6	4	6	4	20	4	20
Start-Up Lost Time (lt), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (e), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Passage (PT), s	2.0	4.0	4.0	4.0	3.0	4.0	2.0	4.0
Recall Mode	Off	Off	Off	Off	Off	Off	Off	Min
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Walk (Walk), s	0.0	7.0	0.0	7.0	0.0	7.0	0.0	7.0
Pedestrian Clearance Time (PC), s	0.0	36.0	0.0	36.0	0.0	17.0	0.0	23.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

# HCS7 Signalized Intersection Results Summary

General Information				Intersection Information			
Agency	via planning, inc.			Duration, h	0.25		
Analyst	TST	Analysis Date	Apr 19, 2017	Area Type	Other		
Jurisdiction	Wellington	Time Period	PM Peak Hour	PHF	0.95		
Urban Street	SR 7	Analysis Year	2022	Analysis Period	1 > 7:00		
Intersection	SR 7/Stribling Way		File Name	SR7-Stribling Way PM.xus			
Project Description							



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand ( v ), veh/h	219	211	446	221	122	52	552	3023	267	175	2610	178

Signal Information																
Cycle, s	180.0	Reference Phase	2													
Offset, s	0	Reference Point	End													
Uncoordinated	No	Simult. Gap E/W	On													
Force Mode	Float	Simult. Gap N/S	On													
		Green		17.5	47.5	39.5	19.0	19.0	0.0							
		Yellow		5.5	5.5	5.5	5.0	5.0	0.0							
		Red		2.0	2.0	2.0	2.0	3.0	0.0							

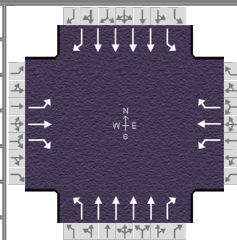
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	1.1	3.0	1.1	3.0	2.0	3.0	2.0	3.0
Phase Duration, s	26.0	27.0	26.0	27.0	47.0	102.0	25.0	80.0
Change Period, ( Y+R <sub>c</sub> ), s	7.0	8.0	6.5	8.0	7.5	7.5	7.5	7.5
Max Allow Headway ( MAH ), s	3.1	5.2	5.1	5.2	4.1	0.0	3.1	0.0
Queue Clearance Time ( g <sub>s</sub> ), s	21.0	21.0	21.5	13.9	41.5		19.5	
Green Extension Time ( g <sub>e</sub> ), s	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	1.00	1.00	1.00	1.00	1.00		1.00	

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate ( v ), veh/h	231	222	406	233	128	0	581	3182	218	184	2747	124
Adjusted Saturation Flow Rate ( s ), veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1698	1585	1781	1698	1585
Queue Service Time ( g <sub>s</sub> ), s	19.0	19.0	19.0	19.5	11.9	0.0	39.5	67.4	10.5	17.5	72.5	7.5
Cycle Queue Clearance Time ( g <sub>c</sub> ), s	19.0	19.0	19.0	19.5	11.9	0.0	39.5	67.4	10.5	17.5	72.5	7.5
Green Ratio ( g/C )	0.21	0.11	0.33	0.21	0.11	0.20	0.22	0.52	0.63	0.10	0.40	0.51
Capacity ( c ), veh/h	264	197	515	233	197	321	391	3566	1004	173	2736	806
Volume-to-Capacity Ratio ( X )	0.873	1.125	0.789	0.999	0.650	0.000	1.486	0.892	0.217	1.064	1.004	0.154
Back of Queue ( Q ), ft/ln ( 50 th percentile)	78.5	373.4	224.6	340.4	156.5	0	1094.3	592	99.8	309.1	788.8	47.5
Back of Queue ( Q ), veh/ln ( 50 th percentile)	3.1	14.7	8.8	13.4	6.2	0.0	43.1	23.3	3.9	12.2	31.1	1.9
Queue Storage Ratio ( RQ ) ( 50 th percentile)	0.20	0.00	0.53	0.21	0.00	0.00	1.61	0.00	0.50	0.41	0.00	0.32
Uniform Delay ( d <sub>1</sub> ), s/veh	66.4	80.5	11.0	66.2	77.3	0.0	70.3	22.9	14.0	81.3	41.7	3.9
Incremental Delay ( d <sub>2</sub> ), s/veh	25.0	101.7	8.5	58.5	8.3	0.0	232.2	3.9	0.5	86.3	18.2	0.4
Initial Queue Delay ( d <sub>3</sub> ), 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
Control Delay ( d ), s/veh	91.4	182.2	19.4	124.7	85.6	0.0	302.4	26.8	14.5	167.6	59.9	4.3
Level of Service ( LOS )	F	F	B	F	F		F	C	B	F	F	A
Approach Delay, s/veh / LOS	80.8		F	110.8		F	66.4		E	64.1		E
Intersection Delay, s/veh / LOS	69.0						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.9	D	3.9	D	2.5	C	2.6	C
Bicycle LOS Score / LOS	1.9	B	1.1	A	2.1	B	1.7	B

## HCS7 Signalized Intersection Intermediate Values

General Information				Intersection Information			
Agency	via planning, inc.			Duration, h	0.25		
Analyst	TST	Analysis Date	Apr 19, 2017	Area Type	Other		
Jurisdiction	Wellington	Time Period	PM Peak Hour	PHF	0.95		
Urban Street	SR 7	Analysis Year	2022	Analysis Period	1 > 7:00		
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Project Description							



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand ( v ), veh/h	219	211	446	221	122	52	552	3023	267	175	2610	178

Signal Information															
Cycle, s	180.0	Reference Phase	2												
Offset, s	0	Reference Point	End												
Uncoordinated	No	Simult. Gap E/W	On												
Force Mode	Float	Simult. Gap N/S	On												
		Green		17.5	47.5	39.5	19.0	19.0	0.0						
		Yellow		5.5	5.5	5.5	5.0	5.0	0.0						
		Red		2.0	2.0	2.0	2.0	3.0	0.0						

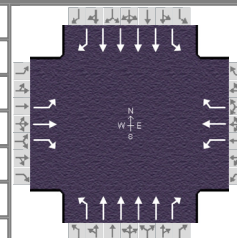
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor ( $f_w$ )	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles and Grade Factor ( $f_{HVg}$ )	0.984	0.984	0.984	0.984	0.984	0.984	0.984	0.984	0.984	0.984	0.984	0.984
Parking Activity Adjustment Factor ( $f_p$ )	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor ( $f_{bb}$ )	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor ( $f_a$ )	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Lane Utilization Adjustment Factor ( $f_{LU}$ )	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.908	1.000	1.000	0.908	1.000
Left-Turn Adjustment Factor ( $f_{LT}$ )	0.952	0.000		0.952	0.000		0.952	0.000		0.952	0.000	
Right-Turn Adjustment Factor ( $f_{RT}$ )		0.000	0.847		0.000	0.847		0.000	0.847		0.000	0.847
Left-Turn Pedestrian Adjustment Factor ( $f_{LPB}$ )	1.000			1.000			1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor ( $f_{RPB}$ )			1.000			1.000			1.000			1.000
Work Zone Adjustment Factor ( $f_{wz}$ )	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
DDI Factor ( $f_{DDI}$ )	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Movement Saturation Flow Rate (s), veh/h	1781	1870	1585	1781	1870	1585	1781	6793	1585	1781	6793	1585
Proportion of Vehicles Arriving on Green (P)	0.11	0.11	0.11	0.11	0.11	0.00	0.22	0.70	0.53	0.10	0.54	0.40
Incremental Delay Factor (k)	0.38	0.50	0.35	0.50	0.26		0.50	0.50	0.50	0.50	0.50	0.50

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time ( $t_L$ )	7.0	8.0	6.5	8.0	7.5	7.5	7.5	7.5
Green Ratio ( $g/C$ )	0.21	0.11	0.21	0.11	0.22	0.53	0.10	0.40
Permitted Saturation Flow Rate ( $s_p$ ), veh/h/ln	1262	0	1159	0	0	0	0	0
Shared Saturation Flow Rate ( $s_{sh}$ ), veh/h/ln								
Permitted Effective Green Time ( $g_p$ ), s	19.0	0.0	19.0	0.0	0.0	0.0	0.0	0.0
Permitted Service Time ( $g_u$ ), s	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Permitted Queue Service Time ( $g_{ps}$ ), s	5.1		0.0					
Time to First Blockage ( $g_t$ ), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Service Time Before Blockage ( $g_{ts}$ ), s								
Protected Right Saturation Flow ( $s_R$ ), veh/h/ln		1585		1585		1585		1585
Protected Right Effective Green Time ( $g_R$ ), s		39.5		17.5		19.5		19.0

Multimodal	EB			WB			NB			SB		
Pedestrian $F_w / F_v$	3.009	0.09	3.009	0.09	1.710	0.07	1.710	0.09				
Pedestrian $F_s / F_{delay}$	0.000	0.171	0.000	0.171	0.000	0.121	0.000	0.161				
Pedestrian $M_{corner} / M_{cw}$												
Bicycle $c_b / d_b$	216.67	71.56	211.11	72.00	1050.00	20.31	438.89	54.83				
Bicycle $F_w / F_v$	-3.64	1.42	-3.64	0.60	-3.64	1.64	-3.64	1.26				

# HCS7 Signalized Intersection Results Graphical Summary

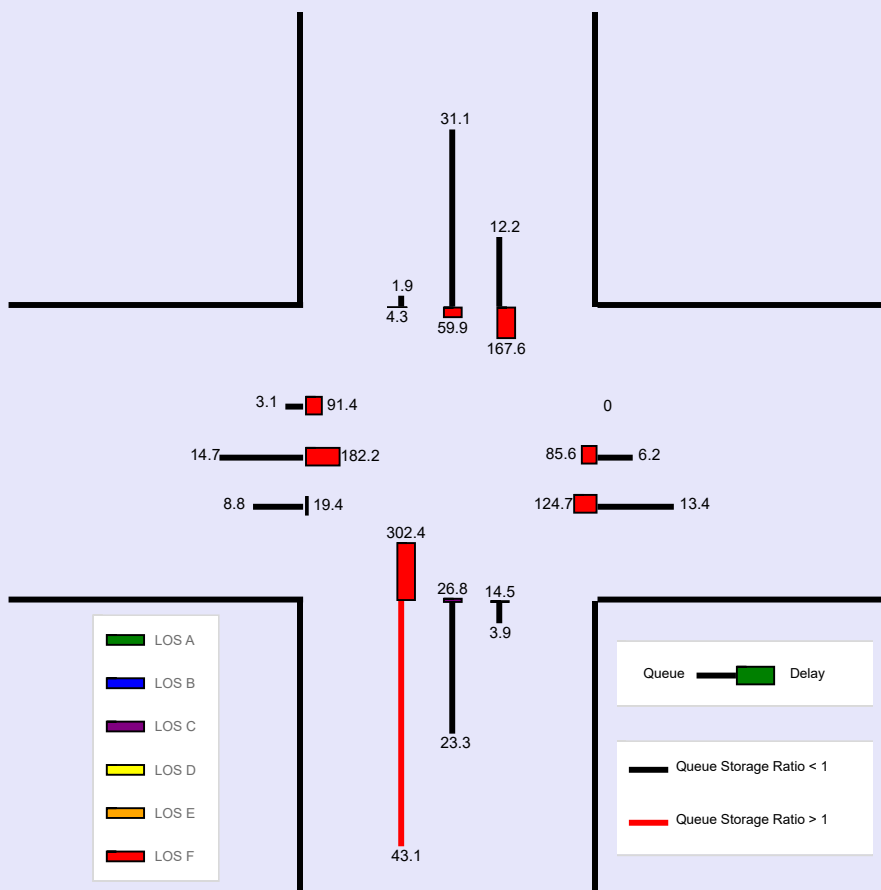
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Demand Information	EB			WB			NB			SB		
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Force Mode	Float	Simult. Gap N/S	On										
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		Yellow		5.5	5.5	5.5	5.0	5.0	0.0				
		Red		2.0	2.0	2.0	2.0	3.0	0.0				

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Back of Queue ( Q ), ft/ln ( 50 th percentile)	78.5	373.4	224.6	340.4	156.5	0	1094.3	592	99.8	309.1	788.8	47.5
Back of Queue ( Q ), veh/ln ( 50 th percentile)	3.1	14.7	8.8	13.4	6.2	0.0	43.1	23.3	3.9	12.2	31.1	1.9
Queue Storage Ratio ( RQ ) ( 50 th percentile)	0.20	0.00	0.53	0.21	0.00	0.00	1.61	0.00	0.50	0.41	0.00	0.32
Control Delay ( d ), s/veh	91.4	182.2	19.4	124.7	85.6	0.0	302.4	26.8	14.5	167.6	59.9	4.3
Level of Service (LOS)	F	F	B	F	F		F	C	B	F	F	A
Approach Delay, s/veh / LOS	80.8		F	110.8		F	66.4		E	64.1		E
Intersection Delay, s/veh / LOS	69.0						E					





**--- Messages ---**

WARNING: If demand exceeds capacity, a multiple-period analysis should be conducted.

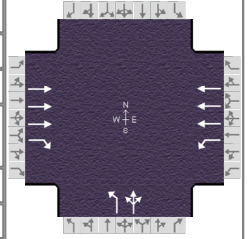
WARNING: Since queue spillover from turn lanes and spillback into upstream intersections is not accounted for in the HCM procedures, use of a simulation tool may be advised in situations where the Queue Storage Ratio exceeds 1.0.

**--- Comments ---**



## HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	via planning, inc.			Duration, h	0.25
Analyst	TST	Analysis Date	Apr 19, 2017	Area Type	Other
Jurisdiction	Wellington	Time Period	Weekday PM Peak Hour	PHF	0.95
Urban Street	Forest Hill Blvd	Analysis Year	2022	Analysis Period	1 > 7:00
Intersection	Forest Hill Blvd/Stribling...	File Name	Forest Hill-Stribling PM.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h		2249	485	132	2862		589	0	270			

Signal Information				Signal Timing and Phases													
Cycle, s	160.0	Reference Phase	2					1		2		3		4			
Offset, s	0	Reference Point	End					5		6		7		8			
Uncoordinated	No	Simult. Gap E/W	Off					Green		Yellow		Red		Green		Yellow	
Force Mode	Fixed	Simult. Gap N/S	Off					7.7		86.6		45.2		0.0		0.0	
				5.0		5.0		4.5		0.0		0.0					
				2.0		2.0		2.0		0.0		0.0					

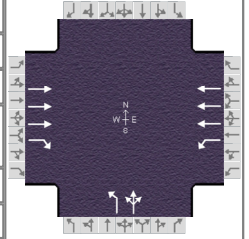
Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h		2249	485	132	2862		589	0	270			
Initial Queue (Q <sub>b</sub> ), veh/h		0	0	0	0		0	0	0			
Base Saturation Flow Rate (s <sub>0</sub> ), veh/h		1900	1900	1900	1900		1900	1900	1900			
Parking (N <sub>m</sub> ), man/h		None		None			None					
Heavy Vehicles (P <sub>HV</sub> ), %		2	2	2	2		0	2				
Ped / Bike / RTOR, /h	0	0	60	0	0		0	0	10			
Buses (N <sub>b</sub> ), buses/h		0	0	0	0		0	0	0			
Arrival Type (AT)		4	3	3	4		3	3	3			
Upstream Filtering (I)		1.00	1.00	1.00	1.00		1.00	1.00	1.00			
Lane Width (W), ft		12.0	12.0	12.0	12.0		12.0	12.0				
Turn Bay Length, ft		0	370	320	0		780	0				
Grade (P <sub>g</sub> ), %		0			0			0			0	
Speed Limit, mi/h		35	35	35	35		40	40	40			

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G <sub>max</sub> ) or Phase Split, s		83.0	18.0	101.0		59.0		
Yellow Change Interval (Y), s		5.0	5.0	5.0		4.5		
Red Clearance Interval (R <sub>c</sub> ), s		2.0	2.0	2.0		2.0		
Minimum Green (G <sub>min</sub> ), s		20	4	20	6	6		
Start-Up Lost Time (I <sub>t</sub> ), s		2.0	2.0	2.0	2.0	2.0		
Extension of Effective Green (e), s		2.0	2.0	2.0	2.0	2.0		
Passage (PT), s		4.0	2.0	4.0	2.0	3.0		
Recall Mode		Min	Off	Min	Off	Off		
Dual Entry		Yes	No	Yes	No	Yes		
Walk (Walk), s		7.0	0.0	0.0	0.0	7.0		
Pedestrian Clearance Time (PC), s		11.0	0.0	0.0	0.0	28.0		

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25			
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0			
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No			
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0			
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50				

## HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	via planning, inc.			Duration, h	0.25
Analyst	TST	Analysis Date	Apr 19, 2017	Area Type	Other
Jurisdiction	Wellington	Time Period	Weekday PM Peak Hour	PHF	0.95
Urban Street	Forest Hill Blvd	Analysis Year	2022	Analysis Period	1 > 7:00
Intersection	Forest Hill Blvd/Stribling...	File Name	Forest Hill-Stribling PM.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand ( v ), veh/h		2249	485	132	2862		589	0	270			

Signal Information												
Cycle, s	160.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	Off									
Force Mode	Fixed	Simult. Gap N/S	Off									
		Green	7.7	86.6	45.2	0.0	0.0	0.0				
		Yellow	5.0	5.0	4.5	0.0	0.0	0.0				
		Red	2.0	2.0	2.0	0.0	0.0	0.0				

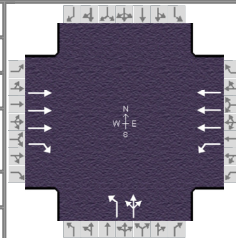
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		6	5	2		4		
Case Number		7.3	1.0	4.0		10.0		
Phase Duration, s		93.6	14.7	108.3		51.7		
Change Period, ( Y+R <sub>c</sub> ), s		7.0	7.0	7.0		6.5		
Max Allow Headway ( MAH ), s		0.0	3.1	0.0		4.2		
Queue Clearance Time ( g <sub>s</sub> ), s			7.6			42.4		
Green Extension Time ( g <sub>e</sub> ), s		0.0	0.2	0.0		2.8		
Phase Call Probability			1.00			1.00		
Max Out Probability			0.00			0.29		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		6	16	5	2		7	4	14			
Adjusted Flow Rate ( v ), veh/h		2367	447	139	3013		465	429				
Adjusted Saturation Flow Rate ( s ), veh/h/ln		1698	1585	1781	1698		1810	1666				
Queue Service Time ( g <sub>s</sub> ), s		54.4	28.9	5.6	69.6		39.7	40.4				
Cycle Queue Clearance Time ( g <sub>c</sub> ), s		54.4	28.9	5.6	69.6		39.7	40.4				
Green Ratio ( g/C )		0.54	0.54	0.60	0.63		0.28	0.28				
Capacity ( c ), veh/h		2757	858	161	3226		511	470				
Volume-to-Capacity Ratio ( X )		0.859	0.522	0.862	0.934		0.910	0.911				
Back of Queue ( Q ), ft/ln ( 50 th percentile)		458.2	287.4	81.8	382.3		505.8	506.6				
Back of Queue ( Q ), veh/ln ( 50 th percentile)		18.0	11.3	3.2	15.1		20.2	19.9				
Queue Storage Ratio ( RQ ) ( 50 th percentile)		0.00	0.78	0.26	0.00		0.65	0.00				
Uniform Delay ( d <sub>1</sub> ), s/veh		17.8	23.5	35.8	10.0		55.5	63.6				
Incremental Delay ( d <sub>2</sub> ), s/veh		3.7	2.3	5.2	6.5		16.7	17.9				
Initial Queue Delay ( d <sub>3</sub> ), s/veh		0.0	0.0	0.0	0.0		0.0	0.0				
Control Delay ( d ), s/veh		21.5	25.7	40.9	16.4		72.1	81.5				
Level of Service ( LOS )		C	C	D	B		E	F				
Approach Delay, s/veh / LOS	22.2	C		17.5	B		76.6	E		0.0		
Intersection Delay, s/veh / LOS	27.1						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	1.9	B	3.4	C	3.4	C
Bicycle LOS Score / LOS	2.0	B	2.2	B	2.0	B		A

## HCS7 Signalized Intersection Intermediate Values

General Information				Intersection Information	
Agency	via planning, inc.			Duration, h	0.25
Analyst	TST	Analysis Date	Apr 19, 2017	Area Type	Other
Jurisdiction	Wellington	Time Period	Weekday PM Peak Hour	PHF	0.95
Urban Street	Forest Hill Blvd	Analysis Year	2022	Analysis Period	1 > 7:00
Intersection	Forest Hill Blvd/Stribling...	File Name	Forest Hill-Stribling PM.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h		2249	485	132	2862		589	0	270			

Signal Information													
Cycle, s	160.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	Off										
Force Mode	Fixed	Simult. Gap N/S	Off										
		Green	7.7	86.6	45.2	0.0	0.0	0.0					
		Yellow	5.0	5.0	4.5	0.0	0.0	0.0					
		Red	2.0	2.0	2.0	0.0	0.0	0.0					

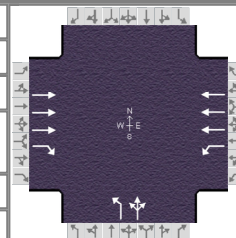
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor ( $f_w$ )	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000			
Heavy Vehicles and Grade Factor ( $f_{HVg}$ )	0.984	0.984	0.984	0.984	0.984	0.984	1.000	0.984	1.000			
Parking Activity Adjustment Factor ( $f_p$ )	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.000
Bus Blockage Adjustment Factor ( $f_{bb}$ )	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.000
Area Type Adjustment Factor ( $f_a$ )	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000			
Lane Utilization Adjustment Factor ( $f_{LU}$ )	1.000	0.908	1.000	1.000	0.908	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Left-Turn Adjustment Factor ( $f_{LT}$ )	1.000	1.000		0.952	0.000		0.952	0.000				
Right-Turn Adjustment Factor ( $f_{RT}$ )		0.000	0.847		1.000	1.000		0.847	0.847			
Left-Turn Pedestrian Adjustment Factor ( $f_{LPB}$ )	1.000			1.000			1.000					
Right-Turn Ped-Bike Adjustment Factor ( $f_{RPB}$ )			1.000			1.000			1.000			
Work Zone Adjustment Factor ( $f_{wz}$ )	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000			
DDI Factor ( $f_{DDI}$ )	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000			
Movement Saturation Flow Rate (s), veh/h	0	5267	1585	1781	5267	0	1810	0	1666			
Proportion of Vehicles Arriving on Green (P)	0.00	0.72	0.54	0.05	0.84	0.00	0.28	0.00	0.28	0.00	0.00	0.00
Incremental Delay Factor (k)		0.50	0.50	0.04	0.50		0.33	0.33				

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time ( $t_L$ )		7.0	7.0	7.0		4.0		
Green Ratio ( $g/C$ )		0.54	0.60	0.63		0.28		
Permitted Saturation Flow Rate ( $s_p$ ), veh/h/ln		80	150	0		1810		
Shared Saturation Flow Rate ( $s_{sh}$ ), veh/h/ln		0						
Permitted Effective Green Time ( $g_p$ ), s		0.0	88.6	0.0		0.0		
Permitted Service Time ( $g_u$ ), s		0.0	32.0	0.0		0.0		
Permitted Queue Service Time ( $g_{ps}$ ), s			32.0					
Time to First Blockage ( $g_i$ ), s		86.6	0.0	0.0		0.0		
Queue Service Time Before Blockage ( $g_{ts}$ ), s								
Protected Right Saturation Flow ( $s_R$ ), veh/h/ln		0						
Protected Right Effective Green Time ( $g_R$ ), s		0.0						

Multimodal	EB			WB			NB			SB		
Pedestrian $F_w / F_v$	1.557	0.01	1.198	0.01	2.545	0.09	2.545	0.09				
Pedestrian $F_s / F_{delay}$	0.000	0.113	0.000	0.095	0.000	0.179	0.000	0.178				
Pedestrian $M_{corner} / M_{cw}$												
Bicycle $c_b / d_b$	1082.44	16.84	1266.57	10.76	-93.75	87.68	-62.50	85.08				
Bicycle $F_w / F_v$	-3.64	1.55	-3.64	1.70	-3.64	1.47	-3.64					

# HCS7 Signalized Intersection Results Graphical Summary

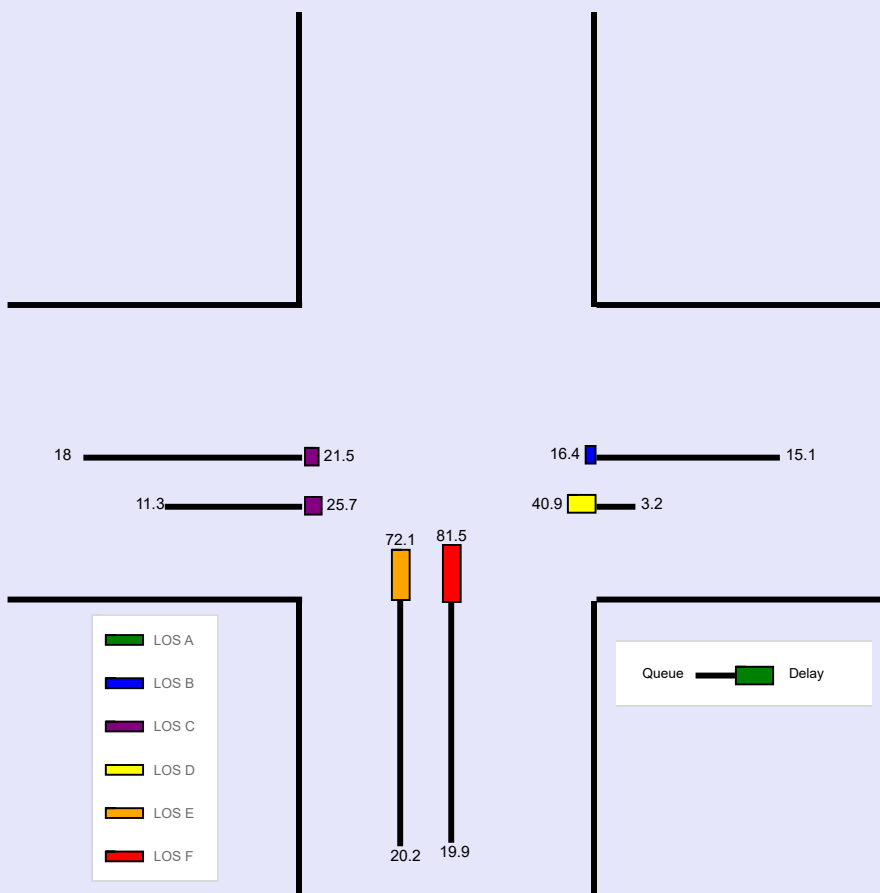
General Information				Intersection Information	
Agency	via planning, inc.			Duration, h	0.25
Analyst	TST	Analysis Date	Apr 19, 2017	Area Type	Other
Jurisdiction	Wellington	Time Period	Weekday PM Peak Hour	PHF	0.95
Urban Street	Forest Hill Blvd	Analysis Year	2022	Analysis Period	1 > 7:00
Intersection	Forest Hill Blvd/Stribling...	File Name	Forest Hill-Stribling PM.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand ( v ), veh/h		2249	485	132	2862		589	0	270			

Signal Information													
Cycle, s	160.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	Off	Green	7.7	86.6	45.2	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	Off	Yellow	5.0	5.0	4.5	0.0	0.0	0.0			
				Red	2.0	2.0	2.0	0.0	0.0	0.0			

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Back of Queue ( Q ), ft/ln ( 50 th percentile)		458.2	287.4	81.8	382.3		505.8	506.6				
Back of Queue ( Q ), veh/ln ( 50 th percentile)		18.0	11.3	3.2	15.1		20.2	19.9				
Queue Storage Ratio ( RQ ) ( 50 th percentile)		0.00	0.78	0.26	0.00		0.65	0.00				
Control Delay ( d ), s/veh		21.5	25.7	40.9	16.4		72.1	81.5				
Level of Service (LOS)		C	C	D	B		E	F				
Approach Delay, s/veh / LOS	22.2	C		17.5	B		76.6	E		0.0		
Intersection Delay, s/veh / LOS	27.1						C					





**--- Messages ---**

WARNING: The shared-plus-exclusive turn lane solution is an approximation of the HCM method, because more than three lane groups cannot be accommodated. Input data for Percent Turns in Shared Lane are used to specify proportion of turning vehicles in the shared lane.

**--- Comments ---**

## Arterial Analysis

**Urban Street:** Stribling Way  
**Speed Limit:** 40  
**Analysis Year:** 2022  
**Time Period:** Weekday PM Peak Hour

		<b>SB/EB</b>
<b>Intersection/Segment</b>	<b>Distance (ft)</b>	<b>Travel Time/ Delay (sec)</b>
SR 7/Stribling Way*		182.2
SR 7 to Pierson Rd	5,700	97.2
Pierson Rd/Stribling Way		6.8
Pierson Rd to Forest Hill Blvd	4,950	84.4
Forest Hill Blvd/Stribling Way		25.7
<b>Arterial Total</b>	<b>10,650</b>	<b>396</b>
<b>Arterial Speed</b>		<b>18.3</b>
<b>Arterial LOS</b>		<b>D</b>

As shown in Table 4B, the total traffic peak hour directional volumes on Stribling Way between Pierson Road and SR 7 exceed the applicable thresholds. Therefore, the following intersections were analyzed:

- Stribling Way/Pierson Road (weekday PM peak hour only)
- SR 7/Stribling Way (weekday PM peak hour only)

In addition, arterial analysis was conducted on Stribling Way in the southbound/eastbound direction between SR 7 and Forest Hill Boulevard during weekday PM peak hour.

The historical volumes were adjusted to reflect year 2017 volumes by applying an areawide annual growth rate of 3.68% on the raw traffic counts, and the resulting volumes are included in Appendix D. Appendix D also includes the committed trips, 2022 background volumes, the trip distribution and trip assignment by the subject property, and the 2022 total project traffic.

All analyses were completed using *2010 Highway Capacity Software (HCS 2010)* which is based on the *2010 Highway Capacity Manual* methodologies. Signal timing sheets are included in Appendix E. The HCS output sheets and the arterial analysis summary are included in Appendix F. Table 5 summarizes the intersection operational results. Table 6 summarizes the arterial analysis results. Both show all analyzed intersections and segments meet the requirements for 5-year analyses.

Table 5 –Intersection Results

Intersection	Control Type	Year 2022 LOS
		Weekday PM
Stribling Way/Pierson Road	Roundabout	C
SR 7/Stribling Way	Signal	E

Note: critical lane group LOS is reported for roundabouts. Intersection LOS is reported for signals.

Table 6 –Arterial Analysis Results

Segment	Direction	Year 2022 LOS / Speed
		Weekday PM
Stribling Way from SR 7 to Forest Hill Boulevard	Southbound/ Eastbound	D / 18.3 mph