

Lanes, Volumes, Timings
1: N. Courtenay Pkwy & Pioneer Rd

2-2027 NO BUILD AM PEAK HOUR

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	28	30	174	42	163	32	1098	86	207	1582	34
Future Volume (vph)	96	28	30	174	42	163	32	1098	86	207	1582	34
Confl. Peds. (#/hr)									1			
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
Heavy Vehicles (%)	3%	4%	2%	2%	6%	2%	25%	3%	2%	2%	3%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	169	0	0	237	179	35	1207	95	227	1775	0
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4	6		6	2		
Detector Phase	8	8		4	4	4	1	6	6	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	5.0	15.0	15.0	5.0	15.0	
Minimum Split (s)	41.7	41.7		40.7	40.7	40.7	12.8	30.8	30.8	12.8	32.8	
Total Split (s)	50.0	50.0		50.0	50.0	50.0	18.0	75.0	75.0	35.0	92.0	
Total Split (%)	31.3%	31.3%		31.3%	31.3%	31.3%	11.3%	46.9%	46.9%	21.9%	57.5%	
Maximum Green (s)	43.3	43.3		43.3	43.3	43.3	10.2	68.2	68.2	27.2	85.2	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	4.8	4.8	4.8	4.8	4.8	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	2.0	2.0	3.0	2.0	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.7			6.7	6.7	7.8	6.8	6.8	7.8	6.8	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.5	3.5		3.5	3.5	3.5	3.0	3.5	3.5	3.0	3.5	
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0	7.0		7.0	
Flash Don't Walk (s)	28.0	28.0		27.0	27.0	27.0		17.0	17.0		19.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0	0		0	
Act Effct Green (s)		36.7			36.7	36.7	89.4	83.4	83.4	108.8	97.6	
Actuated g/C Ratio		0.23			0.23	0.23	0.56	0.52	0.52	0.68	0.61	
v/c Ratio		0.94			0.87	0.39	0.35	0.68	0.11	0.70	0.86	
Control Delay (s/veh)		108.9			88.9	14.8	28.8	33.6	1.5	25.5	41.4	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay (s/veh)		108.9			88.9	14.8	28.8	33.6	1.5	25.5	41.4	
LOS		F			F	B	C	C	A	C	D	
Approach Delay (s/veh)		108.9			57.0			31.2			39.6	
Approach LOS		F			E			C			D	
Queue Length 50th (ft)		167			239	32	12	495	0	121	876	
Queue Length 95th (ft)		#292			#339	99	38	687	13	m171	m#1092	
Internal Link Dist (ft)		649			211			778			658	
Turn Bay Length (ft)						125	150		105	245		
Base Capacity (vph)		212			320	516	129	1765	842	403	2060	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		0.80			0.74	0.35	0.27	0.68	0.11	0.56	0.86	
Intersection Summary												

Synchro 12 Report

Lanes, Volumes, Timings

2-2027 NO BUILD AM PEAK HOUR

1: N. Courtenay Pkwy & Pioneer Rd

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 135 (84%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay (s/veh): 41.5

Intersection LOS: D

Intersection Capacity Utilization 82.3%

ICU Level of Service E

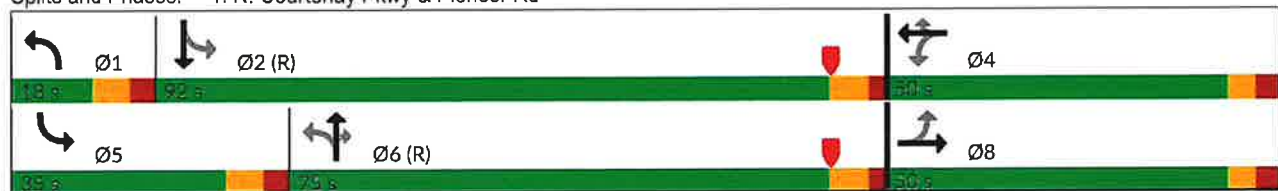
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: N. Courtenay Pkwy & Pioneer Rd



HCM 7th Signalized Intersection Summary
1: N. Courtenay Pkwy & Pioneer Rd

2-2027 NO BUILD AM PEAK HOUR

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	28	30	174	42	163	32	1098	86	207	1582	34
Future Volume (veh/h)	96	28	30	174	42	163	32	1098	86	207	1582	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	1.00		1.00	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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1841	1870	1870	1811	1870	1530	1856	1870	1870	1856	1796
Adj Flow Rate, veh/h	105	31	28	191	46	124	35	1207	43	227	1738	36
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, %	3	4	2	2	6	2	25	3	2	2	3	7
Cap, veh/h	231	68	54	253	51	316	213	2116	950	340	2271	47
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.02	0.60	0.60	0.14	1.00	1.00
Sat Flow, veh/h	974	340	270	1068	257	1585	1457	3526	1584	1781	3532	73
Grp Volume(v), veh/h	164	0	0	237	0	124	35	1207	43	227	865	909
Grp Sat Flow(s),veh/h/ln	1584	0	0	1325	0	1585	1457	1763	1584	1781	1763	1842
Q Serve(g_s), s	0.0	0.0	0.0	13.5	0.0	10.9	1.5	33.3	1.8	8.3	0.0	0.0
Cycle Q Clear(g_c), s	14.5	0.0	0.0	28.1	0.0	10.9	1.5	33.3	1.8	8.3	0.0	0.0
Prop In Lane	0.64		0.17	0.81		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	352	0	0	305	0	316	213	2116	950	340	1133	1185
V/C Ratio(X)	0.47	0.00	0.00	0.78	0.00	0.39	0.16	0.57	0.05	0.67	0.76	0.77
Avail Cap(c_a), veh/h	456	0	0	403	0	429	270	2116	950	522	1133	1185
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.1	0.0	0.0	62.8	0.0	55.7	11.5	19.5	13.2	15.6	0.0	0.0
Incr Delay (d2), s/veh	1.2	0.0	0.0	7.5	0.0	1.0	0.4	1.1	0.1	2.3	4.9	4.8
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	10.1	0.0	0.0	15.3	0.0	8.0	0.9	19.3	1.2	5.1	2.8	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	58.2	0.0	0.0	70.4	0.0	56.6	11.9	20.6	13.2	17.9	4.9	4.8
LnGrp LOS	E			E		E	B	C	B	B	A	A
Approach Vol, veh/h		164			361			1285			2001	
Approach Delay, s/veh		58.2			65.6			20.1			6.3	
Approach LOS		E			E			C			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.7	109.7		38.6	18.6	102.8		38.6				
Change Period (Y+Rc), s	7.8	6.8		6.7	7.8	6.8		6.7				
Max Green Setting (Gmax), s	10.2	85.2		43.3	27.2	68.2		43.3				
Max Q Clear Time (g_c+l1), s	3.5	2.0		30.1	10.3	35.3		16.5				
Green Ext Time (p_c), s	0.0	29.6		1.8	0.5	12.3		1.1				
Intersection Summary												
HCM 7th Control Delay, s/veh			18.8									
HCM 7th LOS			B									

Synchro 12 Report

Lanes, Volumes, Timings

2-2027 NO BUILD AM PEAK HOUR

2: N. Courtenay Pkwy & S.R. 528 EB on-off Ramps

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SEB	SEB	SBR
Lane Configurations												
Traffic Volume (vph)	857	0	971	0	0	0	0	1134	342	263	1005	0
Future Volume (vph)	857	0	971	0	0	0	0	1134	342	263	1005	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	6%	2%	2%	2%	2%	2%	2%	2%	2%	7%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	912	0	1033	0	0	0	0	1206	364	280	1069	0
Turn Type	Prot		Prot					NA	Perm	Prot	NA	
Protected Phases	7		7					6		5	2	
Permitted Phases									6			
Detector Phase	7		7					6	6	5	2	
Switch Phase												
Minimum Initial (s)	5.0		5.0					12.0	12.0	5.0	12.0	
Minimum Split (s)	9.5		9.5					25.4	25.4	25.8	25.4	
Total Split (s)	60.0		60.0					64.0	64.0	36.0	100.0	
Total Split (%)	37.5%		37.5%					40.0%	40.0%	22.5%	62.5%	
Maximum Green (s)	55.5		55.5					56.6	56.6	28.2	92.6	
Yellow Time (s)	3.5		3.5					4.8	4.8	4.8	4.8	
All-Red Time (s)	1.0		1.0					2.6	2.6	3.0	2.6	
Lost Time Adjust (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5		4.5					7.4	7.4	7.8	7.4	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0		3.0					4.0	4.0	4.0	4.0	
Recall Mode	None		None					C-Max	C-Max	None	C-Max	
Act Effct Green (s)	55.1		55.1					56.6	56.6	28.6	93.0	
Actuated g/C Ratio	0.34		0.34					0.35	0.35	0.18	0.58	
v/c Ratio	0.80		0.97					0.69	0.47	1.00	0.56	
Control Delay (s/veh)	53.9		63.6					62.2	22.9	96.0	15.9	
Queue Delay	3.3		0.0					3.6	0.0	0.0	0.8	
Total Delay (s/veh)	57.2		63.6					65.9	22.9	96.0	16.7	
LOS	E		E					E	C	F	B	
Approach Delay (s/veh)		60.6						55.9			33.1	
Approach LOS		E						E			C	
Queue Length 50th (ft)	444		530					474	160	~304	453	
Queue Length 95th (ft)	529		#695					522	m283	#506	527	
Internal Link Dist (ft)		674			677			1602			365	
Turn Bay Length (ft)	385		385						725			
Base Capacity (vph)	1145		1074					1739	776	281	1919	
Starvation Cap Reductn	0		0					0	0	0	500	
Spillback Cap Reductn	148		0					431	0	0	0	
Storage Cap Reductn	0		0					0	0	0	0	
Reduced v/c Ratio	0.91		0.96					0.92	0.47	1.00	0.75	
Intersection Summary												
Cycle Length: 160												
Actuated Cycle Length: 160												
Offset: 73 (46%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow												
Natural Cycle: 90												

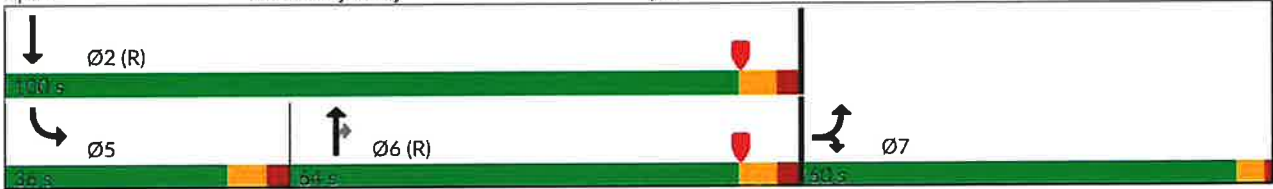
Synchro 12 Report

Lanes, Volumes, Timings
2: N. Courtenay Pkwy & S.R. 528 EB on-off Ramps

2-2027 NO BUILD AM PEAK HOUR

Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay (s/veh): 51.5	Intersection LOS: D
Intersection Capacity Utilization 125.1%	ICU Level of Service H
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 2: N. Courtenay Pkwy & S.R. 528 EB on-off Ramps



HCM 7th Signalized Intersection Summary
2: N. Courtenay Pkwy & S.R. 528 EB on-off Ramps

2-2027 NO BUILD AM PEAK HOUR

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	857	0	971	0	0	0	0	1134	342	263	1005	0
Future Volume (veh/h)	857	0	971	0	0	0	0	1134	342	263	1005	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	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
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1811	0	1870				0	1870	1870	1796	1870	0
Adj Flow Rate, veh/h	912	0	0				0	1206	0	280	1069	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	6	0	2				0	2	2	7	2	0
Cap, veh/h	989	0					0	2072		300	2239	0
Arrive On Green	0.30	0.00	0.00				0.00	0.13	0.00	0.06	0.21	0.00
Sat Flow, veh/h	3346	0	2790				0	5274	1585	1711	3647	0
Grp Volume(v), veh/h	912	0	0				0	1206	0	280	1069	0
Grp Sat Flow(s),veh/h/ln	1673	0	1395				0	1702	1585	1711	1777	0
Q Serve(g_s), s	42.2	0.0	0.0				0.0	35.5	0.0	26.1	42.3	0.0
Cycle Q Clear(g_c), s	42.2	0.0	0.0				0.0	35.5	0.0	26.1	42.3	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	989	0					0	2072		300	2239	0
V/C Ratio(X)	0.92	0.00					0.00	0.58		0.93	0.48	0.00
Avail Cap(c_a), veh/h	1161	0					0	2072		302	2239	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	0.33	0.33	0.33	0.33	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	0.00	0.85	0.85	0.00
Uniform Delay (d), s/veh	54.6	0.0	0.0				0.0	56.5	0.0	74.4	40.2	0.0
Incr Delay (d2), s/veh	11.0	0.0	0.0				0.0	1.2	0.0	31.2	0.6	0.0
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	26.7	0.0	0.0				0.0	23.2	0.0	20.4	27.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	65.5	0.0	0.0				0.0	57.7	0.0	105.6	40.8	0.0
LnGrp LOS	E							E		F	D	
Approach Vol, veh/h		912						1206			1349	
Approach Delay, s/veh		65.5						57.7			54.3	
Approach LOS		E						E			D	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		108.2		51.8	35.9	72.3						
Change Period (Y+Rc), s		7.4		4.5	7.8	7.4						
Max Green Setting (Gmax), s		92.6		55.5	28.2	56.6						
Max Q Clear Time (g_c+I1), s		44.3		44.2	28.1	37.5						
Green Ext Time (p_c), s		13.5		3.0	0.0	10.2						

Intersection Summary

HCM 7th Control Delay, s/veh	58.4
HCM 7th LOS	E

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lanes, Volumes, Timings

2-2027 NO BUILD AM PEAK HOUR

3: N. Courtenay Pkwy & S.R. 528 WB on-off Ramps

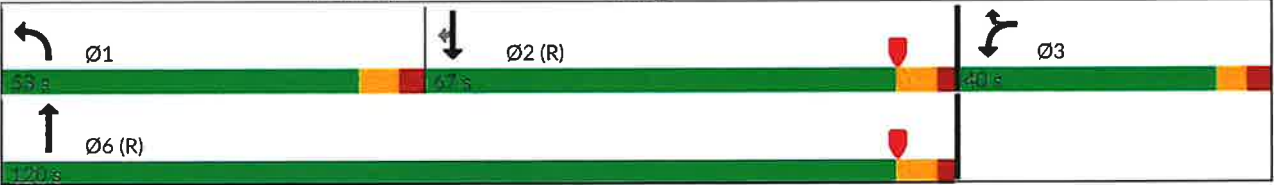
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	236	0	427	531	1585	0	0	1130	514
Future Volume (vph)	0	0	0	236	0	427	531	1585	0	0	1130	514
Confl. Peds. (#/hr)						1						
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	2%	2%	2%	4%	3%	4%	2%	2%	4%	10%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	254	0	459	571	1704	0	0	1215	553
Turn Type				Prot		Perm	Prot	NA			NA	Perm
Protected Phases				3			1	6			2	
Permitted Phases						3						2
Detector Phase				3		3	1	6			2	2
Switch Phase												
Minimum Initial (s)				7.0		7.0	5.0	12.0			12.0	12.0
Minimum Split (s)				14.0		14.0	22.5	22.5			22.5	22.5
Total Split (s)				40.0		40.0	53.0	120.0			67.0	67.0
Total Split (%)				25.0%		25.0%	33.1%	75.0%			41.9%	41.9%
Maximum Green (s)				33.0		33.0	45.1	112.5			59.5	59.5
Yellow Time (s)				4.0		4.0	4.8	5.3			5.3	5.3
All-Red Time (s)				3.0		3.0	3.1	2.2			2.2	2.2
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				7.0		7.0	7.9	7.5			7.5	7.5
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0		3.0	3.0	3.0			4.0	4.0
Recall Mode				None		None	Min	C-Max			C-Max	C-Max
Act Effct Green (s)				33.0		33.0	32.3	112.5			72.3	72.3
Actuated g/C Ratio				0.21		0.21	0.20	0.70			0.45	0.45
v/c Ratio				0.36		1.20	0.83	0.70			0.54	0.72
Control Delay (s/veh)				56.1		154.3	64.2	36.3			33.5	28.7
Queue Delay				0.0		0.0	0.3	48.5			0.3	0.0
Total Delay (s/veh)				56.1		154.3	64.5	84.8			33.8	28.7
LOS				E		F	E	F			C	C
Approach Delay (s/veh)					119.3			79.7			32.2	
Approach LOS					F			E			C	
Queue Length 50th (ft)				119		~506	278	952			334	306
Queue Length 95th (ft)				163		#735	335	1026			411	501
Internal Link Dist (ft)		690			789			365			641	
Turn Bay Length (ft)				150		275						90
Base Capacity (vph)				708		383	958	2440			2253	767
Starvation Cap Reductn				0		0	78	1081			0	0
Spillback Cap Reductn				0		0	0	0			447	0
Storage Cap Reductn				0		0	0	0			0	0
Reduced v/c Ratio				0.36		1.20	0.65	1.25			0.67	0.72
Intersection Summary												
Cycle Length: 160												
Actuated Cycle Length: 160												

Synchro 12 Report

3: N. Courtenay Pkwy & S.R. 528 WB on-off Ramps

Offset: 25 (16%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay (s/veh): 68.0	Intersection LOS: E
Intersection Capacity Utilization 125.1%	ICU Level of Service H
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 3: N. Courtenay Pkwy & S.R. 528 WB on-off Ramps



HCM 7th Signalized Intersection Summary
3: N. Courtenay Pkwy & S.R. 528 WB on-off Ramps

2-2027 NO BUILD AM PEAK HOUR

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	236	0	427	531	1585	0	0	1130	514
Future Volume (veh/h)	0	0	0	236	0	427	531	1585	0	0	1130	514
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Lane Width Adj.				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	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
Work Zone On Approach				No				No				No
Adj Sat Flow, veh/h/ln				1870	0	1841	1856	1841	0	0	1841	1752
Adj Flow Rate, veh/h				254	0	389	571	1704	0	0	1215	422
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				2	0	4	3	4	0	0	4	10
Cap, veh/h				713	0	322	627	2459	0	0	2366	685
Arrive On Green				0.21	0.00	0.21	0.37	1.00	0.00	0.00	0.47	0.47
Sat Flow, veh/h				3456	0	1560	3428	3589	0	0	5191	1454
Grp Volume(v), veh/h				254	0	389	571	1704	0	0	1215	422
Grp Sat Flow(s),veh/h/ln				1728	0	1560	1714	1749	0	0	1675	1454
Q Serve(g_s), s				10.1	0.0	33.0	25.3	0.0	0.0	0.0	27.0	34.6
Cycle Q Clear(g_c), s				10.1	0.0	33.0	25.3	0.0	0.0	0.0	27.0	34.6
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				713	0	322	627	2459	0	0	2366	685
V/C Ratio(X)				0.36	0.00	1.21	0.91	0.69	0.00	0.00	0.51	0.62
Avail Cap(c_a), veh/h				713	0	322	966	2459	0	0	2366	685
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.59	0.59	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				54.4	0.0	63.5	49.5	0.0	0.0	0.0	29.5	31.6
Incr Delay (d2), s/veh				0.3	0.0	119.5	5.5	1.0	0.0	0.0	0.8	4.1
Initial Q Delay(d3), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				7.7	0.0	34.5	13.4	0.6	0.0	0.0	16.2	18.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh				54.7	0.0	183.0	55.0	1.0	0.0	0.0	30.3	35.7
LnGrp LOS				D		F	D	A			C	D
Approach Vol, veh/h					643		2275				1637	
Approach Delay, s/veh					132.3		14.5				31.7	
Approach LOS					F		B				C	
Timer - Assigned Phs	1	2					6	8				
Phs Duration (G+Y+Rc), s	37.2	82.8					120.0	40.0				
Change Period (Y+Rc), s	7.9	7.5					7.5	7.0				
Max Green Setting (Gmax), s	45.1	59.5					112.5	33.0				
Max Q Clear Time (g_c+I1), s	27.3	36.6					2.0	35.0				
Green Ext Time (p_c), s	1.9	14.1					22.6	0.0				
Intersection Summary												
HCM 7th Control Delay, s/veh	37.3											
HCM 7th LOS	D											

Synchro 12 Report

Lanes, Volumes, Timings

2-2027 NO BUILD AM PEAK HOUR

11: N. Courtenay Pkwy & Proposed Dwy 1

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (vph)	0	0	1335	0	0	1808
Future Volume (vph)	0	0	1335	0	0	1808
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1451	0	0	1965
Sign Control	Stop		Free			Free
Intersection Summary						
Control Type: Unsignalized						
Intersection Capacity Utilization 53.3%				ICU Level of Service A		
Analysis Period (min) 15						

HCM 7th TWSC
11: N. Courtenay Pkwy & Proposed Dwy 1

2-2027 NO BUILD AM PEAK HOUR

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↗↗			↗↗
Traffic Vol, veh/h	0	0	1335	0	0	1808
Future Vol, veh/h	0	0	1335	0	0	1808
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	0	0	1451	0	0	1965
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	726	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	*716	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		0	-	-	-	-
Mov Cap-1 Maneuver	-	*716	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB		SB		
HCM Ctrl Dly, s/v	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT			
Capacity (veh/h)	-	-	-	-		
HCM Lane V/C Ratio	-	-	-	-		
HCM Ctrl Dly (s/v)	-	-	0	-		
HCM Lane LOS	-	-	A	-		
HCM 95th %tile Q(veh)	-	-	-	-		
Notes						
-: Volume exceeds capacity		\$: Delay exceeds 300s				
+: Computation Not Defined		*: All major volume in platoon				

Synchro 12 Report

Lanes, Volumes, Timings
12: Pioneer Rd & Proposed Dwy2

2-2027 NO BUILD AM PEAK HOUR

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Intersection Summary						
Control Type: Unsignalized						
Intersection Capacity Utilization 0.0%				ICU Level of Service A		
Analysis Period (min) 15						

HCM 7th TWSC
12: Pioneer Rd & Proposed Dwy2

2-2027 NO BUILD AM PEAK HOUR

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	0	0	0	0	0	0
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1	0	-	0	1	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	0	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1622	-	-	-	1022	1083
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1622	-	-	-	1022	1083
Mov Cap-2 Maneuver	-	-	-	-	1022	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	0	0		0		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1622	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Ctrl Dly (s/v)	0	-	-	-	0	
HCM Lane LOS	A	-	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Synchro 12 Report

Lanes, Volumes, Timings
13: Pioneer Rd & Shared Driveway

2-2027 NO BUILD AM PEAK HOUR

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	306	67	13	377	2	41	1	12	2	0	1
Future Volume (vph)	4	306	67	13	377	2	41	1	12	2	0	1
Confl. Peds. (#/hr)	6		3	3		6						
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
Heavy Vehicles (%)	2%	2%	2%	2%	4%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	410	0	0	426	0	0	59	0	0	3	0
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Control Type: Unsignalized												
Intersection Capacity Utilization 38.4% ICU Level of Service A												
Analysis Period (min) 15												

HCM 7th TWSC
13: Pioneer Rd & Shared Driveway

2-2027 NO BUILD AM PEAK HOUR

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	4	306	67	13	377	2	41	1	12	2	0	1
Future Vol, veh/h	4	306	67	13	377	2	41	1	12	2	0	1
Conflicting Peds, #/hr	6	0	3	3	0	6	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	4	2	2	2	2	2	2	2
Mvmt Flow	4	333	73	14	410	2	45	1	13	2	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	418	0	0	408	0	0	819	827	372	787	862	417
Stage 1	-	-	-	-	-	-	381	381	-	445	445	-
Stage 2	-	-	-	-	-	-	438	446	-	342	417	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1141	-	-	1150	-	-	294	307	674	309	293	636
Stage 1	-	-	-	-	-	-	642	613	-	592	575	-
Stage 2	-	-	-	-	-	-	597	574	-	673	591	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1135	-	-	1147	-	-	287	298	672	294	284	632
Mov Cap-2 Maneuver	-	-	-	-	-	-	287	298	-	294	284	-
Stage 1	-	-	-	-	-	-	636	609	-	579	562	-
Stage 2	-	-	-	-	-	-	587	561	-	656	587	-

Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.09			0.27			18.3			15.15		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	329	18	-	-	60	-	-	358
HCM Lane V/C Ratio	0.178	0.004	-	-	0.012	-	-	0.009
HCM Ctrl Dly (s/v)	18.3	8.2	0	-	8.2	0	-	15.1
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0

Synchro 12 Report

NO BUILD DS

Lanes, Volumes, Timings
1: N. Courtenay Pkwy & Pioneer Rd

2-2027 NO BUILD DS PEAK HOUR

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	21	41	135	23	121	52	1552	85	110	1644	36
Future Volume (vph)	133	21	41	135	23	121	52	1552	85	110	1644	36
Confl. Peds. (#/hr)			4	4			2		1	1		2
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	6%	3%	2%	5%	4%	5%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	210	0	0	170	130	56	1669	91	118	1807	0
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4	6		6	2		
Detector Phase	8	8		4	4	4	1	6	6	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	5.0	15.0	15.0	5.0	15.0	
Minimum Split (s)	41.7	41.7		40.7	40.7	40.7	12.8	30.8	30.8	12.8	32.8	
Total Split (s)	42.0	42.0		42.0	42.0	42.0	18.0	108.0	108.0	20.0	110.0	
Total Split (%)	24.7%	24.7%		24.7%	24.7%	24.7%	10.6%	63.5%	63.5%	11.8%	64.7%	
Maximum Green (s)	35.3	35.3		35.3	35.3	35.3	10.2	101.2	101.2	12.2	103.2	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	4.8	4.8	4.8	4.8	4.8	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	2.0	2.0	3.0	2.0	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.7			6.7	6.7	7.8	6.8	6.8	7.8	6.8	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.5	3.5		3.5	3.5	3.5	3.0	3.5	3.5	3.0	3.5	
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0	7.0		7.0	
Flash Don't Walk (s)	28.0	28.0		27.0	27.0	27.0		17.0	17.0		19.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0	0		0	
Act Effct Green (s)		35.3			35.3	35.3	110.0	103.4	103.4	116.1	108.5	
Actuated g/C Ratio		0.21			0.21	0.21	0.65	0.61	0.61	0.68	0.64	
v/c Ratio		1.07			0.69	0.32	0.43	0.80	0.10	0.69	0.83	
Control Delay (s/veh)		143.3			78.4	12.3	23.3	29.6	4.3	42.6	29.0	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay (s/veh)		143.3			78.4	12.3	23.3	29.6	4.3	42.6	29.0	
LOS		F			E	B	C	C	A	D	C	
Approach Delay (s/veh)		143.3			49.8			28.2			29.9	
Approach LOS		F			D			C			C	
Queue Length 50th (ft)		~252			178	7	18	725	7	45	811	
Queue Length 95th (ft)		#434			272	68	47	852	34	121	972	
Internal Link Dist (ft)		649			211			778			658	
Turn Bay Length (ft)						125	150		105	245		
Base Capacity (vph)		196			245	408	155	2080	937	193	2176	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		1.07			0.69	0.32	0.36	0.80	0.10	0.61	0.83	

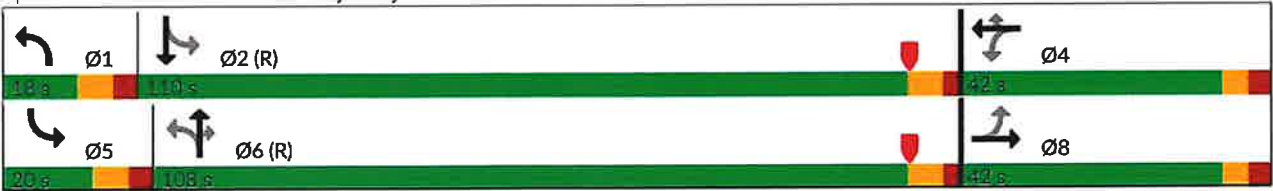
Synchro 12 Report

Lanes, Volumes, Timings
1: N. Courtenay Pkwy & Pioneer Rd

2-2027 NO BUILD DS PEAK HOUR

Intersection Summary	
Cycle Length: 170	
Actuated Cycle Length: 170	
Offset: 105 (62%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow	
Natural Cycle: 130	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.07	
Intersection Signal Delay (s/veh): 36.1	Intersection LOS: D
Intersection Capacity Utilization 87.7%	ICU Level of Service E
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 1: N. Courtenay Pkwy & Pioneer Rd



HCM 7th Signalized Intersection Summary
1: N. Courtenay Pkwy & Pioneer Rd

2-2027 NO BUILD DS PEAK HOUR

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↕	↔	↔	↕	↕
Traffic Volume (veh/h)	133	21	41	135	23	121	52	1552	85	110	1644	36
Future Volume (veh/h)	133	21	41	135	23	121	52	1552	85	110	1644	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1811	1856	1870	1826	1841	1826	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	143	23	39	145	25	79	56	1669	61	118	1768	38
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	6	3	2	5	4	5	2	2	2	2	2
Cap, veh/h	204	27	46	213	30	236	265	2449	1091	217	2470	53
Arrive On Green	0.15	0.15	0.15	0.15	0.15	0.15	0.03	0.69	0.69	0.07	1.00	1.00
Sat Flow, veh/h	1098	177	299	1139	196	1548	1739	3554	1583	1781	3555	76
Grp Volume(v), veh/h	205	0	0	170	0	79	56	1669	61	118	881	925
Grp Sat Flow(s),veh/h/ln	1574	0	0	1335	0	1548	1739	1777	1583	1781	1777	1855
Q Serve(g_s), s	0.0	0.0	0.0	0.1	0.0	7.7	1.6	46.8	2.1	3.5	0.0	0.0
Cycle Q Clear(g_c), s	21.0	0.0	0.0	21.1	0.0	7.7	1.6	46.8	2.1	3.5	0.0	0.0
Prop In Lane	0.70		0.19	0.85		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	276	0	0	243	0	236	265	2449	1091	217	1234	1288
V/C Ratio(X)	0.74	0.00	0.00	0.70	0.00	0.33	0.21	0.68	0.06	0.54	0.71	0.72
Avail Cap(c_a), veh/h	354	0	0	318	0	321	322	2449	1091	286	1234	1288
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	69.9	0.0	0.0	70.0	0.0	64.3	7.1	15.5	8.5	17.3	0.0	0.0
Incr Delay (d2), s/veh	6.7	0.0	0.0	5.2	0.0	1.0	0.4	1.6	0.1	2.1	3.5	3.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	14.2	0.0	0.0	12.1	0.0	5.7	1.1	25.0	1.3	3.5	2.2	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	76.6	0.0	0.0	75.2	0.0	65.3	7.5	17.0	8.6	19.4	3.5	3.5
LnGrp LOS	E			E		E	A	B	A	B	A	A
Approach Vol, veh/h		205			249			1786			1924	
Approach Delay, s/veh		76.6			72.0			16.5			4.5	
Approach LOS		E			E			B			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.4	124.9		32.7	13.4	124.0		32.7				
Change Period (Y+Rc), s	7.8	6.8		6.7	7.8	6.8		6.7				
Max Green Setting (Gmax), s	10.2	103.2		35.3	12.2	101.2		35.3				
Max Q Clear Time (g_c+I1), s	3.6	2.0		23.1	5.5	48.8		23.0				
Green Ext Time (p_c), s	0.0	32.3		1.1	0.1	24.2		1.0				
Intersection Summary												
HCM 7th Control Delay, s/veh			17.2									
HCM 7th LOS			B									

Synchro 12 Report

Lanes, Volumes, Timings

2-2027 NO BUILD DS PEAK HOUR

2: N. Courtenay Pkwy & S.R. 528 EB on-off Ramps

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	6%	2%	2%	2%	2%	2%	2%	2%	2%	7%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type	Prot		Prot						Perm	Prot		
Protected Phases	7		7					6		5	2	
Permitted Phases									6			
Detector Phase	7		7					6	6	5	2	
Switch Phase												
Minimum Initial (s)	5.0		5.0					12.0	12.0	5.0	12.0	
Minimum Split (s)	9.5		9.5					25.4	25.4	25.8	25.4	
Total Split (s)	40.0		40.0					85.0	85.0	45.0	130.0	
Total Split (%)	23.5%		23.5%					50.0%	50.0%	26.5%	76.5%	
Maximum Green (s)	35.5		35.5					77.6	77.6	37.2	122.6	
Yellow Time (s)	3.5		3.5					4.8	4.8	4.8	4.8	
All-Red Time (s)	1.0		1.0					2.6	2.6	3.0	2.6	
Lost Time Adjust (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5		4.5					7.4	7.4	7.8	7.4	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0		3.0					4.0	4.0	4.0	4.0	
Recall Mode	None		None					C-Max	C-Max	None	C-Max	
Act Effct Green (s)												
Actuated g/C Ratio												
v/c Ratio												
Control Delay (s/veh)												
Queue Delay												
Total Delay (s/veh)												
LOS												
Approach Delay (s/veh)												
Approach LOS												
Queue Length 50th (ft)												
Queue Length 95th (ft)												
Internal Link Dist (ft)		674			677			1602			365	
Turn Bay Length (ft)												
Base Capacity (vph)												
Starvation Cap Reductn												
Spillback Cap Reductn												
Storage Cap Reductn												
Reduced v/c Ratio												
Intersection Summary												
Cycle Length: 170												
Actuated Cycle Length: 170												
Offset: 99 (58%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow												
Natural Cycle: 65												

Synchro 12 Report

Lanes, Volumes, Timings

2-2027 NO BUILD DS PEAK HOUR

2: N. Courtenay Pkwy & S.R. 528 EB on-off Ramps

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.00

Intersection Signal Delay (s/veh): 0.0

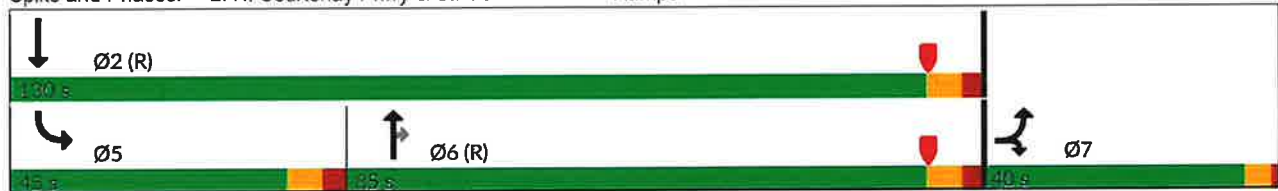
Intersection LOS: A

Intersection Capacity Utilization 38.7%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 2: N. Courtenay Pkwy & S.R. 528 EB on-off Ramps



HCM 7th Signalized Intersection Summary
2: N. Courtenay Pkwy & S.R. 528 EB on-off Ramps

2-2027 NO BUILD DS PEAK HOUR

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	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
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1811	0	1870				0	1870	1870	1796	1870	0
Adj Flow Rate, veh/h	0	0	0				0	0	0	0	0	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	6	0	2				0	2	2	7	2	0
Cap, veh/h	2	0					0	4884		1	3399	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	3346	0	2790				0	5274	1585	1711	3647	0
Grp Volume(v), veh/h	0	0	0				0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1673	0	1395				0	1702	1585	1711	1777	0
Q Serve(g_s), s	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	2	0					0	4884		1	3399	0
V/C Ratio(X)	0.00	0.00					0.00	0.00		0.00	0.00	0.00
Avail Cap(c_a), veh/h	699	0					0	4884		374	3399	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00				0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS												
Approach Vol, veh/h	0						0			0		
Approach Delay, s/veh	0.0						0.0			0.0		
Approach LOS												
Timer - Assigned Phs	2			4			5			6		
Phs Duration (G+Y+Rc), s	170.0			0.0			0.0			170.0		
Change Period (Y+Rc), s	7.4			4.5			7.8			7.4		
Max Green Setting (Gmax), s	122.6			35.5			37.2			77.6		
Max Q Clear Time (g_c+I1), s	0.0			0.0			0.0			0.0		
Green Ext Time (p_c), s	0.0			0.0			0.0			0.0		
Intersection Summary												
HCM 7th Control Delay, s/veh	0.0											
HCM 7th LOS	A											
Notes												
Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.												

Synchro 12 Report

Lanes, Volumes, Timings

2-2027 NO BUILD DS PEAK HOUR

3: N. Courtenay Pkwy & S.R. 528 WB on-off Ramps

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔↔		↗	↖↖	↗↗			↗↗↗	↗
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Confl. Peds. (#/hr)						1						
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	2%	2%	2%	4%	3%	4%	2%	2%	4%	10%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type				Prot		Perm	Prot					Perm
Protected Phases				3			1	6			2	
Permitted Phases						3						2
Detector Phase				3		3	1	6			2	2
Switch Phase												
Minimum Initial (s)				7.0		7.0	5.0	12.0			12.0	12.0
Minimum Split (s)				14.0		14.0	22.5	22.5			22.5	22.5
Total Split (s)				30.0		30.0	52.0	140.0			88.0	88.0
Total Split (%)				17.6%		17.6%	30.6%	82.4%			51.8%	51.8%
Maximum Green (s)				23.0		23.0	44.1	132.5			80.5	80.5
Yellow Time (s)				4.0		4.0	4.8	5.3			5.3	5.3
All-Red Time (s)				3.0		3.0	3.1	2.2			2.2	2.2
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				7.0		7.0	7.9	7.5			7.5	7.5
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0		3.0	3.0	3.0			4.0	4.0
Recall Mode				None		None	Min	C-Max			C-Max	C-Max
Act Effct Green (s)												
Actuated g/C Ratio												
v/c Ratio												
Control Delay (s/veh)												
Queue Delay												
Total Delay (s/veh)												
LOS												
Approach Delay (s/veh)												
Approach LOS												
Queue Length 50th (ft)												
Queue Length 95th (ft)												
Internal Link Dist (ft)		690			789			365			641	
Turn Bay Length (ft)												
Base Capacity (vph)												
Starvation Cap Reductn												
Spillback Cap Reductn												
Storage Cap Reductn												
Reduced v/c Ratio												
Intersection Summary												
Cycle Length: 170												
Actuated Cycle Length: 170												

Synchro 12 Report

Lanes, Volumes, Timings

2-2027 NO BUILD DS PEAK HOUR

3: N. Courtenay Pkwy & S.R. 528 WB on-off Ramps

Offset: 62 (36%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.00

Intersection Signal Delay (s/veh): 0.0

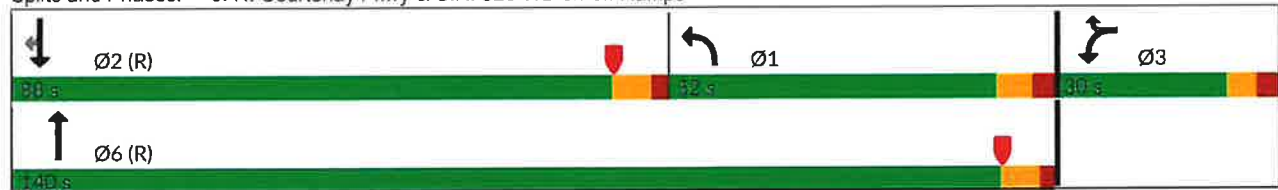
Intersection LOS: A

Intersection Capacity Utilization 38.7%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: N. Courtenay Pkwy & S.R. 528 WB on-off Ramps



HCM 7th Signalized Intersection Summary
3: N. Courtenay Pkwy & S.R. 528 WB on-off Ramps

2-2027 NO BUILD DS PEAK HOUR

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Lane Width Adj.				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)				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
Work Zone On Approach				No				No				No
Adj Sat Flow, veh/h/ln				1870	0	1841	1856	1841	0	0	1841	1752
Adj Flow Rate, veh/h				0	0	0	0	0	0	0	0	0
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				2	0	4	3	4	0	0	4	10
Cap, veh/h				2	0	1	1494	3335	0	0	2380	703
Arrive On Green				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h				3456	0	1560	3428	3589	0	0	5191	1485
Grp Volume(v), veh/h				0	0	0	0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln				1728	0	1560	1714	1749	0	0	1675	1485
Q Serve(g_s), s				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				2	0	1	1494	3335	0	0	2380	703
V/C Ratio(X)				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h				468	0	211	1494	3335	0	0	2380	703
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS												
Approach Vol, veh/h				0				0				0
Approach Delay, s/veh				0.0				0.0				0.0
Approach LOS												
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	82.0	88.0				170.0		0.0				
Change Period (Y+Rc), s	7.9	7.5				* 7.9		7.0				
Max Green Setting (Gmax), s	44.1	80.5				* 1.3E+02		23.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0				0.0		0.0				
Green Ext Time (p_c), s	0.0	0.0				0.0		0.0				
Intersection Summary												
HCM 7th Control Delay, s/veh				0.0								
HCM 7th LOS				A								
Notes												
* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.												

Synchro 12 Report

Lanes, Volumes, Timings

2-2027 NO BUILD DS PEAK HOUR

11: N. Courtenay Pkwy & Proposed Dwy 1

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Sign Control	Stop		Free			Free
Intersection Summary						
Control Type: Unsignalized						
Intersection Capacity Utilization 0.0%			ICU Level of Service A			
Analysis Period (min) 15						

HCM 7th TWSC
11: N. Courtenay Pkwy & Proposed Dwy 1

2-2027 NO BUILD DS PEAK HOUR

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↗↘			↗↘
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0
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	0	0	0	0	0	0
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	-	0	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	-	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB	SB			
HCM Ctrl Dly, s/v	0	0	0			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT			
Capacity (veh/h)	-	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Ctrl Dly (s/v)	-	-	0	-	-	-
HCM Lane LOS	-	-	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-	-	-

Lanes, Volumes, Timings
12: Pioneer Rd & Proposed Dwy2

2-2027 NO BUILD DS PEAK HOUR

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Intersection Summary						
Control Type: Unsignalized						
Intersection Capacity Utilization 0.0%				ICU Level of Service A		
Analysis Period (min) 15						

HCM 7th TWSC
12: Pioneer Rd & Proposed Dwy2

2-2027 NO BUILD DS PEAK HOUR

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0
Conflicting Peds. #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	0	0	0	0	0	0
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1	0	-	0	1	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	0	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1622	-	-	-	1022	1083
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1622	-	-	-	1022	1083
Mov Cap-2 Maneuver	-	-	-	-	1022	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	0	0		0		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1622	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Ctrl Dly (s/v)	0	-	-	-	0	
HCM Lane LOS	A	-	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Synchro 12 Report

Lanes, Volumes, Timings
13: Pioneer Rd & Shared Driveway

2-2027 NO BUILD DS PEAK HOUR

16: Pioneer Rd and Shared Driveway												
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	138	37	3	155	1	64	0	8	2	0	9
Future Volume (vph)	3	138	37	3	155	1	64	0	8	2	0	9
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	4%	100%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	197	0	0	176	0	0	80	0	0	12	0
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Control Type: Unsignalized												
Intersection Capacity Utilization 28.5%						ICU Level of Service A						
Analysis Period (min) 15												

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	3	138	37	3	155	1	64	0	8	2	0	9
Future Vol, veh/h	3	138	37	3	155	1	64	0	8	2	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	4	100	2	2	2	2	2	2
Mvmt Flow	3	153	41	3	172	1	71	0	9	2	0	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	173	0	0	194	0	0	359	361	174	339	381	173
Stage 1	-	-	-	-	-	-	181	181	-	179	179	-
Stage 2	-	-	-	-	-	-	179	180	-	160	201	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1403	-	-	1379	-	-	596	566	870	614	552	871
Stage 1	-	-	-	-	-	-	821	750	-	822	751	-
Stage 2	-	-	-	-	-	-	823	750	-	842	735	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1403	-	-	1379	-	-	586	563	870	605	549	871
Mov Cap-2 Maneuver	-	-	-	-	-	-	586	563	-	605	549	-
Stage 1	-	-	-	-	-	-	819	748	-	820	749	-
Stage 2	-	-	-	-	-	-	811	748	-	831	733	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.13	0.14	11.81	9.53
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	608	29	-	-	34	-	-	806
HCM Lane V/C Ratio	0.132	0.002	-	-	0.002	-	-	0.015
HCM Ctrl Dly (s/v)	11.8	7.6	0	-	7.6	0	-	9.5
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	0

NO BUILD PM

Lanes, Volumes, Timings
1: N. Courtenay Pkwy & Pioneer Rd

2-2027 NO BUILD PM PEAK HOUR

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	122	22	33	120	21	111	43	1566	110	117	1688	36
Future Volume (vph)	122	22	33	120	21	111	43	1566	110	117	1688	36
Confl. Peds. (#/hr)	2						2	2		3	3	2
Confl. Bikes (#/hr)												2
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	6%	2%	4%	2%	2%	6%	11%	2%	2%	2%	2%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	180	0	0	143	113	44	1598	112	119	1759	0
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4	6		6	2		
Detector Phase	8	8		4	4	4	1	6	6	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	5.0	15.0	15.0	5.0	15.0	
Minimum Split (s)	41.7	41.7		40.7	40.7	40.7	12.8	30.8	30.8	12.8	32.8	
Total Split (s)	42.0	42.0		42.0	42.0	42.0	18.0	108.0	108.0	20.0	110.0	
Total Split (%)	24.7%	24.7%		24.7%	24.7%	24.7%	10.6%	63.5%	63.5%	11.8%	64.7%	
Maximum Green (s)	35.3	35.3		35.3	35.3	35.3	10.2	101.2	101.2	12.2	103.2	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	4.8	4.8	4.8	4.8	4.8	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	2.0	2.0	3.0	2.0	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.7			6.7	6.7	7.8	6.8	6.8	7.8	6.8	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.5	3.5		3.5	3.5	3.5	3.0	3.5	3.5	3.0	3.5	
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0	7.0		7.0	
Flash Don't Walk (s)	28.0	28.0		27.0	27.0	27.0		17.0	17.0		19.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0	0		0	
Act Effct Green (s)		32.6			32.6	32.6	112.5	106.5	106.5	119.0	111.8	
Actuated g/C Ratio		0.19			0.19	0.19	0.66	0.63	0.63	0.70	0.66	
v/c Ratio		0.94			0.62	0.31	0.33	0.75	0.12	0.62	0.79	
Control Delay (s/veh)		114.8			74.5	10.9	14.9	25.9	5.7	28.9	13.6	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay (s/veh)		114.8			74.5	10.9	14.9	25.9	5.7	28.9	13.6	
LOS		F			E	B	B	C	A	C	B	
Approach Delay (s/veh)		114.8			46.4			24.4			14.6	
Approach LOS		F			D			C			B	
Queue Length 50th (ft)		190			145	0	14	655	16	21	908	
Queue Length 95th (ft)		#342			228	57	27	785	46	m51	m690	
Internal Link Dist (ft)		649			211			778			658	
Turn Bay Length (ft)						125	150		105	245		
Base Capacity (vph)		207			251	390	163	2142	957	217	2240	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		0.87			0.57	0.29	0.27	0.75	0.12	0.55	0.79	

Synchro 12 Report

Lanes, Volumes, Timings
1: N. Courtenay Pkwy & Pioneer Rd

2-2027 NO BUILD PM PEAK HOUR

Intersection Summary

Cycle Length: 170

Actuated Cycle Length: 170

Offset: 105 (62%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay (s/veh): 25.3

Intersection LOS: C

Intersection Capacity Utilization 86.3%

ICU Level of Service E

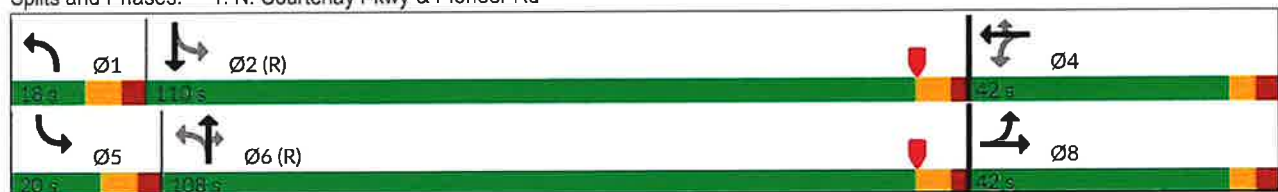
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: N. Courtenay Pkwy & Pioneer Rd



HCM 7th Signalized Intersection Summary
1: N. Courtenay Pkwy & Pioneer Rd

2-2027 NO BUILD PM PEAK HOUR

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↕	↔	↔	↕	
Traffic Volume (veh/h)	122	22	33	120	21	111	43	1566	110	117	1688	36
Future Volume (veh/h)	122	22	33	120	21	111	43	1566	110	117	1688	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1870	1841	1870	1870	1811	1737	1870	1870	1870	1870	1856
Adj Flow Rate, veh/h	124	22	29	122	21	69	44	1598	83	119	1722	36
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	6	2	4	2	2	6	11	2	2	2	2	3
Cap, veh/h	183	26	34	191	26	196	266	2542	1131	240	2565	53
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.03	0.72	0.72	0.06	1.00	1.00
Sat Flow, veh/h	1148	204	269	1185	204	1528	1654	3554	1582	1781	3558	74
Grp Volume(v), veh/h	175	0	0	143	0	69	44	1598	83	119	858	900
Grp Sat Flow(s),veh/h/ln	1621	0	0	1389	0	1528	1654	1777	1582	1781	1777	1855
Q Serve(g_s), s	0.4	0.0	0.0	0.0	0.0	7.0	1.2	39.6	2.7	3.2	0.0	0.0
Cycle Q Clear(g_c), s	17.5	0.0	0.0	17.1	0.0	7.0	1.2	39.6	2.7	3.2	0.0	0.0
Prop In Lane	0.71		0.17	0.85		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	244	0	0	217	0	196	266	2542	1131	240	1281	1337
V/C Ratio(X)	0.72	0.00	0.00	0.66	0.00	0.35	0.17	0.63	0.07	0.50	0.67	0.67
Avail Cap(c_a), veh/h	360	0	0	329	0	317	323	2542	1131	312	1281	1337
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	72.2	0.0	0.0	72.1	0.0	67.7	5.9	12.5	7.3	13.0	0.0	0.0
Incr Delay (d2), s/veh	4.7	0.0	0.0	4.1	0.0	1.3	0.3	1.2	0.1	1.6	2.8	2.7
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	12.4	0.0	0.0	10.5	0.0	5.1	0.7	21.1	1.6	2.7	1.8	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	76.9	0.0	0.0	76.1	0.0	69.0	6.1	13.7	7.4	14.6	2.8	2.7
LnGrp LOS	E			E		E	A	B	A	B	A	A
Approach Vol, veh/h		175			212			1725			1877	
Approach Delay, s/veh		76.9			73.8			13.2			3.5	
Approach LOS		E			E			B			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.2	129.4		28.5	13.1	128.4		28.5				
Change Period (Y+Rc), s	7.8	6.8		6.7	7.8	6.8		6.7				
Max Green Setting (Gmax), s	10.2	103.2		35.3	12.2	101.2		35.3				
Max Q Clear Time (g_c+I1), s	3.2	2.0		19.1	5.2	41.6		19.5				
Green Ext Time (p_c), s	0.0	30.0		1.1	0.1	23.8		1.0				
Intersection Summary												
HCM 7th Control Delay, s/veh			14.7									
HCM 7th LOS			B									

Synchro 12 Report

Lanes, Volumes, Timings

2-2027 NO BUILD PM PEAK HOUR

2: N. Courtenay Pkwy & S.R. 528 EB on-off Ramps

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	472	0	786	0	0	0	0	1407	309	396	1300	0
Future Volume (vph)	472	0	786	0	0	0	0	1407	309	396	1300	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	487	0	810	0	0	0	0	1451	319	408	1340	0
Turn Type	Prot		Prot					NA	Perm	Prot	NA	
Protected Phases	7		7					6		5	2	
Permitted Phases									6			
Detector Phase	7		7					6	6	5	2	
Switch Phase												
Minimum Initial (s)	5.0		5.0					12.0	12.0	5.0	12.0	
Minimum Split (s)	9.5		9.5					25.4	25.4	25.8	25.4	
Total Split (s)	40.0		40.0					85.0	85.0	45.0	130.0	
Total Split (%)	23.5%		23.5%					50.0%	50.0%	26.5%	76.5%	
Maximum Green (s)	35.5		35.5					77.6	77.6	37.2	122.6	
Yellow Time (s)	3.5		3.5					4.8	4.8	4.8	4.8	
All-Red Time (s)	1.0		1.0					2.6	2.6	3.0	2.6	
Lost Time Adjust (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5		4.5					7.4	7.4	7.8	7.4	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0		3.0					4.0	4.0	4.0	4.0	
Recall Mode	None		None					C-Max	C-Max	None	C-Max	
Act Effct Green (s)	35.5		35.5					77.6	77.6	37.2	122.6	
Actuated g/C Ratio	0.21		0.21					0.46	0.46	0.22	0.72	
v/c Ratio	0.69		1.14					0.65	0.37	1.13	0.56	
Control Delay (s/veh)	67.8		125.7					26.8	3.4	130.9	6.3	
Queue Delay	0.0		0.0					0.8	0.0	0.6	0.6	
Total Delay (s/veh)	67.8		125.7					27.6	3.4	131.5	6.9	
LOS	E		F					C	A	F	A	
Approach Delay (s/veh)		103.9						23.3			36.0	
Approach LOS		F						C			D	
Queue Length 50th (ft)	261		~510					212	0	~508	166	
Queue Length 95th (ft)	327		#660					296	m#58	m#730	181	
Internal Link Dist (ft)		674			677			1602			365	
Turn Bay Length (ft)	385		385						725			
Base Capacity (vph)	710		710					2244	872	361	2382	
Starvation Cap Reductn	0		0					0	0	21	589	
Spillback Cap Reductn	0		0					445	0	0	0	
Storage Cap Reductn	0		0					0	0	0	0	
Reduced v/c Ratio	0.69		1.14					0.81	0.37	1.20	0.75	
Intersection Summary												
Cycle Length: 170												
Actuated Cycle Length: 170												
Offset: 99 (58%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow												
Natural Cycle: 110												

Synchro 12 Report

Lanes, Volumes, Timings

2-2027 NO BUILD PM PEAK HOUR

2: N. Courtenay Pkwy & S.R. 528 EB on-off Ramps

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.14

Intersection Signal Delay (s/veh): 49.6

Intersection LOS: D

Intersection Capacity Utilization 120.7%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

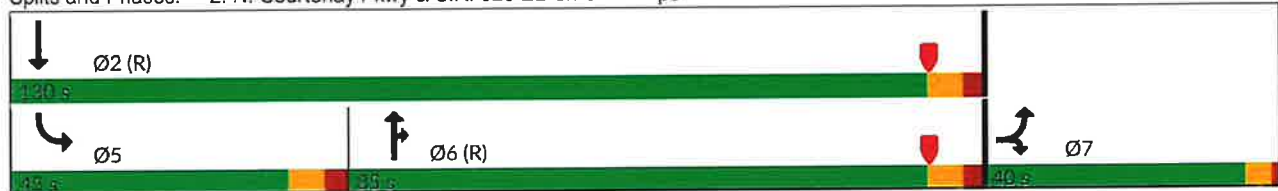
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: N. Courtenay Pkwy & S.R. 528 EB on-off Ramps



HCM 7th Signalized Intersection Summary
2: N. Courtenay Pkwy & S.R. 528 EB on-off Ramps

2-2027 NO BUILD PM PEAK HOUR

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	472	0	786	0	0	0	0	1407	309	396	1300	0
Future Volume (veh/h)	472	0	786	0	0	0	0	1407	309	396	1300	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	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
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1856	0	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	487	0	0				0	1451	0	408	1340	0
Peak Hour Factor	0.97	0.97	0.97				0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	0	2				0	2	2	2	2	0
Cap, veh/h	545	0					0	2585		390	2740	0
Arrive On Green	0.16	0.00	0.00				0.00	1.00	0.00	0.44	1.00	0.00
Sat Flow, veh/h	3428	0	2790				0	5274	1585	1781	3647	0
Grp Volume(v), veh/h	487	0	0				0	1451	0	408	1340	0
Grp Sat Flow(s),veh/h/ln	1714	0	1395				0	1702	1585	1781	1777	0
Q Serve(g_s), s	23.7	0.0	0.0				0.0	0.0	0.0	37.2	0.0	0.0
Cycle Q Clear(g_c), s	23.7	0.0	0.0				0.0	0.0	0.0	37.2	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	545	0					0	2585		390	2740	0
V/C Ratio(X)	0.89	0.00					0.00	0.56		1.05	0.49	0.00
Avail Cap(c_a), veh/h	716	0					0	2585		390	2740	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	2.00	2.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	0.00	0.68	0.68	0.00
Uniform Delay (d), s/veh	70.1	0.0	0.0				0.0	0.0	0.0	47.8	0.0	0.0
Incr Delay (d2), s/veh	11.2	0.0	0.0				0.0	0.9	0.0	50.4	0.4	0.0
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	16.9	0.0	0.0				0.0	0.4	0.0	25.5	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	81.3	0.0	0.0				0.0	0.9	0.0	98.2	0.4	0.0
LnGrp LOS	F							A		F	A	
Approach Vol, veh/h		487						1451			1748	
Approach Delay, s/veh		81.3						0.9			23.2	
Approach LOS		F						A			C	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		138.5		31.5	45.0	93.5						
Change Period (Y+Rc), s		7.4		4.5	7.8	7.4						
Max Green Setting (Gmax), s		122.6		35.5	37.2	77.6						
Max Q Clear Time (g_c+I1), s		2.0		25.7	39.2	2.0						
Green Ext Time (p_c), s		22.6		1.4	0.0	23.2						

Intersection Summary

HCM 7th Control Delay, s/veh	22.1
HCM 7th LOS	C

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lanes, Volumes, Timings
3: N. Courtenay Pkwy & S.R. 528 WB on-off Ramps

2-2027 NO BUILD PM PEAK HOUR

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰↱		↰	↰↱	↱↱			↱↱↱	↰
Traffic Volume (vph)	0	0	0	364	0	324	751	1184	0	0	1456	1134
Future Volume (vph)	0	0	0	364	0	324	751	1184	0	0	1456	1134
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	4%	3%	3%	2%	2%	2%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	383	0	341	791	1246	0	0	1533	1194
Turn Type				Prot		Perm	Prot	NA			NA	Perm
Protected Phases				3			1	6			2	
Permitted Phases						3						2
Detector Phase				3		3	1	6			2	2
Switch Phase												
Minimum Initial (s)				7.0		7.0	5.0	12.0			12.0	12.0
Minimum Split (s)				14.0		14.0	22.5	22.5			22.5	22.5
Total Split (s)				30.0		30.0	52.0	140.0			88.0	88.0
Total Split (%)				17.6%		17.6%	30.6%	82.4%			51.8%	51.8%
Maximum Green (s)				23.0		23.0	44.1	132.5			80.5	80.5
Yellow Time (s)				4.0		4.0	4.8	5.3			5.3	5.3
All-Red Time (s)				3.0		3.0	3.1	2.2			2.2	2.2
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				7.0		7.0	7.9	7.5			7.5	7.5
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0		3.0	3.0	3.0			4.0	4.0
Recall Mode				None		None	Min	C-Max			C-Max	C-Max
Act Effct Green (s)				23.0		23.0	44.1	132.5			80.5	80.5
Actuated g/C Ratio				0.14		0.14	0.26	0.78			0.47	0.47
v/c Ratio				0.83		1.05	0.90	0.46			0.64	1.26
Control Delay (s/veh)				86.8		105.2	66.4	8.2			35.2	153.6
Queue Delay				2.2		0.0	47.7	0.3			0.1	0.0
Total Delay (s/veh)				89.0		105.2	114.1	8.5			35.3	153.6
LOS				F		F	F	A			D	F
Approach Delay (s/veh)					96.6			49.5			87.1	
Approach LOS					F			D			F	
Queue Length 50th (ft)				217		~278	471	188			466	~1431
Queue Length 95th (ft)				#292		#493	#561	207			517	#1702
Internal Link Dist (ft)		690			789			365			641	
Turn Bay Length (ft)				150		275						90
Base Capacity (vph)				464		324	882	2731			2407	945
Starvation Cap Reductn				0		0	207	711			0	0
Spillback Cap Reductn				24		0	0	0			134	0
Storage Cap Reductn				0		0	0	0			0	0
Reduced v/c Ratio				0.87		1.05	1.17	0.62			0.67	1.26
Intersection Summary												
Cycle Length: 170												
Actuated Cycle Length: 170												
Offset: 62 (36%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow												
Natural Cycle: 150												

Synchro 12 Report

3: N. Courtenay Pkwy & S.R. 528 WB on-off Ramps

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.26

Intersection Signal Delay (s/veh): 74.4

Intersection LOS: E

Intersection Capacity Utilization 120.7%

ICU Level of Service H

Analysis Period (min) 15

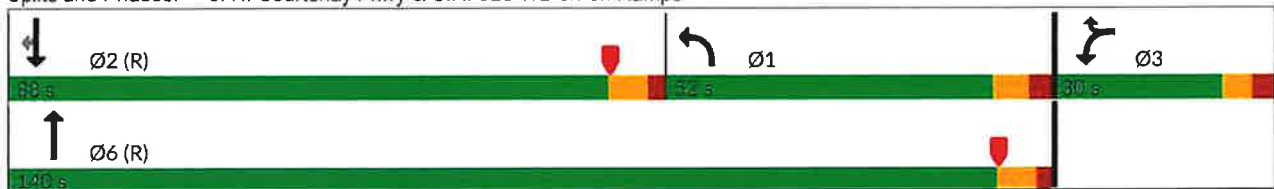
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 3: N. Courtenay Pkwy & S.R. 528 WB on-off Ramps



HCM 7th Signalized Intersection Summary
3: N. Courtenay Pkwy & S.R. 528 WB on-off Ramps

2-2027 NO BUILD PM PEAK HOUR

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔↔		↗	↗↗	↑↑			↑↑↑	↗
Traffic Volume (veh/h)	0	0	0	364	0	324	751	1184	0	0	1456	1134
Future Volume (veh/h)	0	0	0	364	0	324	751	1184	0	0	1456	1134
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Lane Width Adj.				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)				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
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1870	0	1841	1856	1856	0	0	1870	1856
Adj Flow Rate, veh/h				383	0	224	791	1246	0	0	1533	993
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	0	4	3	3	0	0	2	3
Cap, veh/h				468	0	211	1164	3022	0	0	2418	745
Arrive On Green				0.14	0.00	0.14	0.68	1.00	0.00	0.00	0.47	0.47
Sat Flow, veh/h				3456	0	1560	3428	3618	0	0	5274	1572
Grp Volume(v), veh/h				383	0	224	791	1246	0	0	1533	993
Grp Sat Flow(s),veh/h/ln				1728	0	1560	1714	1763	0	0	1702	1572
Q Serve(g_s), s				18.3	0.0	23.0	23.4	0.0	0.0	0.0	38.4	59.0
Cycle Q Clear(g_c), s				18.3	0.0	23.0	23.4	0.0	0.0	0.0	38.4	59.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				468	0	211	1164	3022	0	0	2418	745
V/C Ratio(X)				0.82	0.00	1.06	0.68	0.41	0.00	0.00	0.63	1.33
Avail Cap(c_a), veh/h				468	0	211	1164	3022	0	0	2418	745
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.71	0.71	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				71.5	0.0	73.5	21.8	0.0	0.0	0.0	33.7	24.0
Incr Delay (d2), s/veh				11.0	0.0	79.1	1.2	0.3	0.0	0.0	1.3	159.2
Initial Q Delay(d3), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				13.5	0.0	20.2	9.6	0.2	0.0	0.0	22.4	78.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh				82.5	0.0	152.6	22.9	0.3	0.0	0.0	34.9	183.3
LnGrp LOS				F		F	C	A			C	F
Approach Vol, veh/h					607			2037			2526	
Approach Delay, s/veh					108.4			9.1			93.2	
Approach LOS					F			A			F	
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	66.0	88.0				154.0		30.0				
Change Period (Y+Rc), s	7.9	7.5				* 7.9		7.0				
Max Green Setting (Gmax), s	44.1	80.5				* 1.3E+02		23.0				
Max Q Clear Time (g_c+I1), s	25.4	61.0				2.0		25.0				
Green Ext Time (p_c), s	2.8	17.1				11.8		0.0				
Intersection Summary												
HCM 7th Control Delay, s/veh				61.9								
HCM 7th LOS				E								
Notes												
* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.												

Synchro 12 Report

Lanes, Volumes, Timings

2-2027 NO BUILD PM PEAK HOUR

11: N. Courtenay Pkwy & Proposed Dwy 1

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	1783	0	0	1849
Future Volume (vph)	0	0	1783	0	0	1849
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1938	0	0	2010
Sign Control	Stop		Free			Free
Intersection Summary						
Control Type: Unsignalized						
Intersection Capacity Utilization 54.4%				ICU Level of Service A		
Analysis Period (min) 15						

HCM 7th TWSC
11: N. Courtenay Pkwy & Proposed Dwy 1

2-2027 NO BUILD PM PEAK HOUR

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↗↘			↗↘
Traffic Vol, veh/h	0	0	1783	0	0	1849
Future Vol, veh/h	0	0	1783	0	0	1849
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	0	0	1938	0	0	2010
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	-	969	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	*578	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %	-	0	-	-	-	-
Mov Cap-1 Maneuver	-	*578	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB	SB			
HCM Ctrl Dly, s/v	0	0	0			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT			
Capacity (veh/h)	-	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Ctrl Dly (s/v)	-	-	0	-	-	-
HCM Lane LOS	-	-	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-	-	-
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s				
+: Computation Not Defined		*: All major volume in platoon				

Synchro 12 Report

Lanes, Volumes, Timings
12: Pioneer Rd & Proposed Dwy2

2-2027 NO BUILD PM PEAK HOUR

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Intersection Summary						
Control Type: Unsignalized						
Intersection Capacity Utilization 0.0%				ICU Level of Service A		
Analysis Period (min) 15						

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	0	0	0	0	0	0
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1	0	-	0	1	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	0	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1622	-	-	-	1022	1083
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1622	-	-	-	1022	1083
Mov Cap-2 Maneuver	-	-	-	-	1022	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	0	0		0		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1622	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Ctrl Dly (s/v)	0	-	-	-	0	
HCM Lane LOS	A	-	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Lanes, Volumes, Timings
13: Pioneer Rd & Shared Driveway

2-2027 NO BUILD PM PEAK HOUR

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	144	37	1	133	0	0	65	3	0	0	8
Future Volume (vph)	4	144	37	1	133	0	0	65	3	0	0	8
Confl. Peds. (#/hr)	2					2	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	0.94	0.94	0.94
Heavy Vehicles (%)	50%	2%	3%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	196	0	0	142	0	0	72	0	0	9	0
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Control Type: Unsignalized												
Intersection Capacity Utilization 23.1% ICU Level of Service A												
Analysis Period (min) 15												

HCM 7th TWSC
13: Pioneer Rd & Shared Driveway

2-2027 NO BUILD PM PEAK HOUR

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	144	37	1	133	0	0	65	3	0	0	8
Future Vol, veh/h	4	144	37	1	133	0	0	65	3	0	0	8
Conflicting Peds, #/hr	2	0	0	0	0	2	1	0	1	1	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	50	2	3	2	3	2	2	2	2	2	2	2
Mvmt Flow	4	153	39	1	141	0	0	69	3	0	0	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	143	0	0	193	0	0	326	327	174	343	347	144
Stage 1	-	-	-	-	-	-	181	181	-	146	146	-
Stage 2	-	-	-	-	-	-	145	146	-	197	201	-
Critical Hdwy	4.6	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.65	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1192	-	-	1381	-	-	627	591	870	611	577	903
Stage 1	-	-	-	-	-	-	820	749	-	857	776	-
Stage 2	-	-	-	-	-	-	858	776	-	805	735	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1189	-	-	1381	-	-	618	587	869	533	573	900
Mov Cap-2 Maneuver	-	-	-	-	-	-	618	587	-	533	573	-
Stage 1	-	-	-	-	-	-	817	746	-	855	774	-
Stage 2	-	-	-	-	-	-	849	774	-	724	732	-

Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.17			0.06			11.87			9.04		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	596	37	-	-	13	-	-	900
HCM Lane V/C Ratio	0.121	0.004	-	-	0.001	-	-	0.009
HCM Ctrl Dly (s/v)	11.9	8	0	-	7.6	0	-	9
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0

Synchro 12 Report

**BUILD AM
ALTERNATIVE 0**

Lanes, Volumes, Timings
1: N. Courtenay Pkwy & Pioneer Rd

3-2027 BUILD AM PEAK HOUR

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	28	30	200	42	171	32	1102	90	221	1582	34
Future Volume (vph)	96	28	30	200	42	171	32	1102	90	221	1582	34
Confl. Peds. (#/hr)									1			
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
Heavy Vehicles (%)	3%	4%	2%	2%	6%	2%	25%	3%	2%	2%	3%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	169	0	0	266	188	35	1211	99	243	1775	0
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4	6		6	2		
Detector Phase	8	8		4	4	4	1	6	6	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	5.0	15.0	15.0	5.0	15.0	
Minimum Split (s)	41.7	41.7		40.7	40.7	40.7	12.8	30.8	30.8	12.8	32.8	
Total Split (s)	50.0	50.0		50.0	50.0	50.0	18.0	75.0	75.0	35.0	92.0	
Total Split (%)	31.3%	31.3%		31.3%	31.3%	31.3%	11.3%	46.9%	46.9%	21.9%	57.5%	
Maximum Green (s)	43.3	43.3		43.3	43.3	43.3	10.2	68.2	68.2	27.2	85.2	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	4.8	4.8	4.8	4.8	4.8	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	2.0	2.0	3.0	2.0	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.7			6.7	6.7	7.8	6.8	6.8	7.8	6.8	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.5	3.5		3.5	3.5	3.5	3.0	3.5	3.5	3.0	3.5	
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0	7.0		7.0	
Flash Don't Walk (s)	28.0	28.0		27.0	27.0	27.0		17.0	17.0		19.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0	0		0	
Act Effct Green (s)		39.6			39.6	39.6	85.0	78.9	78.9	105.9	94.6	
Actuated g/C Ratio		0.25			0.25	0.25	0.53	0.49	0.49	0.66	0.59	
v/c Ratio		0.93			0.92	0.39	0.36	0.73	0.12	0.76	0.89	
Control Delay (s/veh)		106.0			92.8	17.5	31.3	37.2	1.8	30.6	44.4	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay (s/veh)		106.0			92.8	17.5	31.3	37.2	1.8	30.6	44.4	
LOS		F			F	B	C	D	A	C	D	
Approach Delay (s/veh)		106.0			61.6			34.5			42.7	
Approach LOS		F			E			C			D	
Queue Length 50th (ft)		163			264	45	13	550	0	156	882	
Queue Length 95th (ft)		#307			#423	118	39	691	16	m189	m#1082	
Internal Link Dist (ft)		649			211			778			658	
Turn Bay Length (ft)						125	150		105	245		
Base Capacity (vph)		198			317	510	125	1669	803	388	1996	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		0.85			0.84	0.37	0.28	0.73	0.12	0.63	0.89	

Intersection Summary

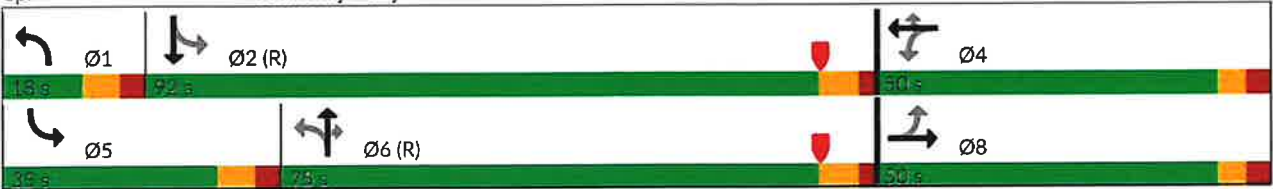
Synchro 12 Report

Lanes, Volumes, Timings
1: N. Courtenay Pkwy & Pioneer Rd

3-2027 BUILD AM PEAK HOUR

Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 135 (84%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow	
Natural Cycle: 130	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay (s/veh): 44.8	Intersection LOS: D
Intersection Capacity Utilization 84.4%	ICU Level of Service E
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 1: N. Courtenay Pkwy & Pioneer Rd



HCM 7th Signalized Intersection Summary
1: N. Courtenay Pkwy & Pioneer Rd

3-2027 BUILD AM PEAK HOUR

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↕	↔	↔	↕	
Traffic Volume (veh/h)	96	28	30	200	42	171	32	1102	90	221	1582	34
Future Volume (veh/h)	96	28	30	200	42	171	32	1102	90	221	1582	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	1.00		1.00	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
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1841	1870	1870	1811	1870	1530	1856	1870	1870	1856	1796
Adj Flow Rate, veh/h	105	31	28	220	46	136	35	1211	45	243	1738	36
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, %	3	4	2	2	6	2	25	3	2	2	3	7
Cap, veh/h	256	75	61	282	50	349	206	2016	906	332	2197	45
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.02	0.57	0.57	0.15	1.00	1.00
Sat Flow, veh/h	994	341	275	1095	229	1585	1457	3526	1584	1781	3532	73
Grp Volume(v), veh/h	164	0	0	266	0	136	35	1211	45	243	865	909
Grp Sat Flow(s),veh/h/ln	1610	0	0	1325	0	1585	1457	1763	1584	1781	1763	1842
Q Serve(g_s), s	0.0	0.0	0.0	17.6	0.0	11.7	1.6	35.8	2.0	9.4	0.0	0.0
Cycle Q Clear(g_c), s	13.9	0.0	0.0	31.5	0.0	11.7	1.6	35.8	2.0	9.4	0.0	0.0
Prop In Lane	0.64		0.17	0.83		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	391	0	0	333	0	349	206	2016	906	332	1096	1146
V/C Ratio(X)	0.42	0.00	0.00	0.80	0.00	0.39	0.17	0.60	0.05	0.73	0.79	0.79
Avail Cap(c_a), veh/h	464	0	0	402	0	429	263	2016	906	502	1096	1146
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.0	0.0	0.0	61.2	0.0	53.2	13.4	22.3	15.1	18.3	0.0	0.0
Incr Delay (d2), s/veh	0.9	0.0	0.0	9.7	0.0	0.9	0.4	1.3	0.1	3.1	5.8	5.7
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	9.9	0.0	0.0	17.1	0.0	8.4	1.0	20.9	1.3	6.2	3.2	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	54.9	0.0	0.0	71.0	0.0	54.1	13.7	23.7	15.2	21.4	5.8	5.7
LnGrp LOS	D			E		D	B	C	B	C	A	A
Approach Vol, veh/h	164			402			1291			2017		
Approach Delay, s/veh	54.9			65.2			23.1			7.6		
Approach LOS	D			E			C			A		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.7	106.3		41.9	19.8	98.3		41.9				
Change Period (Y+Rc), s	7.8	6.8		6.7	7.8	6.8		6.7				
Max Green Setting (Gmax), s	10.2	85.2		43.3	27.2	68.2		43.3				
Max Q Clear Time (g_c+l1), s	3.6	2.0		33.5	11.4	37.8		15.9				
Green Ext Time (p_c), s	0.0	29.6		1.7	0.6	12.0		1.1				
Intersection Summary												
HCM 7th Control Delay, s/veh	20.8											
HCM 7th LOS	C											

Synchro 12 Report

Lanes, Volumes, Timings

3-2027 BUILD AM PEAK HOUR

2: N. Courtenay Pkwy & S.R. 528 EB on-off Ramps

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	857	0	979	0	0	0	0	1167	352	263	1011	0
Future Volume (vph)	857	0	979	0	0	0	0	1167	352	263	1011	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	6%	2%	2%	2%	2%	2%	2%	2%	2%	7%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	912	0	1041	0	0	0	0	1241	374	280	1076	0
Turn Type	Prot		Prot					NA	Perm	Prot	NA	
Protected Phases	7		7					6		5	2	
Permitted Phases									6			
Detector Phase	7		7					6	6	5	2	
Switch Phase												
Minimum Initial (s)	5.0		5.0					12.0	12.0	5.0	12.0	
Minimum Split (s)	9.5		9.5					25.4	25.4	25.8	25.4	
Total Split (s)	60.0		60.0					64.0	64.0	36.0	100.0	
Total Split (%)	37.5%		37.5%					40.0%	40.0%	22.5%	62.5%	
Maximum Green (s)	55.5		55.5					56.6	56.6	28.2	92.6	
Yellow Time (s)	3.5		3.5					4.8	4.8	4.8	4.8	
All-Red Time (s)	1.0		1.0					2.6	2.6	3.0	2.6	
Lost Time Adjust (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5		4.5					7.4	7.4	7.8	7.4	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0		3.0					4.0	4.0	4.0	4.0	
Recall Mode	None		None					C-Max	C-Max	None	C-Max	
Act Effct Green (s)	55.5		55.5					56.6	56.6	28.2	92.6	
Actuated g/C Ratio	0.35		0.35					0.35	0.35	0.18	0.58	
v/c Ratio	0.80		0.97					0.71	0.48	1.01	0.56	
Control Delay (s/veh)	53.4		64.1					61.9	22.6	98.8	15.4	
Queue Delay	3.3		0.0					5.1	0.0	0.0	0.8	
Total Delay (s/veh)	56.7		64.1					67.0	22.6	98.8	16.2	
LOS	E		E					E	C	F	B	
Approach Delay (s/veh)		60.6						56.7			33.2	
Approach LOS		E						E			C	
Queue Length 50th (ft)	444		538					486	176	~305	456	
Queue Length 95th (ft)	529		#706					536	m282	#500	531	
Internal Link Dist (ft)		674			677			1602			365	
Turn Bay Length (ft)	385		385						725			
Base Capacity (vph)	1145		1073					1739	783	277	1911	
Starvation Cap Reductn	0		0					0	0	0	494	
Spillback Cap Reductn	148		0					428	0	0	0	
Storage Cap Reductn	0		0					0	0	0	0	
Reduced v/c Ratio	0.91		0.97					0.95	0.48	1.01	0.76	
Intersection Summary												
Cycle Length: 160												
Actuated Cycle Length: 160												
Offset: 73 (46%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow												
Natural Cycle: 90												

Synchro 12 Report

2: N. Courtenay Pkwy & S.R. 528 EB on-off Ramps

Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay (s/veh): 51.8	Intersection LOS: D
Intersection Capacity Utilization 126.0%	ICU Level of Service H
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 2: N. Courtenay Pkwy & S.R. 528 EB on-off Ramps



HCM 7th Signalized Intersection Summary
2: N. Courtenay Pkwy & S.R. 528 EB on-off Ramps

3-2027 BUILD AM PEAK HOUR

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	857	0	979	0	0	0	0	1167	352	263	1011	0
Future Volume (veh/h)	857	0	979	0	0	0	0	1167	352	263	1011	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	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
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1811	0	1870				0	1870	1870	1796	1870	0
Adj Flow Rate, veh/h	912	0	0				0	1241	0	280	1076	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	6	0	2				0	2	2	7	2	0
Cap, veh/h	989	0					0	2072		300	2239	0
Arrive On Green	0.30	0.00	0.00				0.00	0.13	0.00	0.06	0.21	0.00
Sat Flow, veh/h	3346	0	2790				0	5274	1585	1711	3647	0
Grp Volume(v), veh/h	912	0	0				0	1241	0	280	1076	0
Grp Sat Flow(s),veh/h/ln	1673	0	1395				0	1702	1585	1711	1777	0
Q Serve(g_s), s	42.2	0.0	0.0				0.0	36.6	0.0	26.1	42.6	0.0
Cycle Q Clear(g_c), s	42.2	0.0	0.0				0.0	36.6	0.0	26.1	42.6	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	989	0					0	2072		300	2239	0
V/C Ratio(X)	0.92	0.00					0.00	0.60		0.93	0.48	0.00
Avail Cap(c_a), veh/h	1161	0					0	2072		302	2239	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	0.33	0.33	0.33	0.33	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	0.00	0.84	0.84	0.00
Uniform Delay (d), s/veh	54.6	0.0	0.0				0.0	57.0	0.0	74.4	40.3	0.0
Incr Delay (d2), s/veh	11.0	0.0	0.0				0.0	1.3	0.0	30.9	0.6	0.0
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	26.7	0.0	0.0				0.0	23.8	0.0	20.4	27.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	65.5	0.0	0.0				0.0	58.3	0.0	105.4	40.9	0.0
LnGrp LOS	E							E		F	D	
Approach Vol, veh/h	912						1241			1356		
Approach Delay, s/veh	65.5						58.3			54.2		
Approach LOS	E						E			D		
Timer - Assigned Phs	2			4			5			6		
Phs Duration (G+Y+Rc), s	108.2			51.8			35.9			72.3		
Change Period (Y+Rc), s	7.4			4.5			7.8			7.4		
Max Green Setting (Gmax), s	92.6			55.5			28.2			56.6		
Max Q Clear Time (g_c+I1), s	44.6			44.2			28.1			38.6		
Green Ext Time (p_c), s	13.6			3.0			0.0			10.1		
Intersection Summary												
HCM 7th Control Delay, s/veh	58.6											
HCM 7th LOS	E											
Notes												
Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.												

Synchro 12 Report

Lanes, Volumes, Timings

3-2027 BUILD AM PEAK HOUR

3: N. Courtenay Pkwy & S.R. 528 WB on-off Ramps

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔↔		↗	↔↔	↗↗			↗↗↗	↗
Traffic Volume (vph)	0	0	0	239	0	427	556	1593	0	0	1133	514
Future Volume (vph)	0	0	0	239	0	427	556	1593	0	0	1133	514
Confl. Peds. (#/hr)						1						
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	2%	2%	2%	4%	3%	4%	2%	2%	4%	10%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	257	0	459	598	1713	0	0	1218	553
Turn Type				Prot		Perm	Prot	NA			NA	Perm
Protected Phases				3			1	6			2	
Permitted Phases						3						2
Detector Phase				3		3	1	6			2	2
Switch Phase												
Minimum Initial (s)				7.0		7.0	5.0	12.0			12.0	12.0
Minimum Split (s)				14.0		14.0	22.5	22.5			22.5	22.5
Total Split (s)				40.0		40.0	53.0	120.0			67.0	67.0
Total Split (%)				25.0%		25.0%	33.1%	75.0%			41.9%	41.9%
Maximum Green (s)				33.0		33.0	45.1	112.5			59.5	59.5
Yellow Time (s)				4.0		4.0	4.8	5.3			5.3	5.3
All-Red Time (s)				3.0		3.0	3.1	2.2			2.2	2.2
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				7.0		7.0	7.9	7.5			7.5	7.5
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0		3.0	3.0	3.0			4.0	4.0
Recall Mode				None		None	Min	C-Max			C-Max	C-Max
Act Effct Green (s)				33.0		33.0	33.6	112.5			71.0	71.0
Actuated g/C Ratio				0.21		0.21	0.21	0.70			0.44	0.44
v/c Ratio				0.36		1.20	0.84	0.70			0.55	0.73
Control Delay (s/veh)				56.2		154.3	62.5	36.9			34.5	29.7
Queue Delay				0.0		0.0	0.5	48.5			0.3	0.0
Total Delay (s/veh)				56.2		154.3	63.0	85.4			34.9	29.7
LOS				E		F	E	F			C	C
Approach Delay (s/veh)					119.1			79.6			33.3	
Approach LOS					F			E			C	
Queue Length 50th (ft)				120		~506	293	959			340	312
Queue Length 95th (ft)				165		#735	351	1031			419	510
Internal Link Dist (ft)		690			789			365			641	
Turn Bay Length (ft)				150		275						90
Base Capacity (vph)				708		383	958	2440			2214	757
Starvation Cap Reductn				0		0	97	1088			0	0
Spillback Cap Reductn				0		0	0	0			422	0
Storage Cap Reductn				0		0	0	0			0	0
Reduced v/c Ratio				0.36		1.20	0.69	1.27			0.68	0.73
Intersection Summary												
Cycle Length: 160												
Actuated Cycle Length: 160												

Synchro 12 Report

Lanes, Volumes, Timings

3-2027 BUILD AM PEAK HOUR

3: N. Courtenay Pkwy & S.R. 528 WB on-off Ramps

Offset: 25 (16%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.20

Intersection Signal Delay (s/veh): 68.4

Intersection LOS: E

Intersection Capacity Utilization 126.0%

ICU Level of Service H

Analysis Period (min) 15

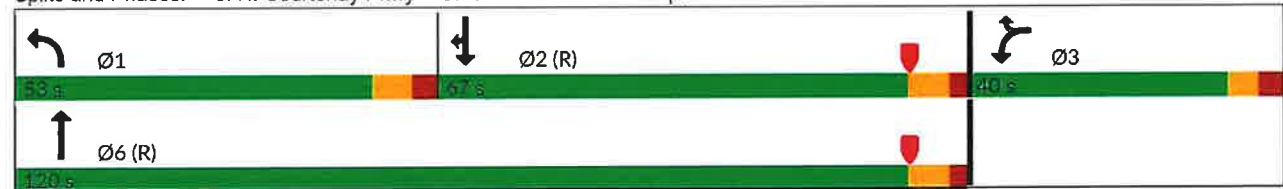
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 3: N. Courtenay Pkwy & S.R. 528 WB on-off Ramps



HCM 7th Signalized Intersection Summary
3: N. Courtenay Pkwy & S.R. 528 WB on-off Ramps

3-2027 BUILD AM PEAK HOUR

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔		↔	↔	↔			↔	↔
Traffic Volume (veh/h)	0	0	0	239	0	427	556	1593	0	0	1133	514
Future Volume (veh/h)	0	0	0	239	0	427	556	1593	0	0	1133	514
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Lane Width Adj.				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	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
Work Zone On Approach				No				No				No
Adj Sat Flow, veh/h/ln				1870	0	1841	1856	1841	0	0	1841	1752
Adj Flow Rate, veh/h				257	0	389	598	1713	0	0	1218	423
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				2	0	4	3	4	0	0	4	10
Cap, veh/h				713	0	322	653	2459	0	0	2327	673
Arrive On Green				0.21	0.00	0.21	0.38	1.00	0.00	0.00	0.46	0.46
Sat Flow, veh/h				3456	0	1560	3428	3589	0	0	5191	1454
Grp Volume(v), veh/h				257	0	389	598	1713	0	0	1218	423
Grp Sat Flow(s),veh/h/ln				1728	0	1560	1714	1749	0	0	1675	1454
Q Serve(g_s), s				10.2	0.0	33.0	26.5	0.0	0.0	0.0	27.5	35.3
Cycle Q Clear(g_c), s				10.2	0.0	33.0	26.5	0.0	0.0	0.0	27.5	35.3
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				713	0	322	653	2459	0	0	2327	673
V/C Ratio(X)				0.36	0.00	1.21	0.92	0.70	0.00	0.00	0.52	0.63
Avail Cap(c_a), veh/h				713	0	322	966	2459	0	0	2327	673
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.58	0.58	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				54.5	0.0	63.5	48.3	0.0	0.0	0.0	30.4	32.5
Incr Delay (d2), s/veh				0.3	0.0	119.5	6.0	1.0	0.0	0.0	0.8	4.4
Initial Q Delay(d3), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				7.8	0.0	34.5	13.8	0.6	0.0	0.0	16.5	18.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh				54.8	0.0	183.0	54.3	1.0	0.0	0.0	31.3	36.9
LnGrp LOS				D		F	D	A			C	D
Approach Vol, veh/h				646				2311				1641
Approach Delay, s/veh				132.0				14.8				32.7
Approach LOS				F				B				C
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	38.4	81.6				120.0		40.0				
Change Period (Y+Rc), s	7.9	7.5				7.5		7.0				
Max Green Setting (Gmax), s	45.1	59.5				112.5		33.0				
Max Q Clear Time (g_c+I1), s	28.5	37.3				2.0		35.0				
Green Ext Time (p_c), s	2.0	13.8				22.9		0.0				
Intersection Summary												
HCM 7th Control Delay, s/veh				37.6								
HCM 7th LOS				D								

Lanes, Volumes, Timings

3-2027 BUILD AM PEAK HOUR

11: N. Courtenay Pkwy & Proposed Dwy 1

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	35	1343	11	0	1822
Future Volume (vph)	0	35	1343	11	0	1822
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	38	1472	0	0	1980
Sign Control	Stop		Free			Free
Intersection Summary						
Control Type: Unsignalized						
Intersection Capacity Utilization 53.7%				ICU Level of Service A		
Analysis Period (min) 15						

HCM 7th TWSC
11: N. Courtenay Pkwy & Proposed Dwy 1

3-2027 BUILD AM PEAK HOUR

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	35	1343	11	0	1822
Future Vol, veh/h	0	35	1343	11	0	1822
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	0	38	1460	12	0	1980
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	736	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	*716	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		0	-	-		-
Mov Cap-1 Maneuver	-	*716	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB		SB		
HCM Ctrl Dly, s/v	10.31	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT			
Capacity (veh/h)	-	-	716	-		
HCM Lane V/C Ratio	-	-	0.053	-		
HCM Ctrl Dly (s/v)	-	-	10.3	-		
HCM Lane LOS	-	-	B	-		
HCM 95th %tile Q(veh)	-	-	0.2	-		
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s				
+: Computation Not Defined		*: All major volume in platoon				

Synchro 12 Report

Lanes, Volumes, Timings
12: Pioneer Rd & Proposed Dwy2

3-2027 BUILD AM PEAK HOUR

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	11	321	379	0	0	34
Future Volume (vph)	11	321	379	0	0	34
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	361	412	0	37	0
Sign Control		Free	Free		Stop	
Intersection Summary						
Control Type: Unsignalized						
Intersection Capacity Utilization 35.8%				ICU Level of Service A		
Analysis Period (min) 15						

HCM 7th TWSC
12: Pioneer Rd & Proposed Dwy2

3-2027 BUILD AM PEAK HOUR

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	11	321	379	0	0	34
Future Vol, veh/h	11	321	379	0	0	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	12	349	412	0	0	37
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	412	0	-	0	785	412
Stage 1	-	-	-	-	412	-
Stage 2	-	-	-	-	373	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1147	-	-	-	365	640
Stage 1	-	-	-	-	669	-
Stage 2	-	-	-	-	732	-
Platoon blocked, %		-	-	-	0	
Mov Cap-1 Maneuver	1147	-	-	-	361	640
Mov Cap-2 Maneuver	-	-	-	-	361	-
Stage 1	-	-	-	-	660	-
Stage 2	-	-	-	-	732	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	0.27	0		10.97		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	60	-	-	-	640	
HCM Lane V/C Ratio	0.01	-	-	-	0.058	
HCM Ctrl Dly (s/v)	8.2	0	-	-	11	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.2	

Lanes, Volumes, Timings
13: Pioneer Rd & Shared Driveway

3-2027 BUILD AM PEAK HOUR

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	306	67	13	377	2	41	1	12	2	0	35
Future Volume (vph)	15	306	67	13	377	2	41	1	12	2	0	35
Confl. Peds. (#/hr)	6		3	3		6						
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
Heavy Vehicles (%)	2%	2%	2%	2%	4%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	422	0	0	426	0	0	59	0	0	40	0
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Control Type: Unsignalized												
Intersection Capacity Utilization 43.0% ICU Level of Service A												
Analysis Period (min) 15												

Synchro 12 Report

HCM 7th TWSC
13: Pioneer Rd & Shared Driveway

3-2027 BUILD AM PEAK HOUR

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	15	306	67	13	377	2	41	1	12	2	0	35
Future Vol, veh/h	15	306	67	13	377	2	41	1	12	2	0	35
Conflicting Peds, #/hr	6	0	3	3	0	6	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	4	2	2	2	2	2	2	2
Mvmt Flow	16	333	73	14	410	2	45	1	13	2	0	38

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	418	0	0	408	0	0	843	851	372	811	886	417
Stage 1	-	-	-	-	-	-	405	405	-	445	445	-
Stage 2	-	-	-	-	-	-	438	446	-	366	441	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1141	-	-	1150	-	-	284	297	674	298	283	636
Stage 1	-	-	-	-	-	-	623	599	-	592	575	-
Stage 2	-	-	-	-	-	-	597	574	-	654	577	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1135	-	-	1147	-	-	257	285	672	280	271	632
Mov Cap-2 Maneuver	-	-	-	-	-	-	257	285	-	280	271	-
Stage 1	-	-	-	-	-	-	609	586	-	579	562	-
Stage 2	-	-	-	-	-	-	552	561	-	628	564	-

Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.32			0.27			20.01			11.53		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	298	67	-	-	60	-	-	592
HCM Lane V/C Ratio	0.197	0.014	-	-	0.012	-	-	0.068
HCM Ctrl Dly (s/v)	20	8.2	0	-	8.2	0	-	11.5
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.7	0	-	-	0	-	-	0.2

Synchro 12 Report

**BUILD DS
ALTERNATIVE 0**

Lanes, Volumes, Timings
1: N. Courtenay Pkwy & Pioneer Rd

3-2027 BUILD DS PEAK HOUR

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	21	41	149	23	126	52	1561	94	140	1644	36
Future Volume (vph)	133	21	41	149	23	126	52	1561	94	140	1644	36
Confl. Peds. (#/hr)			4	4			2		1	1		2
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	6%	3%	2%	5%	4%	5%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	210	0	0	185	135	56	1678	101	151	1807	0
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4	6		6	2		
Detector Phase	8	8		4	4	4	1	6	6	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	5.0	15.0	15.0	5.0	15.0	
Minimum Split (s)	41.7	41.7		40.7	40.7	40.7	12.8	30.8	30.8	12.8	32.8	
Total Split (s)	42.0	42.0		42.0	42.0	42.0	18.0	108.0	108.0	20.0	110.0	
Total Split (%)	24.7%	24.7%		24.7%	24.7%	24.7%	10.6%	63.5%	63.5%	11.8%	64.7%	
Maximum Green (s)	35.3	35.3		35.3	35.3	35.3	10.2	101.2	101.2	12.2	103.2	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	4.8	4.8	4.8	4.8	4.8	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	2.0	2.0	3.0	2.0	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.7			6.7	6.7	7.8	6.8	6.8	7.8	6.8	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.5	3.5		3.5	3.5	3.5	3.0	3.5	3.5	3.0	3.5	
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0	7.0		7.0	
Flash Don't Walk (s)	28.0	28.0		27.0	27.0	27.0		17.0	17.0		19.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0	0		0	
Act Effct Green (s)		35.3			35.3	35.3	108.5	101.9	101.9	117.2	108.5	
Actuated g/C Ratio		0.21			0.21	0.21	0.64	0.60	0.60	0.69	0.64	
v/c Ratio		1.14			0.76	0.33	0.43	0.82	0.11	0.84	0.83	
Control Delay (s/veh)		164.6			83.5	14.8	23.2	31.2	5.1	68.6	29.0	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay (s/veh)		164.6			83.5	14.8	23.2	31.2	5.1	68.6	29.0	
LOS		F			F	B	C	C	A	E	C	
Approach Delay (s/veh)		164.6			54.5			29.5			32.1	
Approach LOS		F			D			C			C	
Queue Length 50th (ft)		~265			196	16	18	756	12	91	811	
Queue Length 95th (ft)		#447			#315	81	46	861	39	#221	972	
Internal Link Dist (ft)		649			211			778			658	
Turn Bay Length (ft)						125	150		105	245		
Base Capacity (vph)		184			244	404	155	2050	925	187	2176	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		1.14			0.76	0.33	0.36	0.82	0.11	0.81	0.83	

Synchro 12 Report

Lanes, Volumes, Timings
1: N. Courtenay Pkwy & Pioneer Rd

3-2027 BUILD DS PEAK HOUR

Intersection Summary

Cycle Length: 170

Actuated Cycle Length: 170

Offset: 105 (62%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.14

Intersection Signal Delay (s/veh): 39.1

Intersection LOS: D

Intersection Capacity Utilization 87.8%

ICU Level of Service E

Analysis Period (min) 15

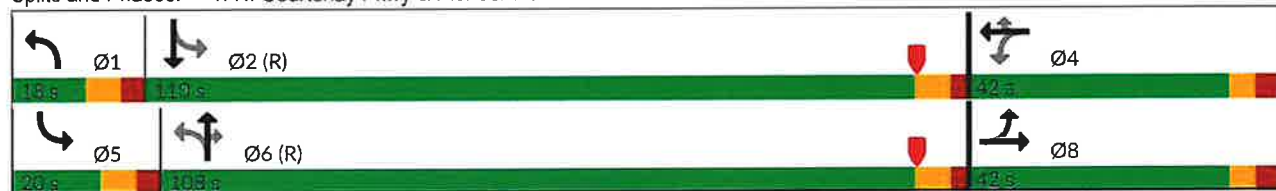
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: N. Courtenay Pkwy & Pioneer Rd



HCM 7th Signalized Intersection Summary
1: N. Courtenay Pkwy & Pioneer Rd

3-2027 BUILD DS PEAK HOUR

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	133	21	41	149	23	126	52	1561	94	140	1644	36
Future Volume (veh/h)	133	21	41	149	23	126	52	1561	94	140	1644	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	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
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1811	1856	1870	1826	1841	1826	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	143	23	39	160	25	87	56	1678	71	151	1768	38
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	6	3	2	5	4	5	2	2	2	2	2
Cap, veh/h	216	29	49	226	29	251	261	2388	1063	219	2436	52
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.03	0.67	0.67	0.08	1.00	1.00
Sat Flow, veh/h	1111	179	303	1152	180	1548	1739	3554	1583	1781	3555	76
Grp Volume(v), veh/h	205	0	0	185	0	87	56	1678	71	151	881	925
Grp Sat Flow(s),veh/h/ln	1593	0	0	1332	0	1548	1739	1777	1583	1781	1777	1855
Q Serve(g_s), s	0.0	0.0	0.0	2.5	0.0	8.5	1.7	49.9	2.6	4.8	0.0	0.0
Cycle Q Clear(g_c), s	20.5	0.0	0.0	23.1	0.0	8.5	1.7	49.9	2.6	4.8	0.0	0.0
Prop In Lane	0.70		0.19	0.86		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	294	0	0	255	0	251	261	2388	1063	219	1218	1271
V/C Ratio(X)	0.70	0.00	0.00	0.72	0.00	0.35	0.21	0.70	0.07	0.69	0.72	0.73
Avail Cap(c_a), veh/h	358	0	0	317	0	322	317	2388	1063	274	1218	1271
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	68.3	0.0	0.0	69.4	0.0	63.2	7.9	17.3	9.6	22.2	0.0	0.0
Incr Delay (d2), s/veh	5.0	0.0	0.0	6.7	0.0	1.0	0.4	1.8	0.1	5.2	3.8	3.7
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	13.9	0.0	0.0	13.1	0.0	6.2	1.2	26.8	1.7	6.2	2.3	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	73.3	0.0	0.0	76.1	0.0	64.2	8.4	19.1	9.7	27.4	3.8	3.7
LnGrp LOS	E			E		E	A	B	A	C	A	A
Approach Vol, veh/h	205			272			1805			1957		
Approach Delay, s/veh	73.3			72.3			18.4			5.5		
Approach LOS	E			E			B			A		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.4	123.3		34.3	14.7	121.0		34.3				
Change Period (Y+Rc), s	7.8	6.8		6.7	7.8	6.8		6.7				
Max Green Setting (Gmax), s	10.2	103.2		35.3	12.2	101.2		35.3				
Max Q Clear Time (g_c+I1), s	3.7	2.0		25.1	6.8	51.9		22.5				
Green Ext Time (p_c), s	0.0	32.3		1.1	0.2	23.9		1.1				
Intersection Summary												
HCM 7th Control Delay, s/veh				18.6								
HCM 7th LOS				B								

Synchro 12 Report

Lanes, Volumes, Timings

3-2027 BUILD DS PEAK HOUR

2: N. Courtenay Pkwy & S.R. 528 EB on-off Ramps

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰		↱↱					↰↰↰	↱	↰	↰↰	
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	6%	2%	2%	2%	2%	2%	2%	2%	2%	7%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type	Prot		Prot						Perm	Prot		
Protected Phases	7		7					6		5	2	
Permitted Phases									6			
Detector Phase	7		7					6	6	5	2	
Switch Phase												
Minimum Initial (s)	5.0		5.0					12.0	12.0	5.0	12.0	
Minimum Split (s)	9.5		9.5					25.4	25.4	25.8	25.4	
Total Split (s)	40.0		40.0					85.0	85.0	45.0	130.0	
Total Split (%)	23.5%		23.5%					50.0%	50.0%	26.5%	76.5%	
Maximum Green (s)	35.5		35.5					77.6	77.6	37.2	122.6	
Yellow Time (s)	3.5		3.5					4.8	4.8	4.8	4.8	
All-Red Time (s)	1.0		1.0					2.6	2.6	3.0	2.6	
Lost Time Adjust (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5		4.5					7.4	7.4	7.8	7.4	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0		3.0					4.0	4.0	4.0	4.0	
Recall Mode	None		None					C-Max	C-Max	None	C-Max	
Act Effct Green (s)												
Actuated g/C Ratio												
v/c Ratio												
Control Delay (s/veh)												
Queue Delay												
Total Delay (s/veh)												
LOS												
Approach Delay (s/veh)												
Approach LOS												
Queue Length 50th (ft)												
Queue Length 95th (ft)												
Internal Link Dist (ft)		674			677			1602			365	
Turn Bay Length (ft)												
Base Capacity (vph)												
Starvation Cap Reductn												
Spillback Cap Reductn												
Storage Cap Reductn												
Reduced v/c Ratio												
Intersection Summary												
Cycle Length: 170												
Actuated Cycle Length: 170												
Offset: 99 (58%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow												
Natural Cycle: 65												

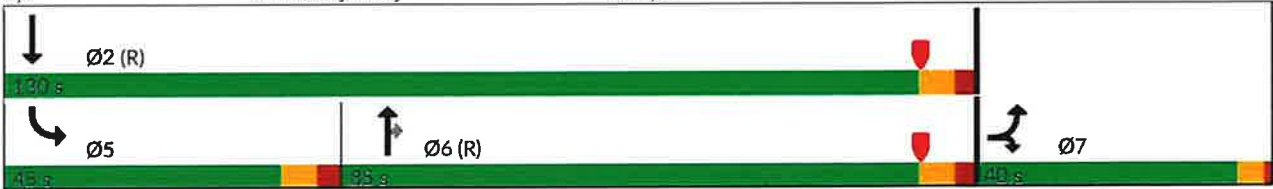
Synchro 12 Report

Lanes, Volumes, Timings
2: N. Courtenay Pkwy & S.R. 528 EB on-off Ramps

3-2027 BUILD DS PEAK HOUR

Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.00	
Intersection Signal Delay (s/veh): 0.0	Intersection LOS: A
Intersection Capacity Utilization 38.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: N. Courtenay Pkwy & S.R. 528 EB on-off Ramps



HCM 7th Signalized Intersection Summary
2: N. Courtenay Pkwy & S.R. 528 EB on-off Ramps

3-2027 BUILD DS PEAK HOUR

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	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
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1811	0	1870				0	1870	1870	1796	1870	0
Adj Flow Rate, veh/h	0	0	0				0	0	0	0	0	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	6	0	2				0	2	2	7	2	0
Cap, veh/h	2	0					0	4884		1	3399	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	3346	0	2790				0	5274	1585	1711	3647	0
Grp Volume(v), veh/h	0	0	0				0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1673	0	1395				0	1702	1585	1711	1777	0
Q Serve(g_s), s	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	2	0					0	4884		1	3399	0
V/C Ratio(X)	0.00	0.00					0.00	0.00		0.00	0.00	0.00
Avail Cap(c_a), veh/h	699	0					0	4884		374	3399	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00				0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS												
Approach Vol, veh/h	0						0			0		
Approach Delay, s/veh	0.0						0.0			0.0		
Approach LOS												
Timer - Assigned Phs	2			4		5	6					
Phs Duration (G+Y+Rc), s	170.0			0.0		0.0	170.0					
Change Period (Y+Rc), s	7.4			4.5		7.8	7.4					
Max Green Setting (Gmax), s	122.6			35.5		37.2	77.6					
Max Q Clear Time (g_c+I1), s	0.0			0.0		0.0	0.0					
Green Ext Time (p_c), s	0.0			0.0		0.0	0.0					
Intersection Summary												
HCM 7th Control Delay, s/veh	0.0											
HCM 7th LOS	A											
Notes												
Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.												

Synchro 12 Report

Lanes, Volumes, Timings

3-2027 BUILD DS PEAK HOUR

3: N. Courtenay Pkwy & S.R. 528 WB on-off Ramps

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰↱		↱	↰↱	↱↱			↱↱↱	↱
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Confl. Peds. (#/hr)						1						
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	2%	2%	2%	4%	3%	4%	2%	2%	4%	10%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type				Prot		Perm	Prot					Perm
Protected Phases				3			1	6			2	
Permitted Phases						3						2
Detector Phase				3		3	1	6			2	2
Switch Phase												
Minimum Initial (s)				7.0		7.0	5.0	12.0			12.0	12.0
Minimum Split (s)				14.0		14.0	22.5	22.5			22.5	22.5
Total Split (s)				30.0		30.0	52.0	140.0			88.0	88.0
Total Split (%)				17.6%		17.6%	30.6%	82.4%			51.8%	51.8%
Maximum Green (s)				23.0		23.0	44.1	132.5			80.5	80.5
Yellow Time (s)				4.0		4.0	4.8	5.3			5.3	5.3
All-Red Time (s)				3.0		3.0	3.1	2.2			2.2	2.2
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				7.0		7.0	7.9	7.5			7.5	7.5
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0		3.0	3.0	3.0			4.0	4.0
Recall Mode				None		None	Min	C-Max			C-Max	C-Max
Act Effct Green (s)												
Actuated g/C Ratio												
v/c Ratio												
Control Delay (s/veh)												
Queue Delay												
Total Delay (s/veh)												
LOS												
Approach Delay (s/veh)												
Approach LOS												
Queue Length 50th (ft)												
Queue Length 95th (ft)												
Internal Link Dist (ft)		690			789			365			641	
Turn Bay Length (ft)												
Base Capacity (vph)												
Starvation Cap Reductn												
Spillback Cap Reductn												
Storage Cap Reductn												
Reduced v/c Ratio												
Intersection Summary												
Cycle Length: 170												
Actuated Cycle Length: 170												

Synchro 12 Report

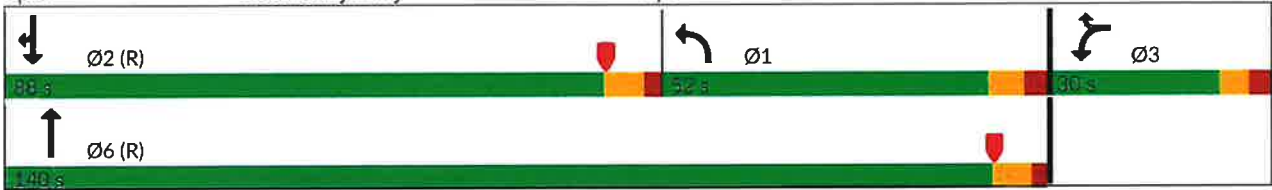
Lanes, Volumes, Timings

3-2027 BUILD DS PEAK HOUR

3: N. Courtenay Pkwy & S.R. 528 WB on-off Ramps

Offset: 62 (36%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.00	
Intersection Signal Delay (s/veh): 0.0	Intersection LOS: A
Intersection Capacity Utilization 38.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: N. Courtenay Pkwy & S.R. 528 WB on-off Ramps



HCM 7th Signalized Intersection Summary
3: N. Courtenay Pkwy & S.R. 528 WB on-off Ramps

3-2027 BUILD DS PEAK HOUR

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔↔		↗	↔↔	↑↑			↑↑↑	↗
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Lane Width Adj.				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)				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
Work Zone On Approach				No				No				No
Adj Sat Flow, veh/h/ln				1870	0	1841	1856	1841	0	0	1841	1752
Adj Flow Rate, veh/h				0	0	0	0	0	0	0	0	0
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				2	0	4	3	4	0	0	4	10
Cap, veh/h				2	0	1	1494	3335	0	0	2380	703
Arrive On Green				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h				3456	0	1560	3428	3589	0	0	5191	1485
Grp Volume(v), veh/h				0	0	0	0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln				1728	0	1560	1714	1749	0	0	1675	1485
Q Serve(g_s), s				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				2	0	1	1494	3335	0	0	2380	703
V/C Ratio(X)				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h				468	0	211	1494	3335	0	0	2380	703
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS												
Approach Vol, veh/h					0			0			0	
Approach Delay, s/veh					0.0			0.0			0.0	
Approach LOS												
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	82.0	88.0				170.0		0.0				
Change Period (Y+Rc), s	7.9	7.5				* 7.9		7.0				
Max Green Setting (Gmax), s	44.1	80.5				* 1.3E+02		23.0				
Max Q Clear Time (g_c+l1), s	0.0	0.0				0.0		0.0				
Green Ext Time (p_c), s	0.0	0.0				0.0		0.0				
Intersection Summary												
HCM 7th Control Delay, s/veh				0.0								
HCM 7th LOS				A								
Notes												
* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.												

Synchro 12 Report

Lanes, Volumes, Timings

3-2027 BUILD DS PEAK HOUR

11: N. Courtenay Pkwy & Proposed Dwy 1

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Sign Control	Stop		Free			Free
Intersection Summary						
Control Type: Unsignalized						
Intersection Capacity Utilization 0.0%			ICU Level of Service A			
Analysis Period (min) 15						

HCM 7th TWSC
11: N. Courtenay Pkwy & Proposed Dwy 1

3-2027 BUILD DS PEAK HOUR

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0
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	0	0	0	0	0	0
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	0	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	-	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB		SB		
HCM Ctrl Dly, s/v	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT			
Capacity (veh/h)	-	-	-	-		
HCM Lane V/C Ratio	-	-	-	-		
HCM Ctrl Dly (s/v)	-	-	0	-		
HCM Lane LOS	-	-	A	-		
HCM 95th %tile Q(veh)	-	-	-	-		

Synchro 12 Report

Lanes, Volumes, Timings
12: Pioneer Rd & Proposed Dwy2

3-2027 BUILD DS PEAK HOUR

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	24	148	157	0	0	18
Future Volume (vph)	24	148	157	0	0	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	187	171	0	20	0
Sign Control		Free	Free		Stop	
Intersection Summary						
Control Type: Unsignalized						
Intersection Capacity Utilization 30.7%				ICU Level of Service A		
Analysis Period (min) 15						

HCM 7th TWSC
12: Pioneer Rd & Proposed Dwy2

3-2027 BUILD DS PEAK HOUR

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	24	148	157	0	0	18
Future Vol, veh/h	24	148	157	0	0	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	26	161	171	0	0	20

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	171	0	0 384 171
Stage 1	-	-	- 171 -
Stage 2	-	-	- 213 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1407	-	- 644 873
Stage 1	-	-	- 859 -
Stage 2	-	-	- 846 -
Platoon blocked, %	-	-	- 0
Mov Cap-1 Maneuver	1407	-	- 631 873
Mov Cap-2 Maneuver	-	-	- 631 -
Stage 1	-	-	- 842 -
Stage 2	-	-	- 846 -

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	1.06	0	9.22
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	251	-	-	-	873
HCM Lane V/C Ratio	0.019	-	-	-	0.022
HCM Ctrl Dly (s/v)	7.6	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Synchro 12 Report

Lanes, Volumes, Timings
13: Pioneer Rd & Shared Driveway

3-2027 BUILD DS PEAK HOUR

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	138	37	3	155	1	64	0	8	2	0	27
Future Volume (vph)	27	138	37	3	155	1	64	0	8	2	0	27
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	4%	100%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	224	0	0	176	0	0	80	0	0	32	0
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Control Type: Unsignalized												
Intersection Capacity Utilization 40.1% ICU Level of Service A												
Analysis Period (min) 15												

HCM 7th TWSC
13: Pioneer Rd & Shared Driveway

3-2027 BUILD DS PEAK HOUR

Intersection												
Int Delay, s/veh	3.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	27	138	37	3	155	1	64	0	8	2	0	27
Future Vol, veh/h	27	138	37	3	155	1	64	0	8	2	0	27
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	4	100	2	2	2	2	2	2
Mvmt Flow	30	153	41	3	172	1	71	0	9	2	0	30

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	173	0	0	194	0	0	413	414	174	393	434	173
Stage 1	-	-	-	-	-	-	234	234	-	179	179	-
Stage 2	-	-	-	-	-	-	179	180	-	213	254	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Sig 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1403	-	-	1379	-	-	550	529	870	567	515	871
Stage 1	-	-	-	-	-	-	769	711	-	822	751	-
Stage 2	-	-	-	-	-	-	823	750	-	789	697	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1403	-	-	1379	-	-	517	515	870	546	501	871
Mov Cap-2 Maneuver	-	-	-	-	-	-	517	515	-	546	501	-
Stage 1	-	-	-	-	-	-	751	694	-	820	749	-
Stage 2	-	-	-	-	-	-	792	748	-	762	680	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.02	0.14	12.81	9.48
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	541	231	-	-	34	-	-	836
HCM Lane V/C Ratio	0.148	0.021	-	-	0.002	-	-	0.039
HCM Ctrl Dly (s/v)	12.8	7.6	0	-	7.6	0	-	9.5
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.5	0.1	-	-	0	-	-	0.1

Synchro 12 Report

**BUILD PM
ALTERNATIVE 0**

82

Lanes, Volumes, Timings
1: N. Courtenay Pkwy & Pioneer Rd

3-2027 BUILD PM PEAK HOUR

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	122	22	33	136	21	116	43	1580	124	161	1688	36
Future Volume (vph)	122	22	33	136	21	116	43	1580	124	161	1688	36
Confl. Peds. (#/hr)	2					2	2		3	3		2
Confl. Bikes (#/hr)												2
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	6%	2%	4%	2%	2%	6%	11%	2%	2%	2%	2%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	180	0	0	160	118	44	1612	127	164	1759	0
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4	6		6	2		
Detector Phase	8	8		4	4	4	1	6	6	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	5.0	15.0	15.0	5.0	15.0	
Minimum Split (s)	41.7	41.7		40.7	40.7	40.7	12.8	30.8	30.8	12.8	32.8	
Total Split (s)	42.0	42.0		42.0	42.0	42.0	18.0	108.0	108.0	20.0	110.0	
Total Split (%)	24.7%	24.7%		24.7%	24.7%	24.7%	10.6%	63.5%	63.5%	11.8%	64.7%	
Maximum Green (s)	35.3	35.3		35.3	35.3	35.3	10.2	101.2	101.2	12.2	103.2	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	4.8	4.8	4.8	4.8	4.8	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	2.0	2.0	3.0	2.0	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.7			6.7	6.7	7.8	6.8	6.8	7.8	6.8	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.5	3.5		3.5	3.5	3.5	3.0	3.5	3.5	3.0	3.5	
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0	7.0		7.0	
Flash Don't Walk (s)	28.0	28.0		27.0	27.0	27.0		17.0	17.0		19.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0	0		0	
Act Effct Green (s)		33.9			33.9	33.9	109.3	103.3	103.3	119.2	110.5	
Actuated g/C Ratio		0.20			0.20	0.20	0.64	0.61	0.61	0.70	0.65	
v/c Ratio		0.96			0.67	0.31	0.34	0.78	0.14	0.83	0.79	
Control Delay (s/veh)		118.2			77.3	10.6	15.6	28.6	6.8	57.9	14.3	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay (s/veh)		118.2			77.3	10.6	15.6	28.6	6.8	57.9	14.3	
LOS		F			E	B	B	C	A	E	B	
Approach Delay (s/veh)		118.2			49.0			26.7			18.0	
Approach LOS		F			D			C			B	
Queue Length 50th (ft)		193			165	0	14	700	24	79	877	
Queue Length 95th (ft)		#356			254	58	27	797	56	m125	m653	
Internal Link Dist (ft)		649			211			778			658	
Turn Bay Length (ft)						125	150		105	245		
Base Capacity (vph)		196			249	394	159	2078	930	204	2214	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		0.92			0.64	0.30	0.28	0.78	0.14	0.80	0.79	

Synchro 12 Report

Lanes, Volumes, Timings

3-2027 BUILD PM PEAK HOUR

1: N. Courtenay Pkwy & Pioneer Rd

Intersection Summary

Cycle Length: 170

Actuated Cycle Length: 170

Offset: 105 (62%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.96

Intersection Signal Delay (s/veh): 28.1

Intersection LOS: C

Intersection Capacity Utilization 86.9%

ICU Level of Service E

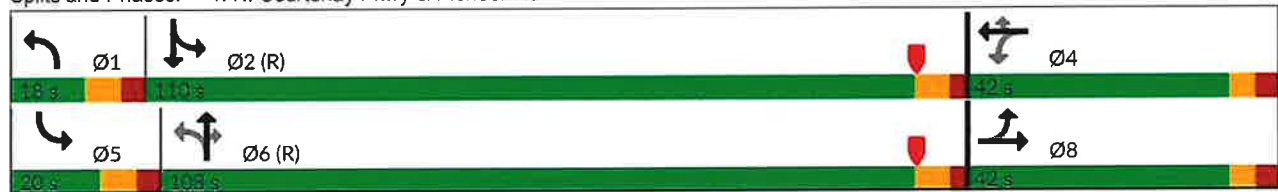
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: N. Courtenay Pkwy & Pioneer Rd



HCM 7th Signalized Intersection Summary
1: N. Courtenay Pkwy & Pioneer Rd

3-2027 BUILD PM PEAK HOUR

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	22	33	136	21	116	43	1580	124	161	1688	36
Future Volume (veh/h)	122	22	33	136	21	116	43	1580	124	161	1688	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1870	1841	1870	1870	1811	1737	1870	1870	1870	1870	1856
Adj Flow Rate, veh/h	124	22	29	139	21	72	44	1612	98	164	1722	36
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	6	2	4	2	2	6	11	2	2	2	2	3
Cap, veh/h	197	28	38	205	25	210	261	2473	1101	242	2531	53
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.03	0.70	0.70	0.08	1.00	1.00
Sat Flow, veh/h	1167	207	273	1203	182	1528	1654	3554	1582	1781	3558	74
Grp Volume(v), veh/h	175	0	0	160	0	72	44	1612	98	164	858	900
Grp Sat Flow(s),veh/h/ln	1647	0	0	1385	0	1528	1654	1777	1582	1781	1777	1855
Q Serve(g_s), s	0.0	0.0	0.0	2.2	0.0	7.2	1.3	42.9	3.4	4.8	0.0	0.0
Cycle Q Clear(g_c), s	17.0	0.0	0.0	19.2	0.0	7.2	1.3	42.9	3.4	4.8	0.0	0.0
Prop In Lane	0.71		0.17	0.87		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	263	0	0	230	0	210	261	2473	1101	242	1264	1320
V/C Ratio(X)	0.67	0.00	0.00	0.70	0.00	0.34	0.17	0.65	0.09	0.68	0.68	0.68
Avail Cap(c_a), veh/h	365	0	0	328	0	317	318	2473	1101	297	1264	1320
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	70.5	0.0	0.0	71.5	0.0	66.3	6.8	14.4	8.4	17.7	0.0	0.0
Incr Delay (d2), s/veh	3.5	0.0	0.0	4.5	0.0	1.2	0.3	1.4	0.2	4.5	2.9	2.9
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	12.2	0.0	0.0	11.5	0.0	5.3	0.8	23.0	2.1	5.8	1.9	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	74.0	0.0	0.0	76.0	0.0	67.5	7.1	15.7	8.5	22.2	2.9	2.9
LnGrp LOS	E			E		E	A	B	A	C	A	A
Approach Vol, veh/h		175			232			1754			1922	
Approach Delay, s/veh		74.0			73.4			15.1			4.6	
Approach LOS		E			E			B			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.2	127.7		30.1	14.8	125.1		30.1				
Change Period (Y+Rc), s	7.8	6.8		6.7	7.8	6.8		6.7				
Max Green Setting (Gmax), s	10.2	103.2		35.3	12.2	101.2		35.3				
Max Q Clear Time (g_c+I1), s	3.3	2.0		21.2	6.8	44.9		19.0				
Green Ext Time (p_c), s	0.0	30.0		1.1	0.2	23.9		1.0				
Intersection Summary												
HCM 7th Control Delay, s/veh			16.0									
HCM 7th LOS			B									

Synchro 12 Report

Lanes, Volumes, Timings

3-2027 BUILD PM PEAK HOUR

2: N. Courtenay Pkwy & S.R. 528 EB on-off Ramps

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 		 					  			 	
Traffic Volume (vph)	472	0	812	0	0	0	0	1428	315	396	1318	0
Future Volume (vph)	472	0	812	0	0	0	0	1428	315	396	1318	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	487	0	837	0	0	0	0	1472	325	408	1359	0
Turn Type	Prot		Prot					NA	Perm	Prot	NA	
Protected Phases	7		7					6		5	2	
Permitted Phases									6			
Detector Phase	7		7					6	6	5	2	
Switch Phase												
Minimum Initial (s)	5.0		5.0					12.0	12.0	5.0	12.0	
Minimum Split (s)	9.5		9.5					25.4	25.4	25.8	25.4	
Total Split (s)	40.0		40.0					85.0	85.0	45.0	130.0	
Total Split (%)	23.5%		23.5%					50.0%	50.0%	26.5%	76.5%	
Maximum Green (s)	35.5		35.5					77.6	77.6	37.2	122.6	
Yellow Time (s)	3.5		3.5					4.8	4.8	4.8	4.8	
All-Red Time (s)	1.0		1.0					2.6	2.6	3.0	2.6	
Lost Time Adjust (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5		4.5					7.4	7.4	7.8	7.4	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0		3.0					4.0	4.0	4.0	4.0	
Recall Mode	None		None					C-Max	C-Max	None	C-Max	
Act Effct Green (s)	35.5		35.5					77.6	77.6	37.2	122.6	
Actuated g/C Ratio	0.21		0.21					0.46	0.46	0.22	0.72	
v/c Ratio	0.69		1.19					0.66	0.37	1.13	0.57	
Control Delay (s/veh)	67.8		142.4					27.5	3.6	130.7	6.7	
Queue Delay	0.0		0.0					0.9	0.0	0.6	0.6	
Total Delay (s/veh)	67.8		142.4					28.4	3.6	131.4	7.3	
LOS	E		F					C	A	F	A	
Approach Delay (s/veh)		114.9						23.9			36.0	
Approach LOS		F						C			D	
Queue Length 50th (ft)	261		~552					230	0	~508	172	
Queue Length 95th (ft)	327		#702					307	m59	m#723	186	
Internal Link Dist (ft)		674			677			1602			365	
Turn Bay Length (ft)	385		385						725			
Base Capacity (vph)	710		706					2244	875	361	2382	
Starvation Cap Reductn	0		0					0	0	21	589	
Spillback Cap Reductn	0		0					451	0	0	0	
Storage Cap Reductn	0		0					0	0	0	0	
Reduced v/c Ratio	0.69		1.19					0.82	0.37	1.20	0.76	
Intersection Summary												
Cycle Length: 170												
Actuated Cycle Length: 170												
Offset: 99 (58%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow												
Natural Cycle: 110												

Synchro 12 Report

Lanes, Volumes, Timings

3-2027 BUILD PM PEAK HOUR

2: N. Courtenay Pkwy & S.R. 528 EB on-off Ramps

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.19

Intersection Signal Delay (s/veh): 52.9

Intersection LOS: D

Intersection Capacity Utilization 121.4%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

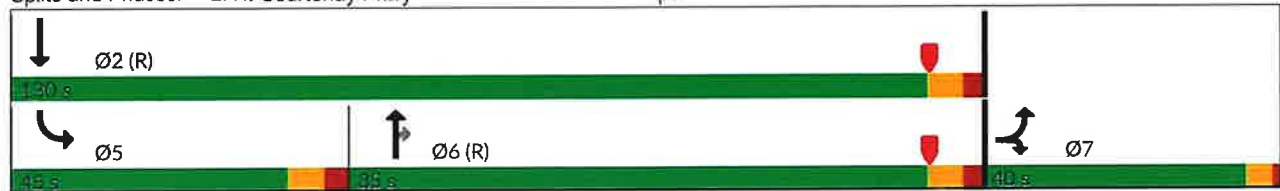
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: N. Courtenay Pkwy & S.R. 528 EB on-off Ramps



HCM 7th Signalized Intersection Summary
2: N. Courtenay Pkwy & S.R. 528 EB on-off Ramps

3-2027 BUILD PM PEAK HOUR

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	472	0	812	0	0	0	0	1428	315	396	1318	0
Future Volume (veh/h)	472	0	812	0	0	0	0	1428	315	396	1318	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	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
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1856	0	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	487	0	0				0	1472	0	408	1359	0
Peak Hour Factor	0.97	0.97	0.97				0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	0	2				0	2	2	2	2	0
Cap, veh/h	545	0					0	2585		390	2740	0
Arrive On Green	0.16	0.00	0.00				0.00	1.00	0.00	0.44	1.00	0.00
Sat Flow, veh/h	3428	0	2790				0	5274	1585	1781	3647	0
Grp Volume(v), veh/h	487	0	0				0	1472	0	408	1359	0
Grp Sat Flow(s),veh/h/ln	1714	0	1395				0	1702	1585	1781	1777	0
Q Serve(g_s), s	23.7	0.0	0.0				0.0	0.0	0.0	37.2	0.0	0.0
Cycle Q Clear(g_c), s	23.7	0.0	0.0				0.0	0.0	0.0	37.2	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	545	0					0	2585		390	2740	0
V/C Ratio(X)	0.89	0.00					0.00	0.57		1.05	0.50	0.00
Avail Cap(c_a), veh/h	716	0					0	2585		390	2740	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	2.00	2.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	0.00	0.67	0.67	0.00
Uniform Delay (d), s/veh	70.1	0.0	0.0				0.0	0.0	0.0	47.8	0.0	0.0
Incr Delay (d2), s/veh	11.2	0.0	0.0				0.0	0.9	0.0	50.1	0.4	0.0
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	16.9	0.0	0.0				0.0	0.4	0.0	25.4	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	81.3	0.0	0.0				0.0	0.9	0.0	97.9	0.4	0.0
LnGrp LOS	F							A		F	A	
Approach Vol, veh/h		487						1472			1767	
Approach Delay, s/veh		81.3						0.9			22.9	
Approach LOS		F						A			C	
Timer - Assigned Phs	2		4		5		6					
Phs Duration (G+Y+Rc), s	138.5		31.5		45.0		93.5					
Change Period (Y+Rc), s	7.4		4.5		7.8		7.4					
Max Green Setting (Gmax), s	122.6		35.5		37.2		77.6					
Max Q Clear Time (g_c+l1), s	2.0		25.7		39.2		2.0					
Green Ext Time (p_c), s	23.3		1.4		0.0		23.8					
Intersection Summary												
HCM 7th Control Delay, s/veh			21.9									
HCM 7th LOS			C									
Notes												
Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.												

Synchro 12 Report

Lanes, Volumes, Timings

3-2027 BUILD PM PEAK HOUR

3: N. Courtenay Pkwy & S.R. 528 WB on-off Ramps

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	374	0	324	767	1189	0	0	1464	1134
Future Volume (vph)	0	0	0	374	0	324	767	1189	0	0	1464	1134
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	4%	3%	3%	2%	2%	2%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	394	0	341	807	1252	0	0	1541	1194
Turn Type				Prot		Perm	Prot	NA			NA	Perm
Protected Phases				3			1	6			2	
Permitted Phases						3						2
Detector Phase				3		3	1	6			2	2
Switch Phase												
Minimum Initial (s)				7.0		7.0	5.0	12.0			12.0	12.0
Minimum Split (s)				14.0		14.0	22.5	22.5			22.5	22.5
Total Split (s)				30.0		30.0	52.0	140.0			88.0	88.0
Total Split (%)				17.6%		17.6%	30.6%	82.4%			51.8%	51.8%
Maximum Green (s)				23.0		23.0	44.1	132.5			80.5	80.5
Yellow Time (s)				4.0		4.0	4.8	5.3			5.3	5.3
All-Red Time (s)				3.0		3.0	3.1	2.2			2.2	2.2
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				7.0		7.0	7.9	7.5			7.5	7.5
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0		3.0	3.0	3.0			4.0	4.0
Recall Mode				None		None	Min	C-Max			C-Max	C-Max
Act Effct Green (s)				23.0		23.0	44.1	132.5			80.5	80.5
Actuated g/C Ratio				0.14		0.14	0.26	0.78			0.47	0.47
v/c Ratio				0.85		1.06	0.91	0.46			0.64	1.26
Control Delay (s/veh)				89.0		106.4	67.3	8.1			35.3	154.2
Queue Delay				2.8		0.0	46.8	0.3			0.1	0.0
Total Delay (s/veh)				91.8		106.4	114.1	8.4			35.4	154.2
LOS				F		F	F	A			D	F
Approach Delay (s/veh)					98.6			49.8			87.3	
Approach LOS					F			D			F	
Queue Length 50th (ft)				224		~280	475	187			469	~1433
Queue Length 95th (ft)				#306		#495	#581	206			520	#1703
Internal Link Dist (ft)		690			789			365			641	
Turn Bay Length (ft)				150		275						90
Base Capacity (vph)				464		323	882	2731			2407	944
Starvation Cap Reductn				0		0	206	719			0	0
Spillback Cap Reductn				24		0	0	0			134	0
Storage Cap Reductn				0		0	0	0			0	0
Reduced v/c Ratio				0.90		1.06	1.19	0.62			0.68	1.26
Intersection Summary												
Cycle Length: 170												
Actuated Cycle Length: 170												
Offset: 62 (36%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow												
Natural Cycle: 150												

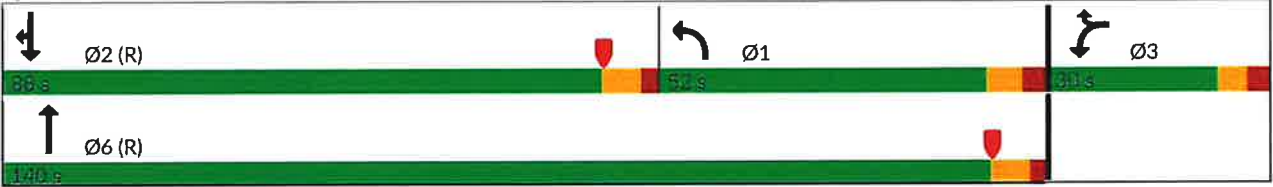
Synchro 12 Report

Lanes, Volumes, Timings
3: N. Courtenay Pkwy & S.R. 528 WB on-off Ramps

3-2027 BUILD PM PEAK HOUR

Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.26	
Intersection Signal Delay (s/veh): 74.8	Intersection LOS: E
Intersection Capacity Utilization 121.4%	ICU Level of Service H
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 3: N. Courtenay Pkwy & S.R. 528 WB on-off Ramps



HCM 7th Signalized Intersection Summary
3: N. Courtenay Pkwy & S.R. 528 WB on-off Ramps

3-2027 BUILD PM PEAK HOUR

	           											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	374	0	324	767	1189	0	0	1464	1134
Future Volume (veh/h)	0	0	0	374	0	324	767	1189	0	0	1464	1134
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Lane Width Adj.				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)				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
Work Zone On Approach				No				No				No
Adj Sat Flow, veh/h/ln				1870	0	1841	1856	1856	0	0	1870	1856
Adj Flow Rate, veh/h				394	0	225	807	1252	0	0	1541	994
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	0	4	3	3	0	0	2	3
Cap, veh/h				468	0	211	1164	3022	0	0	2418	745
Arrive On Green				0.14	0.00	0.14	0.68	1.00	0.00	0.00	0.47	0.47
Sat Flow, veh/h				3456	0	1560	3428	3618	0	0	5274	1572
Grp Volume(v), veh/h				394	0	225	807	1252	0	0	1541	994
Grp Sat Flow(s),veh/h/ln				1728	0	1560	1714	1763	0	0	1702	1572
Q Serve(g_s), s				18.9	0.0	23.0	24.3	0.0	0.0	0.0	38.7	59.0
Cycle Q Clear(g_c), s				18.9	0.0	23.0	24.3	0.0	0.0	0.0	38.7	59.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				468	0	211	1164	3022	0	0	2418	745
V/C Ratio(X)				0.84	0.00	1.07	0.69	0.41	0.00	0.00	0.64	1.33
Avail Cap(c_a), veh/h				468	0	211	1164	3022	0	0	2418	745
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.70	0.70	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				71.7	0.0	73.5	21.9	0.0	0.0	0.0	33.7	24.0
Incr Delay (d2), s/veh				13.1	0.0	80.5	1.3	0.3	0.0	0.0	1.3	159.8
Initial Q Delay(d3), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				14.0	0.0	20.4	9.8	0.2	0.0	0.0	22.5	78.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh				84.8	0.0	154.0	23.2	0.3	0.0	0.0	35.0	183.8
LnGrp LOS				F		F	C	A			D	F
Approach Vol, veh/h				619				2059				2535
Approach Delay, s/veh				110.0				9.3				93.4
Approach LOS				F				A				F
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	66.0	88.0				154.0		30.0				
Change Period (Y+Rc), s	7.9	7.5				* 7.9		7.0				
Max Green Setting (Gmax), s	44.1	80.5				* 1.3E+02		23.0				
Max Q Clear Time (g_c+I1), s	26.3	61.0				2.0		25.0				
Green Ext Time (p_c), s	2.9	17.1				11.9		0.0				
Intersection Summary												
HCM 7th Control Delay, s/veh			62.1									
HCM 7th LOS			E									
Notes												
* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.												

Synchro 12 Report

Lanes, Volumes, Timings

3-2027 BUILD PM PEAK HOUR

11: N. Courtenay Pkwy & Proposed Dwy 1

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	22	1788	36	0	1893
Future Volume (vph)	0	22	1788	36	0	1893
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	24	1982	0	0	2058
Sign Control	Stop		Free			Free
Intersection Summary						
Control Type: Unsignalized						
Intersection Capacity Utilization 60.6%	ICU Level of Service B					
Analysis Period (min) 15						