























## **APPENDIX B: LOS WORKSHEETS**



# HCM 6th Signalized Intersection Summary

## 1: Kuakini Hwy & Hualalai Rd

06/15/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	209	41	24	55	39	194	18	548	45	122	355	150
Future Volume (veh/h)	209	41	24	55	39	194	18	548	45	122	355	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		0.98	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	1453	1477	1870	1870	1477	1856	1870	1477	1870	1870	1477	1841
Adj Flow Rate, veh/h	220	43	17	58	41	69	19	577	0	128	374	53
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	2	2	2	2	3	2	2	2	2	2	4
Cap, veh/h	229	245	97	307	61	103	485	1454		488	808	853
Arrive On Green	0.17	0.24	0.23	0.05	0.13	0.11	0.03	0.52	0.00	0.06	0.55	0.55
Sat Flow, veh/h	1384	1005	398	1781	488	820	1781	2879	0	1781	1477	1559
Grp Volume(v), veh/h	220	0	60	58	0	110	19	577	0	128	374	53
Grp Sat Flow(s),veh/h/ln	1384	0	1403	1781	0	1308	1781	1403	0	1781	1477	1559
Q Serve(g_s), s	19.7	0.0	4.2	3.5	0.0	10.1	0.6	15.6	0.0	4.0	19.2	2.0
Cycle Q Clear(g_c), s	19.7	0.0	4.2	3.5	0.0	10.1	0.6	15.6	0.0	4.0	19.2	2.0
Prop In Lane	1.00		0.28	1.00		0.63	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	229	0	342	307	0	164	485	1454		488	808	853
V/C Ratio(X)	0.96	0.00	0.18	0.19	0.00	0.67	0.04	0.40		0.26	0.46	0.06
Avail Cap(c_a), veh/h	229	0	342	517	0	272	657	1454		608	808	853
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.7	0.0	37.5	44.4	0.0	52.6	14.1	18.3	0.0	13.0	17.2	13.3
Incr Delay (d2), s/veh	48.1	0.0	0.1	0.1	0.0	1.8	0.0	0.8	0.0	0.1	1.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.9	0.0	1.5	1.6	0.0	3.4	0.3	5.3	0.0	1.6	7.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	99.8	0.0	37.6	44.5	0.0	54.4	14.1	19.1	0.0	13.1	19.1	13.4
LnGrp LOS	F	A	D	D	A	D	B	B		B	B	B
Approach Vol, veh/h		280			168			596			555	
Approach Delay, s/veh		86.5			51.0			18.9			17.2	
Approach LOS		F			D			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.9	72.4	25.0	19.7	11.5	68.8	10.3	34.4				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	14.5	44.5	19.5	24.5	14.5	44.5	19.5	24.5				
Max Q Clear Time (g_c+I1), s	2.6	21.2	21.7	12.1	6.0	17.6	5.5	6.2				
Green Ext Time (p_c), s	0.0	1.8	0.0	0.2	0.1	2.4	0.0	0.1				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			33.5									
HCM 6th LOS			C									
<b>Notes</b>												
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th TWSC  
2: Kuakini Hwy & North Entrance

06/15/2023

Intersection						
Int Delay, s/veh	1.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↖		↖	↗
Traffic Vol, veh/h	11	51	507	66	98	284
Future Vol, veh/h	11	51	507	66	98	284
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	100	-	-	120	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	3	2	2	2
Mvmt Flow	13	61	604	79	117	338

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1216	646	0	0	683	0
Stage 1	644	-	-	-	-	-
Stage 2	572	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	200	472	-	-	910	-
Stage 1	523	-	-	-	-	-
Stage 2	565	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	174	471	-	-	910	-
Mov Cap-2 Maneuver	174	-	-	-	-	-
Stage 1	523	-	-	-	-	-
Stage 2	492	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.2	0	2.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	174	471	910	-
HCM Lane V/C Ratio	-	-	0.075	0.129	0.128	-
HCM Control Delay (s)	-	-	27.4	13.8	9.5	-
HCM Lane LOS	-	-	D	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.4	0.4	-

Intersection						
Int Delay, s/veh	4.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	54	66	164	12	24	109
Future Vol, veh/h	54	66	164	12	24	109
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	60	73	182	13	27	121

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	195	0	-	0	382 189
Stage 1	-	-	-	-	189 -
Stage 2	-	-	-	-	193 -
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	1378	-	-	-	620 853
Stage 1	-	-	-	-	843 -
Stage 2	-	-	-	-	840 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1378	-	-	-	593 853
Mov Cap-2 Maneuver	-	-	-	-	593 -
Stage 1	-	-	-	-	806 -
Stage 2	-	-	-	-	840 -

Approach	EB	WB	SB
HCM Control Delay, s	3.5	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1378	-	-	-	790
HCM Lane V/C Ratio	0.044	-	-	-	0.187
HCM Control Delay (s)	7.7	-	-	-	10.6
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.7

# HCM 6th Signalized Intersection Summary

## 4: Queen Kaahumanu Hwy & Nani Kailua Dr

06/15/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↑	↕	↕	↕	↕
Traffic Volume (veh/h)	48	19	17	55	58	164	30	1010	38	56	746	59
Future Volume (veh/h)	48	19	17	55	58	164	30	1010	38	56	746	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		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	1870	1477	1870	1870	1477	1856	1477	1259	1870	1477	1239	1870
Adj Flow Rate, veh/h	50	20	0	57	60	0	31	1052	0	58	777	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	3	2	4	2	2	6	2
Cap, veh/h	111	37		94	74		315	984		91	974	
Arrive On Green	0.11	0.11	0.00	0.11	0.11	0.00	0.03	0.78	0.00	0.03	0.79	0.00
Sat Flow, veh/h	647	323	1585	575	688	1572	1406	1259	1585	1406	1239	1585
Grp Volume(v), veh/h	70	0	0	117	0	0	31	1052	0	58	777	0
Grp Sat Flow(s),veh/h/ln	970	0	1585	1264	0	1572	1406	1259	1585	1406	1239	1585
Q Serve(g_s), s	0.0	0.0	0.0	3.1	0.0	0.0	0.7	126.5	0.0	1.4	58.3	0.0
Cycle Q Clear(g_c), s	11.6	0.0	0.0	14.8	0.0	0.0	0.7	126.5	0.0	1.4	58.3	0.0
Prop In Lane	0.71		1.00	0.49		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	148	0		168	0		315	984		91	974	
V/C Ratio(X)	0.47	0.00		0.70	0.00		0.10	1.07		0.64	0.80	
Avail Cap(c_a), veh/h	167	0		189	0		325	984		94	974	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	68.6	0.0	0.0	71.1	0.0	0.0	14.0	17.7	0.0	52.2	10.0	0.0
Incr Delay (d2), s/veh	2.3	0.0	0.0	9.3	0.0	0.0	0.1	49.2	0.0	12.9	4.7	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	0.0	5.3	0.0	0.0	0.4	41.7	0.0	2.1	13.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.0	0.0	0.0	80.4	0.0	0.0	14.1	66.9	0.0	65.0	14.7	0.0
LnGrp LOS	E	A		F	A		B	F		E	B	
Approach Vol, veh/h		70			117			1083			835	
Approach Delay, s/veh		71.0			80.4			65.4			18.2	
Approach LOS		E			F			E			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.9	130.8		22.3	9.7	130.0		22.3				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	4.5	124.5		19.5	4.5	124.5		19.5				
Max Q Clear Time (g_c+I1), s	2.7	60.3		16.8	3.4	128.5		13.6				
Green Ext Time (p_c), s	0.0	6.1		0.1	0.0	0.0		0.1				

### Intersection Summary

HCM 6th Ctrl Delay	47.7
HCM 6th LOS	D

### Notes

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

HCM 6th TWSC  
5: Driveway & Hualalai Rd

06/15/2023

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	4	71	4	4	174	7	14	0	3	3	0	3
Future Vol, veh/h	4	71	4	4	174	7	14	0	3	3	0	3
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	-	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	87	5	5	212	9	17	0	4	4	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	221	0	0	92	0	0	329	331	90	329	329	217
Stage 1	-	-	-	-	-	-	100	100	-	227	227	-
Stage 2	-	-	-	-	-	-	229	231	-	102	102	-
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	1348	-	-	1503	-	-	624	588	968	624	590	823
Stage 1	-	-	-	-	-	-	906	812	-	776	716	-
Stage 2	-	-	-	-	-	-	774	713	-	904	811	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1348	-	-	1503	-	-	618	584	968	618	586	823
Mov Cap-2 Maneuver	-	-	-	-	-	-	618	584	-	618	586	-
Stage 1	-	-	-	-	-	-	902	809	-	773	714	-
Stage 2	-	-	-	-	-	-	768	711	-	897	808	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			0.2			10.6			10.2		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	660	1348	-	-	1503	-	-	706
HCM Lane V/C Ratio	0.031	0.004	-	-	0.003	-	-	0.01
HCM Control Delay (s)	10.6	7.7	0	-	7.4	-	-	10.2
HCM Lane LOS	B	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	33	60	146	1080	795	23
Future Vol, veh/h	33	60	146	1080	795	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	130	0	420	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	3	6	2
Mvmt Flow	36	65	159	1174	864	25

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2356	-	864	0	-	0
Stage 1	864	-	-	-	-	-
Stage 2	1492	-	-	-	-	-
Critical Hdwy	6.42	-	4.13	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	2.227	-	-	-
Pot Cap-1 Maneuver	39	0	774	-	-	-
Stage 1	413	0	-	-	-	-
Stage 2	206	0	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 31	-	774	-	-	-
Mov Cap-2 Maneuver	166	-	-	-	-	-
Stage 1	328	-	-	-	-	-
Stage 2	206	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	32.6	1.3	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	774	-	166	-	-	-
HCM Lane V/C Ratio	0.205	-	0.216	-	-	-
HCM Control Delay (s)	10.8	-	32.6	0	-	-
HCM Lane LOS	B	-	D	A	-	-
HCM 95th %tile Q(veh)	0.8	-	0.8	-	-	-

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

HCM 6th TWSC  
7: Queen Kaahumanu Hwy & Kuakini Hwy

06/15/2023

Intersection						
Int Delay, s/veh	2.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	285	368	912	773	53
Future Vol, veh/h	10	285	368	912	773	53
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	150	0	450	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	4	4	6	2
Mvmt Flow	11	300	387	960	814	56

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	2549	-	815	0	0
Stage 1	815	-	-	-	-
Stage 2	1734	-	-	-	-
Critical Hdwy	6.42	-	4.14	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	-	2.236	-	-
Pot Cap-1 Maneuver	29	0	804	-	-
Stage 1	435	0	-	-	-
Stage 2	156	0	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	15	-	803	-	-
Mov Cap-2 Maneuver	120	-	-	-	-
Stage 1	225	-	-	-	-
Stage 2	156	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	37.9	3.9	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	803	-	120	-	-	-
HCM Lane V/C Ratio	0.482	-	0.088	-	-	-
HCM Control Delay (s)	13.6	-	37.9	0	-	-
HCM Lane LOS	B	-	E	A	-	-
HCM 95th %tile Q(veh)	2.7	-	0.3	-	-	-



# HCM 6th Signalized Intersection Summary

## 1: Kuakini Hwy & Hualalai Rd

06/15/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	153	24	25	63	38	165	24	541	52	161	729	244
Future Volume (veh/h)	153	24	25	63	38	165	24	541	52	161	729	244
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.98	1.00		1.00	1.00		0.96
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	1477	1477	1870	1870	1477	1870	1870	1477	1870	1870	1477	1870
Adj Flow Rate, veh/h	155	24	17	64	38	38	24	546	0	163	736	145
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	184	143	101	268	65	65	263	1685		581	926	958
Arrive On Green	0.13	0.18	0.17	0.05	0.10	0.09	0.03	0.60	0.00	0.06	0.63	0.63
Sat Flow, veh/h	1406	801	567	1781	668	668	1781	2879	0	1781	1477	1527
Grp Volume(v), veh/h	155	0	41	64	0	76	24	546	0	163	736	145
Grp Sat Flow(s),veh/h/ln	1406	0	1368	1781	0	1337	1781	1403	0	1781	1477	1527
Q Serve(g_s), s	15.6	0.0	3.7	4.6	0.0	7.9	0.7	14.0	0.0	4.9	53.7	5.7
Cycle Q Clear(g_c), s	15.6	0.0	3.7	4.6	0.0	7.9	0.7	14.0	0.0	4.9	53.7	5.7
Prop In Lane	1.00		0.41	1.00		0.50	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	184	0	244	268	0	131	263	1685		581	926	958
V/C Ratio(X)	0.84	0.00	0.17	0.24	0.00	0.58	0.09	0.32		0.28	0.79	0.15
Avail Cap(c_a), veh/h	249	0	293	494	0	286	464	1685		735	926	958
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.5	0.0	50.8	54.8	0.0	63.0	19.1	14.4	0.0	10.0	20.1	11.1
Incr Delay (d2), s/veh	17.1	0.0	0.1	0.2	0.0	1.5	0.1	0.5	0.0	0.1	7.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	0.0	1.3	2.1	0.0	2.8	0.3	4.7	0.0	1.9	19.9	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.6	0.0	50.9	55.0	0.0	64.5	19.1	14.9	0.0	10.0	27.1	11.5
LnGrp LOS	E	A	D	D	A	E	B	B		B	C	B
Approach Vol, veh/h		196			140			570			1044	
Approach Delay, s/veh		72.8			60.1			15.1			22.3	
Approach LOS		E			E			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.6	94.9	23.3	18.2	12.5	91.1	11.6	29.8				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	19.5	49.5	24.5	29.5	19.5	49.5	24.5	29.5				
Max Q Clear Time (g_c+I1), s	2.7	55.7	17.6	9.9	6.9	16.0	6.6	5.7				
Green Ext Time (p_c), s	0.0	0.0	0.2	0.2	0.1	2.3	0.0	0.1				

### Intersection Summary

HCM 6th Ctrl Delay	28.0
HCM 6th LOS	C

### Notes

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

HCM 6th TWSC  
2: Kuakini Hwy & North Entrance

06/15/2023

Intersection						
Int Delay, s/veh	1.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↖		↙	↗
Traffic Vol, veh/h	23	82	431	23	59	678
Future Vol, veh/h	23	82	431	23	59	678
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	100	-	-	120	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	87	459	24	63	721

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1320	473	0	0	485
Stage 1	473	-	-	-	-
Stage 2	847	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	173	591	-	-	1078
Stage 1	627	-	-	-	-
Stage 2	420	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	162	590	-	-	1076
Mov Cap-2 Maneuver	162	-	-	-	-
Stage 1	626	-	-	-	-
Stage 2	395	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.3	0	0.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	162	590	1076	-
HCM Lane V/C Ratio	-	-	0.151	0.148	0.058	-
HCM Control Delay (s)	-	-	31.1	12.2	8.6	-
HCM Lane LOS	-	-	D	B	A	-
HCM 95th %tile Q(veh)	-	-	0.5	0.5	0.2	-

Intersection						
Int Delay, s/veh	4.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	85	74	84	13	11	118
Future Vol, veh/h	85	74	84	13	11	118
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	3
Mvmt Flow	93	81	92	14	12	130

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	106	0	-	0	366 99
Stage 1	-	-	-	-	99 -
Stage 2	-	-	-	-	267 -
Critical Hdwy	4.12	-	-	-	6.42 6.23
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.327
Pot Cap-1 Maneuver	1485	-	-	-	634 954
Stage 1	-	-	-	-	925 -
Stage 2	-	-	-	-	778 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1485	-	-	-	594 954
Mov Cap-2 Maneuver	-	-	-	-	594 -
Stage 1	-	-	-	-	867 -
Stage 2	-	-	-	-	778 -

Approach	EB	WB	SB
HCM Control Delay, s	4.1	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1485	-	-	-	907
HCM Lane V/C Ratio	0.063	-	-	-	0.156
HCM Control Delay (s)	7.6	-	-	-	9.7
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.6

HCM 6th Signalized Intersection Summary  
 4: Queen Kaahumanu Hwy & Nani Kailua Dr

06/15/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (veh/h)	45	41	10	32	35	105	20	788	34	115	947	76
Future Volume (veh/h)	45	41	10	32	35	105	20	788	34	115	947	76
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		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	1870	1477	1870	1870	1477	1856	1477	1259	1870	1442	1280	1870
Adj Flow Rate, veh/h	49	45	0	35	38	0	22	857	0	125	1029	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	3	2	4	2	5	2	2
Cap, veh/h	91	62		77	67		81	995		262	1024	
Arrive On Green	0.10	0.10	0.00	0.09	0.09	0.00	0.03	0.79	0.00	0.04	0.80	0.00
Sat Flow, veh/h	569	625	1585	467	723	1572	1406	1259	1585	1373	1280	1585
Grp Volume(v), veh/h	94	0	0	73	0	0	22	857	0	125	1029	0
Grp Sat Flow(s),veh/h/ln	1193	0	1585	1190	0	1572	1406	1259	1585	1373	1280	1585
Q Serve(g_s), s	3.0	0.0	0.0	0.0	0.0	0.0	0.5	70.8	0.0	2.8	126.5	0.0
Cycle Q Clear(g_c), s	12.3	0.0	0.0	9.3	0.0	0.0	0.5	70.8	0.0	2.8	126.5	0.0
Prop In Lane	0.52		1.00	0.48		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	153	0		145	0		81	995		262	1024	
V/C Ratio(X)	0.61	0.00		0.50	0.00		0.27	0.86		0.48	1.00	
Avail Cap(c_a), veh/h	195	0		186	0		96	1008		262	1024	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	69.6	0.0	0.0	68.9	0.0	0.0	51.5	10.9	0.0	24.0	15.8	0.0
Incr Delay (d2), s/veh	3.9	0.0	0.0	2.7	0.0	0.0	1.8	7.7	0.0	1.3	29.2	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	0.0	0.0	3.0	0.0	0.0	0.7	17.4	0.0	2.8	35.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.5	0.0	0.0	71.6	0.0	0.0	53.3	18.6	0.0	25.3	45.0	0.0
LnGrp LOS	E	A		E	A		D	B		C	F	
Approach Vol, veh/h		94			73			879			1154	
Approach Delay, s/veh		73.5			71.6			19.5			42.8	
Approach LOS		E			E			B			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.3	130.0		19.7	10.0	128.3		19.7				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	4.5	124.5		19.5	4.5	124.5		19.5				
Max Q Clear Time (g_c+I1), s	2.5	128.5		11.3	4.8	72.8		14.3				
Green Ext Time (p_c), s	0.0	0.0		0.2	0.0	7.1		0.2				

Intersection Summary

HCM 6th Ctrl Delay	35.8
HCM 6th LOS	D

Notes

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

HCM 6th TWSC  
5: Driveway & Hualalai Rd

06/15/2023

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	5	89	18	7	86	1	12	0	2	3	0	2
Future Vol, veh/h	5	89	18	7	86	1	12	0	2	3	0	2
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	-	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	107	22	8	104	1	14	0	2	4	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	105	0	0	129	0	0	252	251	118	252	262	105
Stage 1	-	-	-	-	-	-	130	130	-	121	121	-
Stage 2	-	-	-	-	-	-	122	121	-	131	141	-
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	1486	-	-	1457	-	-	701	652	934	701	643	949
Stage 1	-	-	-	-	-	-	874	789	-	883	796	-
Stage 2	-	-	-	-	-	-	882	796	-	873	780	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1486	-	-	1457	-	-	694	646	934	694	637	949
Mov Cap-2 Maneuver	-	-	-	-	-	-	694	646	-	694	637	-
Stage 1	-	-	-	-	-	-	871	786	-	879	792	-
Stage 2	-	-	-	-	-	-	875	792	-	867	777	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0.6			10.1			9.7		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	720	1486	-	-	1457	-	-	778
HCM Lane V/C Ratio	0.023	0.004	-	-	0.006	-	-	0.008
HCM Control Delay (s)	10.1	7.4	0	-	7.5	-	-	9.7
HCM Lane LOS	B	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

HCM 6th TWSC  
6: Queen Kaahumanu Hwy & Hualalai Rd

06/15/2023

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	13	80	66	826	969	16
Future Vol, veh/h	13	80	66	826	969	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	130	0	420	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	4	3	2
Mvmt Flow	14	86	71	888	1042	17

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2072	-	1042	0	-	0
Stage 1	1042	-	-	-	-	-
Stage 2	1030	-	-	-	-	-
Critical Hdwy	6.42	-	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	2.218	-	-	-
Pot Cap-1 Maneuver	59	0	667	-	-	-
Stage 1	340	0	-	-	-	-
Stage 2	344	0	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	53	-	667	-	-	-
Mov Cap-2 Maneuver	221	-	-	-	-	-
Stage 1	304	-	-	-	-	-
Stage 2	344	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.4	0.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	667	-	221	-	-	-
HCM Lane V/C Ratio	0.106	-	0.063	-	-	-
HCM Control Delay (s)	11	-	22.4	0	-	-
HCM Lane LOS	B	-	C	A	-	-
HCM 95th %tile Q(veh)	0.4	-	0.2	-	-	-

HCM 6th TWSC  
7: Queen Kaahumanu Hwy & Kuakini Hwy

06/15/2023

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	16	685	237	780	845	29
Future Vol, veh/h	16	685	237	780	845	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	150	0	450	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	3	3	2
Mvmt Flow	17	714	247	813	880	30

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2187	-	880	0	-	0
Stage 1	880	-	-	-	-	-
Stage 2	1307	-	-	-	-	-
Critical Hdwy	6.42	-	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	2.218	-	-	-
Pot Cap-1 Maneuver	50	0	768	-	-	-
Stage 1	406	0	-	-	-	-
Stage 2	253	0	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	34	-	768	-	-	-
Mov Cap-2 Maneuver	177	-	-	-	-	-
Stage 1	275	-	-	-	-	-
Stage 2	253	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	27.4	2.8	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	768	-	177	-	-	-
HCM Lane V/C Ratio	0.321	-	0.094	-	-	-
HCM Control Delay (s)	11.9	-	27.4	0	-	-
HCM Lane LOS	B	-	D	A	-	-
HCM 95th %tile Q(veh)	1.4	-	0.3	-	-	-

# HCM 6th Signalized Intersection Summary

## 1: Kuakini Hwy & Hualalai Rd

06/15/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	226	44	26	59	42	210	19	612	48	132	389	162
Future Volume (veh/h)	226	44	26	59	42	210	19	612	48	132	389	162
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		0.98	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	1453	1477	1870	1870	1477	1856	1870	1477	1870	1870	1477	1841
Adj Flow Rate, veh/h	238	46	19	62	44	86	20	644	0	139	409	66
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	2	2	2	2	3	2	2	2	2	2	4
Cap, veh/h	229	252	104	327	61	119	434	1406		443	788	831
Arrive On Green	0.17	0.25	0.24	0.05	0.14	0.13	0.03	0.50	0.00	0.06	0.53	0.53
Sat Flow, veh/h	1384	991	409	1781	441	861	1781	2879	0	1781	1477	1558
Grp Volume(v), veh/h	238	0	65	62	0	130	20	644	0	139	409	66
Grp Sat Flow(s),veh/h/ln	1384	0	1401	1781	0	1302	1781	1403	0	1781	1477	1558
Q Serve(g_s), s	20.7	0.0	4.6	3.7	0.0	12.0	0.7	18.6	0.0	4.5	22.3	2.6
Cycle Q Clear(g_c), s	20.7	0.0	4.6	3.7	0.0	12.0	0.7	18.6	0.0	4.5	22.3	2.6
Prop In Lane	1.00		0.29	1.00		0.66	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	229	0	356	327	0	180	434	1406		443	788	831
V/C Ratio(X)	1.04	0.00	0.18	0.19	0.00	0.72	0.05	0.46		0.31	0.52	0.08
Avail Cap(c_a), veh/h	229	0	356	533	0	271	605	1406		557	788	831
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.1	0.0	36.6	42.9	0.0	52.0	15.4	20.2	0.0	14.3	18.8	14.2
Incr Delay (d2), s/veh	69.8	0.0	0.1	0.1	0.0	2.0	0.0	1.1	0.0	0.1	2.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.7	0.0	1.6	1.7	0.0	4.1	0.3	6.3	0.0	1.8	8.2	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	122.0	0.0	36.7	43.0	0.0	54.0	15.4	21.3	0.0	14.4	21.3	14.4
LnGrp LOS	F	A	D	D	A	D	B	C		B	C	B
Approach Vol, veh/h		303			192			664			614	
Approach Delay, s/veh		103.7			50.5			21.1			19.0	
Approach LOS		F			D			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	70.7	25.0	21.3	12.0	66.7	10.5	35.8				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	14.5	44.5	19.5	24.5	14.5	44.5	19.5	24.5				
Max Q Clear Time (g_c+I1), s	2.7	24.3	22.7	14.0	6.5	20.6	5.7	6.6				
Green Ext Time (p_c), s	0.0	2.0	0.0	0.3	0.1	2.7	0.0	0.1				

### Intersection Summary

HCM 6th Ctrl Delay	37.7
HCM 6th LOS	D

### Notes

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



HCM 6th TWSC  
 2: Kuakini Hwy & North Entrance

06/15/2023

Intersection						
Int Delay, s/veh	1.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶	↷	↶		↶	↷
Traffic Vol, veh/h	11	51	571	66	98	320
Future Vol, veh/h	11	51	571	66	98	320
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	100	-	-	120	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	3	2	2	2
Mvmt Flow	13	61	680	79	117	381

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1335	722	0	0	759
Stage 1	720	-	-	-	-
Stage 2	615	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	169	427	-	-	852
Stage 1	482	-	-	-	-
Stage 2	539	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	146	426	-	-	852
Mov Cap-2 Maneuver	146	-	-	-	-
Stage 1	482	-	-	-	-
Stage 2	465	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18	0	2.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	146	426	852
HCM Lane V/C Ratio	-	-	0.09	0.143	0.137
HCM Control Delay (s)	-	-	32.1	14.9	9.9
HCM Lane LOS	-	-	D	B	A
HCM 95th %tile Q(veh)	-	-	0.3	0.5	0.5

Intersection						
Int Delay, s/veh	4.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	58	71	178	13	26	117
Future Vol, veh/h	58	71	178	13	26	117
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	64	79	198	14	29	130

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	212	0	-	0	412
Stage 1	-	-	-	-	205
Stage 2	-	-	-	-	207
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	1358	-	-	-	596
Stage 1	-	-	-	-	829
Stage 2	-	-	-	-	828
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1358	-	-	-	568
Mov Cap-2 Maneuver	-	-	-	-	568
Stage 1	-	-	-	-	790
Stage 2	-	-	-	-	828

Approach	EB	WB	SB
HCM Control Delay, s	3.5	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1358	-	-	-	770
HCM Lane V/C Ratio	0.047	-	-	-	0.206
HCM Control Delay (s)	7.8	-	-	-	10.9
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.8

HCM 6th Signalized Intersection Summary  
 4: Queen Kaahumanu Hwy & Nani Kailua Dr

06/15/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗	↗	↑	↗	↗	↑	↗
Traffic Volume (veh/h)	56	22	20	64	67	192	35	1231	45	66	909	69
Future Volume (veh/h)	56	22	20	64	67	192	35	1231	45	66	909	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		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	1870	1477	1870	1870	1477	1856	1477	1259	1870	1477	1239	1870
Adj Flow Rate, veh/h	58	23	0	67	70	0	36	1282	0	69	947	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	3	2	4	2	2	6	2
Cap, veh/h	119	39		104	81		96	963		93	955	
Arrive On Green	0.13	0.13	0.00	0.12	0.12	0.00	0.03	0.76	0.00	0.04	0.77	0.00
Sat Flow, veh/h	634	307	1585	586	667	1572	1406	1259	1585	1406	1239	1585
Grp Volume(v), veh/h	81	0	0	137	0	0	36	1282	0	69	947	0
Grp Sat Flow(s),veh/h/ln	941	0	1585	1253	0	1572	1406	1259	1585	1406	1239	1585
Q Serve(g_s), s	0.0	0.0	0.0	3.7	0.0	0.0	0.9	125.5	0.0	2.8	122.0	0.0
Cycle Q Clear(g_c), s	14.0	0.0	0.0	17.7	0.0	0.0	0.9	125.5	0.0	2.8	122.0	0.0
Prop In Lane	0.72		1.00	0.49		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	158	0		185	0		96	963		93	955	
V/C Ratio(X)	0.51	0.00		0.74	0.00		0.38	1.33		0.74	0.99	
Avail Cap(c_a), veh/h	158	0		185	0		112	963		101	955	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	68.2	0.0	0.0	71.0	0.0	0.0	50.6	19.3	0.0	55.4	18.3	0.0
Incr Delay (d2), s/veh	2.8	0.0	0.0	14.5	0.0	0.0	2.4	156.1	0.0	22.8	27.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.0	0.0	6.5	0.0	0.0	1.2	71.1	0.0	3.4	34.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.0	0.0	0.0	85.5	0.0	0.0	53.0	175.4	0.0	78.2	45.3	0.0
LnGrp LOS	E	A		F	A		D	F		E	D	
Approach Vol, veh/h		81			137			1318			1016	
Approach Delay, s/veh		71.0			85.5			172.0			47.5	
Approach LOS		E			F			F			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.1	130.0		25.0	10.1	129.0		25.0				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	5.5	123.5		19.5	5.5	123.5		19.5				
Max Q Clear Time (g_c+I1), s	2.9	124.0		19.7	4.8	127.5		16.0				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.1				

Intersection Summary

HCM 6th Ctrl Delay	114.6
HCM 6th LOS	F

Notes

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

HCM 6th TWSC  
5: Driveway & Hualalai Rd

06/15/2023

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	4	77	4	4	188	8	15	0	3	3	0	3
Future Vol, veh/h	4	77	4	4	188	8	15	0	3	3	0	3
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	-	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	94	5	5	229	10	18	0	4	4	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	239	0	0	99	0	0	353	356	97	353	353	234
Stage 1	-	-	-	-	-	-	107	107	-	244	244	-
Stage 2	-	-	-	-	-	-	246	249	-	109	109	-
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	1328	-	-	1494	-	-	602	570	959	602	572	805
Stage 1	-	-	-	-	-	-	898	807	-	760	704	-
Stage 2	-	-	-	-	-	-	758	701	-	896	805	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1328	-	-	1494	-	-	596	566	959	597	568	805
Mov Cap-2 Maneuver	-	-	-	-	-	-	596	566	-	597	568	-
Stage 1	-	-	-	-	-	-	894	804	-	757	702	-
Stage 2	-	-	-	-	-	-	752	699	-	889	802	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.1	10.9	10.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	636	1328	-	-	1494	-	-	686
HCM Lane V/C Ratio	0.035	0.004	-	-	0.003	-	-	0.011
HCM Control Delay (s)	10.9	7.7	0	-	7.4	-	-	10.3
HCM Lane LOS	B	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	36	65	158	1316	969	25
Future Vol, veh/h	36	65	158	1316	969	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	130	0	420	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	3	6	2
Mvmt Flow	39	71	172	1430	1053	27

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	2827	-	1053	0	0
Stage 1	1053	-	-	-	-
Stage 2	1774	-	-	-	-
Critical Hdwy	6.42	-	4.13	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	-	2.227	-	-
Pot Cap-1 Maneuver	~ 20	0	657	-	-
Stage 1	336	0	-	-	-
Stage 2	149	0	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	~ 15	-	657	-	-
Mov Cap-2 Maneuver	119	-	-	-	-
Stage 1	248	-	-	-	-
Stage 2	149	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	49.4	1.3	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	657	-	119	-	-	-
HCM Lane V/C Ratio	0.261	-	0.329	-	-	-
HCM Control Delay (s)	12.4	-	49.4	0	-	-
HCM Lane LOS	B	-	E	A	-	-
HCM 95th %tile Q(veh)	1	-	1.3	-	-	-

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

HCM 6th TWSC  
7: Queen Kaahumanu Hwy & Kuakini Hwy

06/15/2023

Intersection						
Int Delay, s/veh	3.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	11	308	408	1111	942	57
Future Vol, veh/h	11	308	408	1111	942	57
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	150	0	450	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	4	4	6	2
Mvmt Flow	12	324	429	1169	992	60

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	3020	-	993	0	-	0
Stage 1	993	-	-	-	-	-
Stage 2	2027	-	-	-	-	-
Critical Hdwy	6.42	-	4.14	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	2.236	-	-	-
Pot Cap-1 Maneuver	15	0	689	-	-	-
Stage 1	359	0	-	-	-	-
Stage 2	111	0	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 6	-	688	-	-	-
Mov Cap-2 Maneuver	79	-	-	-	-	-
Stage 1	135	-	-	-	-	-
Stage 2	111	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	58.2	5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	688	-	79	-	-	-
HCM Lane V/C Ratio	0.624	-	0.147	-	-	-
HCM Control Delay (s)	18.5	-	58.2	0	-	-
HCM Lane LOS	C	-	F	A	-	-
HCM 95th %tile Q(veh)	4.4	-	0.5	-	-	-

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

# HCM 6th Signalized Intersection Summary

## 1: Kuakini Hwy & Hualalai Rd

06/15/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	166	26	27	68	41	179	26	600	56	174	815	264
Future Volume (veh/h)	166	26	27	68	41	179	26	600	56	174	815	264
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.98	1.00		1.00	1.00		0.96
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	1477	1477	1870	1870	1477	1870	1870	1477	1870	1870	1575	1870
Adj Flow Rate, veh/h	168	26	19	69	41	52	26	606	0	176	823	166
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	197	154	113	287	63	80	203	1615		530	955	925
Arrive On Green	0.14	0.20	0.19	0.05	0.11	0.10	0.03	0.58	0.00	0.06	0.61	0.61
Sat Flow, veh/h	1406	790	577	1781	584	740	1781	2879	0	1781	1575	1526
Grp Volume(v), veh/h	168	0	45	69	0	93	26	606	0	176	823	166
Grp Sat Flow(s),veh/h/ln	1406	0	1367	1781	0	1324	1781	1403	0	1781	1575	1526
Q Serve(g_s), s	16.9	0.0	4.0	4.9	0.0	9.8	0.9	17.0	0.0	5.6	62.5	7.0
Cycle Q Clear(g_c), s	16.9	0.0	4.0	4.9	0.0	9.8	0.9	17.0	0.0	5.6	62.5	7.0
Prop In Lane	1.00		0.42	1.00		0.56	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	197	0	267	287	0	144	203	1615		530	955	925
V/C Ratio(X)	0.85	0.00	0.17	0.24	0.00	0.65	0.13	0.38		0.33	0.86	0.18
Avail Cap(c_a), veh/h	249	0	292	508	0	283	403	1615		675	955	925
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.9	0.0	48.8	53.3	0.0	62.4	23.7	16.7	0.0	11.5	23.5	12.6
Incr Delay (d2), s/veh	20.0	0.0	0.1	0.2	0.0	1.8	0.1	0.7	0.0	0.1	10.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	0.0	1.4	2.2	0.0	3.4	0.4	5.7	0.0	2.3	25.4	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	80.9	0.0	48.9	53.4	0.0	64.2	23.8	17.3	0.0	11.6	33.6	13.0
LnGrp LOS	F	A	D	D	A	E	C	B		B	C	B
Approach Vol, veh/h		213			162			632				1165
Approach Delay, s/veh		74.1			59.6			17.6				27.4
Approach LOS		E			E			B				C
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.7	91.9	24.6	19.7	13.2	87.5	12.0	32.3				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	19.5	49.5	24.5	29.5	19.5	49.5	24.5	29.5				
Max Q Clear Time (g_c+I1), s	2.9	64.5	18.9	11.8	7.6	19.0	6.9	6.0				
Green Ext Time (p_c), s	0.0	0.0	0.2	0.2	0.1	2.6	0.0	0.1				

### Intersection Summary

HCM 6th Ctrl Delay	31.5
HCM 6th LOS	C

### Notes

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

HCM 6th TWSC  
2: Kuakini Hwy & North Entrance

06/15/2023

Intersection						
Int Delay, s/veh	1.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	23	82	486	23	59	764
Future Vol, veh/h	23	82	486	23	59	764
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	100	-	-	120	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	87	517	24	63	813

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1470	531	0	0	543
Stage 1	531	-	-	-	-
Stage 2	939	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	140	548	-	-	1026
Stage 1	590	-	-	-	-
Stage 2	380	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	131	547	-	-	1024
Mov Cap-2 Maneuver	131	-	-	-	-
Stage 1	589	-	-	-	-
Stage 2	356	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.5	0	0.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	131	547	1024	-
HCM Lane V/C Ratio	-	-	0.187	0.159	0.061	-
HCM Control Delay (s)	-	-	38.7	12.8	8.7	-
HCM Lane LOS	-	-	E	B	A	-
HCM 95th %tile Q(veh)	-	-	0.7	0.6	0.2	-



Intersection						
Int Delay, s/veh	5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	92	80	91	14	12	127
Future Vol, veh/h	92	80	91	14	12	127
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	3
Mvmt Flow	101	88	100	15	13	140

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	115	0	-	0	398 108
Stage 1	-	-	-	-	108 -
Stage 2	-	-	-	-	290 -
Critical Hdwy	4.12	-	-	-	6.42 6.23
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.327
Pot Cap-1 Maneuver	1474	-	-	-	607 943
Stage 1	-	-	-	-	916 -
Stage 2	-	-	-	-	759 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1474	-	-	-	565 943
Mov Cap-2 Maneuver	-	-	-	-	565 -
Stage 1	-	-	-	-	853 -
Stage 2	-	-	-	-	759 -

Approach	EB	WB	SB
HCM Control Delay, s	4.1	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1474	-	-	-	892
HCM Lane V/C Ratio	0.069	-	-	-	0.171
HCM Control Delay (s)	7.6	-	-	-	9.9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.6

HCM 6th Signalized Intersection Summary  
 4: Queen Kaahumanu Hwy & Nani Kailua Dr

06/15/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗	↗	↑	↗	↗	↑	↗
Traffic Volume (veh/h)	52	47	12	37	40	123	23	960	40	135	1154	89
Future Volume (veh/h)	52	47	12	37	40	123	23	960	40	135	1154	89
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		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	1870	1870	1870	1870	1870	1856	1477	1259	1870	1442	1280	1870
Adj Flow Rate, veh/h	57	51	0	40	43	0	25	1043	0	147	1254	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	3	2	4	2	5	2	2
Cap, veh/h	106	69		88	77		83	1002		95	1030	
Arrive On Green	0.09	0.09	0.00	0.09	0.09	0.00	0.03	0.80	0.00	0.04	0.81	0.00
Sat Flow, veh/h	762	736	1585	623	881	1572	1406	1259	1585	1373	1280	1585
Grp Volume(v), veh/h	108	0	0	83	0	0	25	1043	0	147	1254	0
Grp Sat Flow(s),veh/h/ln	1498	0	1585	1504	0	1572	1406	1259	1585	1373	1280	1585
Q Serve(g_s), s	2.9	0.0	0.0	0.0	0.0	0.0	0.5	126.5	0.0	5.7	128.0	0.0
Cycle Q Clear(g_c), s	11.4	0.0	0.0	8.4	0.0	0.0	0.5	126.5	0.0	5.7	128.0	0.0
Prop In Lane	0.53		1.00	0.48		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	176	0		166	0		83	1002		95	1030	
V/C Ratio(X)	0.61	0.00		0.50	0.00		0.30	1.04		1.56	1.22	
Avail Cap(c_a), veh/h	235	0		226	0		96	1002		95	1030	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	70.4	0.0	0.0	69.8	0.0	0.0	52.4	16.2	0.0	62.1	15.5	0.0
Incr Delay (d2), s/veh	3.5	0.0	0.0	2.3	0.0	0.0	2.0	39.6	0.0	295.0	106.6	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	0.0	0.0	3.4	0.0	0.0	0.8	37.8	0.0	11.6	57.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.9	0.0	0.0	72.1	0.0	0.0	54.4	55.8	0.0	357.1	122.1	0.0
LnGrp LOS	E	A		E	A		D	F		F	F	
Approach Vol, veh/h		108			83			1068			1401	
Approach Delay, s/veh		73.9			72.1			55.8			146.8	
Approach LOS		E			E			E			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.5	131.5		19.0	10.0	130.0		19.0				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	4.5	124.5		19.5	4.5	124.5		19.5				
Max Q Clear Time (g_c+I1), s	2.5	130.0		10.4	7.7	128.5		13.4				
Green Ext Time (p_c), s	0.0	0.0		0.2	0.0	0.0		0.2				

Intersection Summary

HCM 6th Ctrl Delay	105.0
HCM 6th LOS	F

Notes

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

HCM 6th TWSC  
5: Driveway & Hualalai Rd

06/15/2023

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	5	96	19	8	93	1	13	0	2	3	0	2
Future Vol, veh/h	5	96	19	8	93	1	13	0	2	3	0	2
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	-	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	116	23	10	112	1	16	0	2	4	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	113	0	0	139	0	0	274	273	128	274	284	113
Stage 1	-	-	-	-	-	-	140	140	-	133	133	-
Stage 2	-	-	-	-	-	-	134	133	-	141	151	-
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	1476	-	-	1445	-	-	678	634	922	678	625	940
Stage 1	-	-	-	-	-	-	863	781	-	870	786	-
Stage 2	-	-	-	-	-	-	869	786	-	862	772	-
Platoon blocked, %		-	-	-	-	-						
Mov Cap-1 Maneuver	1476	-	-	1445	-	-	671	627	922	671	618	940
Mov Cap-2 Maneuver	-	-	-	-	-	-	671	627	-	671	618	-
Stage 1	-	-	-	-	-	-	860	778	-	867	780	-
Stage 2	-	-	-	-	-	-	861	780	-	856	769	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0.6			10.3			9.8		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	696	1476	-	-	1445	-	-	758
HCM Lane V/C Ratio	0.026	0.004	-	-	0.007	-	-	0.008
HCM Control Delay (s)	10.3	7.4	0	-	7.5	-	-	9.8
HCM Lane LOS	B	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

HCM 6th TWSC  
6: Queen Kaahumanu Hwy & Hualalai Rd

06/15/2023

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↗	↗	↗
Traffic Vol, veh/h	14	87	71	1006	1181	17
Future Vol, veh/h	14	87	71	1006	1181	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	130	0	420	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	4	3	2
Mvmt Flow	15	94	76	1082	1270	18

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2504	-	1270	0	-	0
Stage 1	1270	-	-	-	-	-
Stage 2	1234	-	-	-	-	-
Critical Hdwy	6.42	-	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	2.218	-	-	-
Pot Cap-1 Maneuver	32	0	547	-	-	-
Stage 1	264	0	-	-	-	-
Stage 2	275	0	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	28	-	547	-	-	-
Mov Cap-2 Maneuver	166	-	-	-	-	-
Stage 1	227	-	-	-	-	-
Stage 2	275	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	28.8	0.8	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	547	-	166	-	-	-
HCM Lane V/C Ratio	0.14	-	0.091	-	-	-
HCM Control Delay (s)	12.6	-	28.8	0	-	-
HCM Lane LOS	B	-	D	A	-	-
HCM 95th %tile Q(veh)	0.5	-	0.3	-	-	-

HCM 6th TWSC  
7: Queen Kaahumanu Hwy & Kuakini Hwy

06/15/2023

Intersection						
Int Delay, s/veh	2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↘
Traffic Vol, veh/h	17	740	265	950	1030	31
Future Vol, veh/h	17	740	265	950	1030	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	150	0	450	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	3	3	2
Mvmt Flow	18	771	276	990	1073	32

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	2615	-	1073	0	0
Stage 1	1073	-	-	-	-
Stage 2	1542	-	-	-	-
Critical Hdwy	6.42	-	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	-	2.218	-	-
Pot Cap-1 Maneuver	27	0	650	-	-
Stage 1	328	0	-	-	-
Stage 2	194	0	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	~ 16	-	650	-	-
Mov Cap-2 Maneuver	126	-	-	-	-
Stage 1	189	-	-	-	-
Stage 2	194	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	38.2	3.2	0
HCM LOS	E		























Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	650	-	126	-	-	-
HCM Lane V/C Ratio	0.425	-	0.141	-	-	-
HCM Control Delay (s)	14.6	-	38.2	0	-	-
HCM Lane LOS	B	-	E	A	-	-
HCM 95th %tile Q(veh)	2.1	-	0.5	-	-	-

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

# HCM 6th Signalized Intersection Summary

## 1: Kuakini Hwy & Hualalai Rd

06/16/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	226	44	26	60	42	210	20	629	50	132	395	162
Future Volume (veh/h)	226	44	26	60	42	210	20	629	50	132	395	162
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		0.98	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	1453	1477	1870	1870	1477	1856	1870	1477	1870	1870	1477	1841
Adj Flow Rate, veh/h	238	46	19	63	44	86	21	662	0	139	416	66
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	2	2	2	2	3	2	2	2	2	2	4
Cap, veh/h	218	244	101	328	61	119	439	1430		442	798	843
Arrive On Green	0.16	0.25	0.23	0.05	0.14	0.13	0.03	0.51	0.00	0.06	0.54	0.54
Sat Flow, veh/h	1384	991	409	1781	441	861	1781	2879	0	1781	1477	1558
Grp Volume(v), veh/h	238	0	65	63	0	130	21	662	0	139	416	66
Grp Sat Flow(s),veh/h/ln	1384	0	1401	1781	0	1302	1781	1403	0	1781	1477	1558
Q Serve(g_s), s	19.7	0.0	4.6	3.7	0.0	12.0	0.7	18.9	0.0	4.4	22.5	2.5
Cycle Q Clear(g_c), s	19.7	0.0	4.6	3.7	0.0	12.0	0.7	18.9	0.0	4.4	22.5	2.5
Prop In Lane	1.00		0.29	1.00		0.66	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	218	0	344	328	0	180	439	1430		442	798	843
V/C Ratio(X)	1.09	0.00	0.19	0.19	0.00	0.72	0.05	0.46		0.31	0.52	0.08
Avail Cap(c_a), veh/h	218	0	344	519	0	271	608	1430		556	798	843
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.6	0.0	37.5	42.9	0.0	52.0	14.9	19.7	0.0	13.9	18.4	13.8
Incr Delay (d2), s/veh	87.4	0.0	0.1	0.1	0.0	2.0	0.0	1.1	0.0	0.1	2.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.2	0.0	1.6	1.7	0.0	4.1	0.3	6.4	0.0	1.8	8.2	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	140.0	0.0	37.6	43.0	0.0	54.0	15.0	20.7	0.0	14.1	20.8	14.0
LnGrp LOS	F	A	D	D	A	D	B	C		B	C	B
Approach Vol, veh/h		303			193			683			621	
Approach Delay, s/veh		118.1			50.4			20.6			18.6	
Approach LOS		F			D			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.1	71.6	24.0	21.3	11.9	67.7	10.6	34.7				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	14.5	45.5	18.5	24.5	14.5	45.5	18.5	24.5				
Max Q Clear Time (g_c+I1), s	2.7	24.5	21.7	14.0	6.4	20.9	5.7	6.6				
Green Ext Time (p_c), s	0.0	2.1	0.0	0.3	0.1	2.8	0.0	0.1				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				39.5								
HCM 6th LOS				D								
<b>Notes</b>												
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th TWSC  
 2: Kuakini Hwy & North Entrance

06/16/2023

Intersection						
Int Delay, s/veh	2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↖		↖	↗
Traffic Vol, veh/h	13	55	586	67	99	326
Future Vol, veh/h	13	55	586	67	99	326
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	100	-	-	120	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	3	2	2	2
Mvmt Flow	15	65	698	80	118	388

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1362	740	0	0	778	0
Stage 1	738	-	-	-	-	-
Stage 2	624	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	163	417	-	-	839	-
Stage 1	473	-	-	-	-	-
Stage 2	534	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	140	416	-	-	839	-
Mov Cap-2 Maneuver	140	-	-	-	-	-
Stage 1	473	-	-	-	-	-
Stage 2	459	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.9	0	2.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	140	416	839
HCM Lane V/C Ratio	-	-	0.111	0.157	0.14
HCM Control Delay (s)	-	-	33.9	15.3	10
HCM Lane LOS	-	-	D	C	A
HCM 95th %tile Q(veh)	-	-	0.4	0.6	0.5

Intersection						
Int Delay, s/veh	4.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	60	71	178	13	26	118
Future Vol, veh/h	60	71	178	13	26	118
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	67	79	198	14	29	131

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	212	0	-	0	418
Stage 1	-	-	-	-	205
Stage 2	-	-	-	-	213
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	1358	-	-	-	591
Stage 1	-	-	-	-	829
Stage 2	-	-	-	-	823
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1358	-	-	-	562
Mov Cap-2 Maneuver	-	-	-	-	562
Stage 1	-	-	-	-	788
Stage 2	-	-	-	-	823

Approach	EB	WB	SB
HCM Control Delay, s	3.6	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1358	-	-	-	768
HCM Lane V/C Ratio	0.049	-	-	-	0.208
HCM Control Delay (s)	7.8	-	-	-	10.9
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.8



HCM 6th Signalized Intersection Summary  
 4: Queen Kaahumanu Hwy & Nani Kailua Dr

06/16/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↑	↕	↕	↕	↕
Traffic Volume (veh/h)	57	23	20	64	67	192	35	1231	45	66	909	69
Future Volume (veh/h)	57	23	20	64	67	192	35	1231	45	66	909	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		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	1870	1477	1870	1870	1477	1856	1477	1259	1870	1477	1239	1870
Adj Flow Rate, veh/h	59	24	0	67	70	0	36	1282	0	69	947	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	3	2	4	2	2	6	2
Cap, veh/h	118	40		104	81		96	963		93	955	
Arrive On Green	0.13	0.13	0.00	0.12	0.12	0.00	0.03	0.76	0.00	0.04	0.77	0.00
Sat Flow, veh/h	629	313	1585	584	664	1572	1406	1259	1585	1406	1239	1585
Grp Volume(v), veh/h	83	0	0	137	0	0	36	1282	0	69	947	0
Grp Sat Flow(s),veh/h/ln	943	0	1585	1248	0	1572	1406	1259	1585	1406	1239	1585
Q Serve(g_s), s	0.0	0.0	0.0	3.5	0.0	0.0	0.9	125.5	0.0	2.8	122.0	0.0
Cycle Q Clear(g_c), s	14.3	0.0	0.0	17.8	0.0	0.0	0.9	125.5	0.0	2.8	122.0	0.0
Prop In Lane	0.71		1.00	0.49		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	158	0		185	0		96	963		93	955	
V/C Ratio(X)	0.52	0.00		0.74	0.00		0.38	1.33		0.74	0.99	
Avail Cap(c_a), veh/h	158	0		185	0		112	963		101	955	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	68.4	0.0	0.0	71.0	0.0	0.0	50.6	19.3	0.0	55.4	18.3	0.0
Incr Delay (d2), s/veh	3.2	0.0	0.0	14.7	0.0	0.0	2.4	156.1	0.0	22.8	27.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	0.0	6.5	0.0	0.0	1.2	71.1	0.0	3.4	34.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.5	0.0	0.0	85.7	0.0	0.0	53.0	175.4	0.0	78.2	45.3	0.0
LnGrp LOS	E	A		F	A		D	F		E	D	
Approach Vol, veh/h		83			137			1318			1016	
Approach Delay, s/veh		71.5			85.7			172.0			47.5	
Approach LOS		E			F			F			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.1	130.0		25.0	10.1	129.0		25.0				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	5.5	123.5		19.5	5.5	123.5		19.5				
Max Q Clear Time (g_c+I1), s	2.9	124.0		19.8	4.8	127.5		16.3				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.1				

Intersection Summary

HCM 6th Ctrl Delay	114.6
HCM 6th LOS	F

Notes

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

HCM 6th TWSC  
5: Driveway & Hualalai Rd

06/16/2023

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	4	77	4	4	188	8	15	0	3	3	0	3
Future Vol, veh/h	4	77	4	4	188	8	15	0	3	3	0	3
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	-	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	94	5	5	229	10	18	0	4	4	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	239	0	0	99	0	0	353	356	97	353	353	234
Stage 1	-	-	-	-	-	-	107	107	-	244	244	-
Stage 2	-	-	-	-	-	-	246	249	-	109	109	-
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	1328	-	-	1494	-	-	602	570	959	602	572	805
Stage 1	-	-	-	-	-	-	898	807	-	760	704	-
Stage 2	-	-	-	-	-	-	758	701	-	896	805	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1328	-	-	1494	-	-	596	566	959	597	568	805
Mov Cap-2 Maneuver	-	-	-	-	-	-	596	566	-	597	568	-
Stage 1	-	-	-	-	-	-	894	804	-	757	702	-
Stage 2	-	-	-	-	-	-	752	699	-	889	802	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			0.1			10.9			10.3		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	636	1328	-	-	1494	-	-	686
HCM Lane V/C Ratio	0.035	0.004	-	-	0.003	-	-	0.011
HCM Control Delay (s)	10.9	7.7	0	-	7.4	-	-	10.3
HCM Lane LOS	B	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

HCM 6th TWSC  
6: Queen Kaahumanu Hwy & Hualalai Rd

06/16/2023

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	36	65	158	1316	969	25
Future Vol, veh/h	36	65	158	1316	969	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	130	0	420	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	3	6	2
Mvmt Flow	39	71	172	1430	1053	27

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	2827	-	1053	0	-
Stage 1	1053	-	-	-	-
Stage 2	1774	-	-	-	-
Critical Hdwy	6.42	-	4.13	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	-	2.227	-	-
Pot Cap-1 Maneuver	~ 20	0	657	-	-
Stage 1	336	0	-	-	-
Stage 2	149	0	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	~ 15	-	657	-	-
Mov Cap-2 Maneuver	119	-	-	-	-
Stage 1	248	-	-	-	-
Stage 2	149	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	49.4	1.3	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	657	-	119	-	-	-
HCM Lane V/C Ratio	0.261	-	0.329	-	-	-
HCM Control Delay (s)	12.4	-	49.4	0	-	-
HCM Lane LOS	B	-	E	A	-	-
HCM 95th %tile Q(veh)	1	-	1.3	-	-	-

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

HCM 6th TWSC  
7: Queen Kaahumanu Hwy & Kuakini Hwy

06/16/2023

Intersection						
Int Delay, s/veh	3.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	12	317	411	1111	942	57
Future Vol, veh/h	12	317	411	1111	942	57
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	150	0	450	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	4	4	6	2
Mvmt Flow	13	334	433	1169	992	60

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	3028	-	993	0	-	0
Stage 1	993	-	-	-	-	-
Stage 2	2035	-	-	-	-	-
Critical Hdwy	6.42	-	4.14	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	2.236	-	-	-
Pot Cap-1 Maneuver	14	0	689	-	-	-
Stage 1	359	0	-	-	-	-
Stage 2	110	0	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 5	-	688	-	-	-
Mov Cap-2 Maneuver	78	-	-	-	-	-
Stage 1	133	-	-	-	-	-
Stage 2	110	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	59.9	5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	688	-	78	-	-	-
HCM Lane V/C Ratio	0.629	-	0.162	-	-	-
HCM Control Delay (s)	18.7	-	59.9	0	-	-
HCM Lane LOS	C	-	F	A	-	-
HCM 95th %tile Q(veh)	4.5	-	0.5	-	-	-

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

HCM 6th TWSC  
 9: Kuakini Hwy & South Entrance

06/16/2023

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶	↷	↶		↶	↷
Traffic Vol, veh/h	9	15	638	3	6	333
Future Vol, veh/h	9	15	638	3	6	333
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	0	-	-	0	-
Veh in Median Storage, #	2	-	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	10	16	693	3	7	362

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1071	695	0	0	696
Stage 1	695	-	-	-	-
Stage 2	376	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	244	442	-	-	900
Stage 1	495	-	-	-	-
Stage 2	694	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	242	442	-	-	900
Mov Cap-2 Maneuver	429	-	-	-	-
Stage 1	495	-	-	-	-
Stage 2	688	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.5	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	429	442	900
HCM Lane V/C Ratio	-	-	0.023	0.037	0.007
HCM Control Delay (s)	-	-	13.6	13.5	9
HCM Lane LOS	-	-	B	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	0

# HCM 6th Signalized Intersection Summary

## 1: Kuakini Hwy & Hualalai Rd

06/16/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	166	26	28	70	41	179	26	604	56	174	835	264
Future Volume (veh/h)	166	26	28	70	41	179	26	604	56	174	835	264
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.98	1.00		1.00	1.00		0.96
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	1477	1477	1870	1870	1477	1870	1870	1477	1870	1870	1575	1870
Adj Flow Rate, veh/h	168	26	20	71	41	52	26	610	0	176	843	166
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	197	150	115	289	63	80	189	1615		528	955	925
Arrive On Green	0.14	0.19	0.18	0.05	0.11	0.10	0.03	0.58	0.00	0.06	0.61	0.61
Sat Flow, veh/h	1406	771	593	1781	584	740	1781	2879	0	1781	1575	1526
Grp Volume(v), veh/h	168	0	46	71	0	93	26	610	0	176	843	166
Grp Sat Flow(s),veh/h/ln	1406	0	1364	1781	0	1324	1781	1403	0	1781	1575	1526
Q Serve(g_s), s	16.9	0.0	4.1	5.1	0.0	9.8	0.9	17.1	0.0	5.6	65.7	7.0
Cycle Q Clear(g_c), s	16.9	0.0	4.1	5.1	0.0	9.8	0.9	17.1	0.0	5.6	65.7	7.0
Prop In Lane	1.00		0.43	1.00		0.56	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	197	0	265	289	0	144	189	1615		528	955	925
V/C Ratio(X)	0.85	0.00	0.17	0.25	0.00	0.65	0.14	0.38		0.33	0.88	0.18
Avail Cap(c_a), veh/h	249	0	292	508	0	283	388	1615		673	955	925
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.9	0.0	49.0	53.2	0.0	62.4	25.1	16.7	0.0	11.5	24.2	12.6
Incr Delay (d2), s/veh	20.0	0.0	0.1	0.2	0.0	1.8	0.1	0.7	0.0	0.1	11.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	0.0	1.4	2.3	0.0	3.4	0.4	5.8	0.0	2.3	27.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	80.9	0.0	49.1	53.3	0.0	64.2	25.2	17.4	0.0	11.7	35.8	13.0
LnGrp LOS	F	A	D	D	A	E	C	B		B	D	B
Approach Vol, veh/h		214			164			636			1185	
Approach Delay, s/veh		74.0			59.5			17.7			29.0	
Approach LOS		E			E			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.7	91.9	24.6	19.7	13.2	87.5	12.2	32.2				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	19.5	49.5	24.5	29.5	19.5	49.5	24.5	29.5				
Max Q Clear Time (g_c+I1), s	2.9	67.7	18.9	11.8	7.6	19.1	7.1	6.1				
Green Ext Time (p_c), s	0.0	0.0	0.2	0.2	0.1	2.6	0.0	0.1				

### Intersection Summary

HCM 6th Ctrl Delay	32.4
HCM 6th LOS	C

### Notes

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

HCM 6th TWSC  
2: Kuakini Hwy & North Entrance

06/16/2023

Intersection						
Int Delay, s/veh	1.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↖		↖	↗
Traffic Vol, veh/h	24	83	490	26	64	782
Future Vol, veh/h	24	83	490	26	64	782
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	100	-	-	120	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	88	521	28	68	832

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1505	537	0	0	551	0
Stage 1	537	-	-	-	-	-
Stage 2	968	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	133	544	-	-	1019	-
Stage 1	586	-	-	-	-	-
Stage 2	368	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	124	543	-	-	1017	-
Mov Cap-2 Maneuver	124	-	-	-	-	-
Stage 1	585	-	-	-	-	-
Stage 2	343	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.3	0	0.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	124	543	1017	-
HCM Lane V/C Ratio	-	-	0.206	0.163	0.067	-
HCM Control Delay (s)	-	-	41.4	12.9	8.8	-
HCM Lane LOS	-	-	E	B	A	-
HCM 95th %tile Q(veh)	-	-	0.7	0.6	0.2	-

Intersection						
Int Delay, s/veh	5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	92	80	91	14	12	129
Future Vol, veh/h	92	80	91	14	12	129
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	3
Mvmt Flow	101	88	100	15	13	142

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	115	0	-	0	398 108
Stage 1	-	-	-	-	108 -
Stage 2	-	-	-	-	290 -
Critical Hdwy	4.12	-	-	-	6.42 6.23
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.327
Pot Cap-1 Maneuver	1474	-	-	-	607 943
Stage 1	-	-	-	-	916 -
Stage 2	-	-	-	-	759 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1474	-	-	-	565 943
Mov Cap-2 Maneuver	-	-	-	-	565 -
Stage 1	-	-	-	-	853 -
Stage 2	-	-	-	-	759 -

Approach	EB	WB	SB
HCM Control Delay, s	4.1	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1474	-	-	-	892
HCM Lane V/C Ratio	0.069	-	-	-	0.174
HCM Control Delay (s)	7.6	-	-	-	9.9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.6



# HCM 6th Signalized Intersection Summary

## 4: Queen Kaahumanu Hwy & Nani Kailua Dr

06/16/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↑	↕	↕	↕	↕
Traffic Volume (veh/h)	52	47	12	37	41	123	23	960	40	135	1154	90
Future Volume (veh/h)	52	47	12	37	41	123	23	960	40	135	1154	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		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	1870	1870	1870	1870	1870	1856	1477	1259	1870	1442	1280	1870
Adj Flow Rate, veh/h	57	51	0	40	45	0	25	1043	0	147	1254	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	3	2	4	2	5	2	2
Cap, veh/h	106	69		87	80		82	1002		94	1030	
Arrive On Green	0.09	0.09	0.00	0.09	0.09	0.00	0.03	0.80	0.00	0.04	0.80	0.00
Sat Flow, veh/h	755	732	1585	610	899	1572	1406	1259	1585	1373	1280	1585
Grp Volume(v), veh/h	108	0	0	85	0	0	25	1043	0	147	1254	0
Grp Sat Flow(s),veh/h/ln	1487	0	1585	1510	0	1572	1406	1259	1585	1373	1280	1585
Q Serve(g_s), s	2.8	0.0	0.0	0.0	0.0	0.0	0.5	126.5	0.0	5.7	128.0	0.0
Cycle Q Clear(g_c), s	11.5	0.0	0.0	8.6	0.0	0.0	0.5	126.5	0.0	5.7	128.0	0.0
Prop In Lane	0.53		1.00	0.47		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	176	0		167	0		82	1002		94	1030	
V/C Ratio(X)	0.62	0.00		0.51	0.00		0.30	1.04		1.56	1.22	
Avail Cap(c_a), veh/h	234	0		226	0		96	1002		94	1030	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	70.4	0.0	0.0	69.8	0.0	0.0	52.4	16.3	0.0	62.1	15.5	0.0
Incr Delay (d2), s/veh	3.5	0.0	0.0	2.4	0.0	0.0	2.0	39.8	0.0	295.5	107.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	0.0	0.0	3.5	0.0	0.0	0.8	37.9	0.0	11.6	57.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.9	0.0	0.0	72.2	0.0	0.0	54.4	56.1	0.0	357.6	122.5	0.0
LnGrp LOS	E	A		E	A		D	F		F	F	
Approach Vol, veh/h		108			85			1068			1401	
Approach Delay, s/veh		73.9			72.2			56.0			147.2	
Approach LOS		E			E			E			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.5	131.5		19.1	10.0	130.0		19.1				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	4.5	124.5		19.5	4.5	124.5		19.5				
Max Q Clear Time (g_c+I1), s	2.5	130.0		10.6	7.7	128.5		13.5				
Green Ext Time (p_c), s	0.0	0.0		0.2	0.0	0.0		0.2				

### Intersection Summary

HCM 6th Ctrl Delay	105.3
HCM 6th LOS	F

### Notes

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

HCM 6th TWSC  
5: Driveway & Hualalai Rd

06/16/2023

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	5	96	19	8	93	1	13	0	2	3	0	2
Future Vol, veh/h	5	96	19	8	93	1	13	0	2	3	0	2
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	-	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	116	23	10	112	1	16	0	2	4	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	113	0	0	139	0	0	274	273	128	274	284	113
Stage 1	-	-	-	-	-	-	140	140	-	133	133	-
Stage 2	-	-	-	-	-	-	134	133	-	141	151	-
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	1476	-	-	1445	-	-	678	634	922	678	625	940
Stage 1	-	-	-	-	-	-	863	781	-	870	786	-
Stage 2	-	-	-	-	-	-	869	786	-	862	772	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1476	-	-	1445	-	-	671	627	922	671	618	940
Mov Cap-2 Maneuver	-	-	-	-	-	-	671	627	-	671	618	-
Stage 1	-	-	-	-	-	-	860	778	-	867	780	-
Stage 2	-	-	-	-	-	-	861	780	-	856	769	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0.6			10.3			9.8		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	696	1476	-	-	1445	-	-	758
HCM Lane V/C Ratio	0.026	0.004	-	-	0.007	-	-	0.008
HCM Control Delay (s)	10.3	7.4	0	-	7.5	-	-	9.8
HCM Lane LOS	B	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	14	87	71	1006	1181	17
Future Vol, veh/h	14	87	71	1006	1181	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	130	0	420	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	4	3	2
Mvmt Flow	15	94	76	1082	1270	18

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2504	-	1270	0	-	0
Stage 1	1270	-	-	-	-	-
Stage 2	1234	-	-	-	-	-
Critical Hdwy	6.42	-	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	2.218	-	-	-
Pot Cap-1 Maneuver	32	0	547	-	-	-
Stage 1	264	0	-	-	-	-
Stage 2	275	0	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	28	-	547	-	-	-
Mov Cap-2 Maneuver	166	-	-	-	-	-
Stage 1	227	-	-	-	-	-
Stage 2	275	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	28.8	0.8	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	547	-	166	-	-	-
HCM Lane V/C Ratio	0.14	-	0.091	-	-	-
HCM Control Delay (s)	12.6	-	28.8	0	-	-
HCM Lane LOS	B	-	D	A	-	-
HCM 95th %tile Q(veh)	0.5	-	0.3	-	-	-

HCM 6th TWSC  
7: Queen Kaahumanu Hwy & Kuakini Hwy

06/16/2023

Intersection						
Int Delay, s/veh	2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↘
Traffic Vol, veh/h	17	742	276	950	1030	32
Future Vol, veh/h	17	742	276	950	1030	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	150	0	450	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	3	3	2
Mvmt Flow	18	773	288	990	1073	33

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	2639	-	1073	0	-
Stage 1	1073	-	-	-	-
Stage 2	1566	-	-	-	-
Critical Hdwy	6.42	-	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	-	2.218	-	-
Pot Cap-1 Maneuver	26	0	650	-	-
Stage 1	328	0	-	-	-
Stage 2	189	0	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	~ 14	-	650	-	-
Mov Cap-2 Maneuver	122	-	-	-	-
Stage 1	183	-	-	-	-
Stage 2	189	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	39.5	3.3	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	650	-	122	-	-	-
HCM Lane V/C Ratio	0.442	-	0.145	-	-	-
HCM Control Delay (s)	14.9	-	39.5	0	-	-
HCM Lane LOS	B	-	E	A	-	-
HCM 95th %tile Q(veh)	2.3	-	0.5	-	-	-

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

HCM 6th TWSC  
 9: Kuakini Hwy & South Entrance

06/16/2023

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↖		↙	↗
Traffic Vol, veh/h	2	4	512	11	18	788
Future Vol, veh/h	2	4	512	11	18	788
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	0	-	-	0	-
Veh in Median Storage, #	2	-	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	2	4	557	12	20	857

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1460	563	0	0	569
Stage 1	563	-	-	-	-
Stage 2	897	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	142	526	-	-	1003
Stage 1	570	-	-	-	-
Stage 2	398	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	139	526	-	-	1003
Mov Cap-2 Maneuver	328	-	-	-	-
Stage 1	570	-	-	-	-
Stage 2	390	-	-	-	-























Approach	WB	NB	SB
HCM Control Delay, s	13.3	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	328	526	1003
HCM Lane V/C Ratio	-	-	0.007	0.008	0.02
HCM Control Delay (s)	-	-	16	11.9	8.7
HCM Lane LOS	-	-	C	B	A
HCM 95th %tile Q(veh)	-	-	0	0	0.1

# HCM 6th Signalized Intersection Summary

## 1: Kuakini Hwy & Hualalai Rd

06/15/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	238	46	27	62	44	221	20	641	50	139	405	170
Future Volume (veh/h)	238	46	27	62	44	221	20	641	50	139	405	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		0.98	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	1453	1477	1870	1870	1477	1856	1870	1477	1870	1870	1477	1841
Adj Flow Rate, veh/h	251	48	20	65	46	98	21	675	0	146	426	74
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	2	2	2	2	3	2	2	2	2	2	4
Cap, veh/h	229	259	108	341	61	131	406	1373		421	773	816
Arrive On Green	0.17	0.26	0.25	0.05	0.15	0.14	0.03	0.49	0.00	0.06	0.52	0.52
Sat Flow, veh/h	1384	989	412	1781	415	884	1781	2879	0	1781	1477	1558
Grp Volume(v), veh/h	251	0	68	65	0	144	21	675	0	146	426	74
Grp Sat Flow(s),veh/h/ln	1384	0	1401	1781	0	1299	1781	1403	0	1781	1477	1558
Q Serve(g_s), s	20.7	0.0	4.7	3.8	0.0	13.3	0.7	20.2	0.0	4.8	24.1	3.0
Cycle Q Clear(g_c), s	20.7	0.0	4.7	3.8	0.0	13.3	0.7	20.2	0.0	4.8	24.1	3.0
Prop In Lane	1.00		0.29	1.00		0.68	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	229	0	367	341	0	192	406	1373		421	773	816
V/C Ratio(X)	1.10	0.00	0.19	0.19	0.00	0.75	0.05	0.49		0.35	0.55	0.09
Avail Cap(c_a), veh/h	229	0	367	545	0	270	576	1373		530	773	816
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.1	0.0	36.0	41.9	0.0	51.6	16.4	21.5	0.0	15.2	19.9	14.9
Incr Delay (d2), s/veh	87.2	0.0	0.1	0.1	0.0	3.8	0.0	1.3	0.0	0.2	2.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.8	0.0	1.7	1.7	0.0	4.6	0.3	6.9	0.0	2.0	8.9	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	139.4	0.0	36.0	42.0	0.0	55.4	16.4	22.7	0.0	15.4	22.8	15.1
LnGrp LOS	F	A	D	D	A	E	B	C		B	C	B
Approach Vol, veh/h		319			209			696			646	
Approach Delay, s/veh		117.3			51.2			22.5			20.2	
Approach LOS		F			D			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.1	69.4	25.0	22.5	12.4	65.2	10.7	36.8				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	14.5	44.5	19.5	24.5	14.5	44.5	19.5	24.5				
Max Q Clear Time (g_c+I1), s	2.7	26.1	22.7	15.3	6.8	22.2	5.8	6.7				
Green Ext Time (p_c), s	0.0	2.1	0.0	0.3	0.1	2.8	0.0	0.1				

### Intersection Summary

HCM 6th Ctrl Delay	41.1
HCM 6th LOS	D

### Notes

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

HCM 6th TWSC  
2: Kuakini Hwy & North Entrance

06/15/2023

Intersection						
Int Delay, s/veh	1.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↖		↘	↗
Traffic Vol, veh/h	11	51	600	66	98	336
Future Vol, veh/h	11	51	600	66	98	336
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	100	-	-	120	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	3	2	2	2
Mvmt Flow	13	61	714	79	117	400

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1388	756	0	0	793
Stage 1	754	-	-	-	-
Stage 2	634	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	157	408	-	-	828
Stage 1	465	-	-	-	-
Stage 2	529	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	135	407	-	-	828
Mov Cap-2 Maneuver	135	-	-	-	-
Stage 1	465	-	-	-	-
Stage 2	454	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.8	0	2.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	135	407	828	-
HCM Lane V/C Ratio	-	-	0.097	0.149	0.141	-
HCM Control Delay (s)	-	-	34.5	15.4	10.1	-
HCM Lane LOS	-	-	D	C	B	-
HCM 95th %tile Q(veh)	-	-	0.3	0.5	0.5	-

Intersection						
Int Delay, s/veh	4.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	61	75	187	14	27	123
Future Vol, veh/h	61	75	187	14	27	123
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	68	83	208	16	30	137

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	224	0	-	0	435 216
Stage 1	-	-	-	-	216 -
Stage 2	-	-	-	-	219 -
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	1345	-	-	-	578 824
Stage 1	-	-	-	-	820 -
Stage 2	-	-	-	-	817 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1345	-	-	-	549 824
Mov Cap-2 Maneuver	-	-	-	-	549 -
Stage 1	-	-	-	-	778 -
Stage 2	-	-	-	-	817 -

Approach	EB	WB	SB
HCM Control Delay, s	3.5	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1345	-	-	-	756
HCM Lane V/C Ratio	0.05	-	-	-	0.22
HCM Control Delay (s)	7.8	-	-	-	11.1
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.8



HCM 6th Signalized Intersection Summary  
 4: Queen Kaahumanu Hwy & Nani Kailua Dr

06/15/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗	↗	↑	↗	↗	↕	↗
Traffic Volume (veh/h)	59	23	21	67	70	202	37	1294	47	69	955	72
Future Volume (veh/h)	59	23	21	67	70	202	37	1294	47	69	955	72
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		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	1870	1477	1870	1870	1477	1856	1477	1259	1870	1477	1239	1870
Adj Flow Rate, veh/h	61	24	0	70	73	0	39	1348	0	72	995	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	3	2	4	2	2	6	2
Cap, veh/h	117	38		104	80		86	961		96	955	
Arrive On Green	0.13	0.13	0.00	0.12	0.12	0.00	0.03	0.76	0.00	0.04	0.77	0.00
Sat Flow, veh/h	623	300	1585	591	658	1572	1406	1259	1585	1406	1239	1585
Grp Volume(v), veh/h	85	0	0	143	0	0	39	1348	0	72	995	0
Grp Sat Flow(s),veh/h/ln	923	0	1585	1249	0	1572	1406	1259	1585	1406	1239	1585
Q Serve(g_s), s	0.0	0.0	0.0	3.8	0.0	0.0	1.0	125.5	0.0	3.1	126.7	0.0
Cycle Q Clear(g_c), s	14.9	0.0	0.0	18.7	0.0	0.0	1.0	125.5	0.0	3.1	126.7	0.0
Prop In Lane	0.72		1.00	0.49		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	155	0		184	0		86	961		96	955	
V/C Ratio(X)	0.55	0.00		0.78	0.00		0.45	1.40		0.75	1.04	
Avail Cap(c_a), veh/h	155	0		184	0		101	961		101	955	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	68.8	0.0	0.0	71.6	0.0	0.0	51.1	19.5	0.0	56.3	18.9	0.0
Incr Delay (d2), s/veh	4.0	0.0	0.0	18.4	0.0	0.0	3.7	187.5	0.0	24.8	40.7	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	0.0	0.0	7.0	0.0	0.0	1.3	79.5	0.0	3.6	39.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.8	0.0	0.0	90.0	0.0	0.0	54.8	206.9	0.0	81.1	59.6	0.0
LnGrp LOS	E	A		F	A		D	F		F	F	
Approach Vol, veh/h		85			143			1387			1067	
Approach Delay, s/veh		72.8			90.0			202.7			61.0	
Approach LOS		E			F			F			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.2	130.2		25.0	10.5	129.0		25.0				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	5.5	123.5		19.5	5.5	123.5		19.5				
Max Q Clear Time (g_c+I1), s	3.0	128.7		20.7	5.1	127.5		16.9				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.1				

Intersection Summary

HCM 6th Ctrl Delay	136.2
HCM 6th LOS	F

Notes

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

HCM 6th TWSC  
5: Driveway & Hualalai Rd

06/15/2023

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	4	81	4	4	198	8	16	0	3	3	0	3
Future Vol, veh/h	4	81	4	4	198	8	16	0	3	3	0	3
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	-	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	99	5	5	241	10	20	0	4	4	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	251	0	0	104	0	0	370	373	102	370	370	246
Stage 1	-	-	-	-	-	-	112	112	-	256	256	-
Stage 2	-	-	-	-	-	-	258	261	-	114	114	-
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	1314	-	-	1488	-	-	587	557	953	587	560	793
Stage 1	-	-	-	-	-	-	893	803	-	749	696	-
Stage 2	-	-	-	-	-	-	747	692	-	891	801	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1314	-	-	1488	-	-	581	553	953	582	556	793
Mov Cap-2 Maneuver	-	-	-	-	-	-	581	553	-	582	556	-
Stage 1	-	-	-	-	-	-	889	800	-	746	694	-
Stage 2	-	-	-	-	-	-	741	690	-	884	798	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.1	11	10.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	619	1314	-	-	1488	-	-	671
HCM Lane V/C Ratio	0.037	0.004	-	-	0.003	-	-	0.011
HCM Control Delay (s)	11	7.8	0	-	7.4	-	-	10.4
HCM Lane LOS	B	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

HCM 6th TWSC  
6: Queen Kaahumanu Hwy & Hualalai Rd

06/15/2023

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	38	68	166	1383	1019	26
Future Vol, veh/h	38	68	166	1383	1019	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	130	0	420	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	3	6	2
Mvmt Flow	41	74	180	1503	1108	28

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2971	-	1108	0	-	0
Stage 1	1108	-	-	-	-	-
Stage 2	1863	-	-	-	-	-
Critical Hdwy	6.42	-	4.13	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	2.227	-	-	-
Pot Cap-1 Maneuver	~ 16	0	626	-	-	-
Stage 1	316	0	-	-	-	-
Stage 2	135	0	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 11	-	626	-	-	-
Mov Cap-2 Maneuver	107	-	-	-	-	-
Stage 1	225	-	-	-	-	-
Stage 2	135	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	58.4	1.4	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	626	-	107	-	-	-
HCM Lane V/C Ratio	0.288	-	0.386	-	-	-
HCM Control Delay (s)	13.1	-	58.4	0	-	-
HCM Lane LOS	B	-	F	A	-	-
HCM 95th %tile Q(veh)	1.2	-	1.6	-	-	-

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

HCM 6th TWSC  
7: Queen Kaahumanu Hwy & Kuakini Hwy

06/15/2023

Intersection						
Int Delay, s/veh	3.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	12	323	426	1168	990	60
Future Vol, veh/h	12	323	426	1168	990	60
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	150	0	450	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	4	4	6	2
Mvmt Flow	13	340	448	1229	1042	63

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	3168	-	1043	0	0
Stage 1	1043	-	-	-	-
Stage 2	2125	-	-	-	-
Critical Hdwy	6.42	-	4.14	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	-	2.236	-	-
Pot Cap-1 Maneuver	~ 12	0	659	-	-
Stage 1	339	0	-	-	-
Stage 2	99	0	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	~ 4	-	658	-	-
Mov Cap-2 Maneuver	67	-	-	-	-
Stage 1	108	-	-	-	-
Stage 2	99	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	70.8	5.7	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	658	-	67	-	-	-
HCM Lane V/C Ratio	0.681	-	0.189	-	-	-
HCM Control Delay (s)	21.4	-	70.8	0	-	-
HCM Lane LOS	C	-	F	A	-	-
HCM 95th %tile Q(veh)	5.3	-	0.6	-	-	-

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

# HCM 6th Signalized Intersection Summary

## 1: Kuakini Hwy & Hualalai Rd

06/15/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	174	27	28	71	43	188	27	627	59	183	854	278
Future Volume (veh/h)	174	27	28	71	43	188	27	627	59	183	854	278
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.98	1.00		1.00	1.00		0.96
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	1477	1477	1870	1870	1477	1870	1870	1477	1870	1870	1575	1870
Adj Flow Rate, veh/h	176	27	20	72	43	61	27	633	0	185	863	180
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	205	162	120	299	63	89	158	1569		506	934	905
Arrive On Green	0.15	0.21	0.20	0.05	0.12	0.11	0.03	0.56	0.00	0.07	0.59	0.59
Sat Flow, veh/h	1406	785	582	1781	545	774	1781	2879	0	1781	1575	1525
Grp Volume(v), veh/h	176	0	47	72	0	104	27	633	0	185	863	180
Grp Sat Flow(s),veh/h/ln	1406	0	1367	1781	0	1319	1781	1403	0	1781	1575	1525
Q Serve(g_s), s	17.7	0.0	4.1	5.1	0.0	11.0	0.9	18.6	0.0	6.1	71.5	7.9
Cycle Q Clear(g_c), s	17.7	0.0	4.1	5.1	0.0	11.0	0.9	18.6	0.0	6.1	71.5	7.9
Prop In Lane	1.00		0.43	1.00		0.59	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	205	0	282	299	0	152	158	1569		506	934	905
V/C Ratio(X)	0.86	0.00	0.17	0.24	0.00	0.68	0.17	0.40		0.37	0.92	0.20
Avail Cap(c_a), veh/h	249	0	292	518	0	282	357	1569		644	934	905
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.5	0.0	47.5	52.3	0.0	62.0	28.5	18.2	0.0	12.6	26.5	13.6
Incr Delay (d2), s/veh	21.7	0.0	0.1	0.2	0.0	2.0	0.2	0.8	0.0	0.2	15.9	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	0.0	1.4	2.3	0.0	3.8	0.5	6.3	0.0	2.5	30.3	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	82.2	0.0	47.6	52.4	0.0	64.0	28.7	19.0	0.0	12.8	42.4	14.1
LnGrp LOS	F	A	D	D	A	E	C	B		B	D	B
Approach Vol, veh/h		223			176			660			1228	
Approach Delay, s/veh		74.9			59.3			19.4			33.8	
Approach LOS		E			E			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.8	90.0	25.4	20.8	13.7	85.1	12.2	33.9				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	19.5	49.5	24.5	29.5	19.5	49.5	24.5	29.5				
Max Q Clear Time (g_c+I1), s	2.9	73.5	19.7	13.0	8.1	20.6	7.1	6.1				
Green Ext Time (p_c), s	0.0	0.0	0.2	0.3	0.1	2.7	0.0	0.1				

### Intersection Summary

HCM 6th Ctrl Delay	35.6
HCM 6th LOS	D

### Notes

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

HCM 6th TWSC  
2: Kuakini Hwy & North Entrance

06/15/2023

Intersection						
Int Delay, s/veh	1.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	23	82	511	23	59	803
Future Vol, veh/h	23	82	511	23	59	803
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	100	-	-	120	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	87	544	24	63	854

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1538	558	0	0	570	0
Stage 1	558	-	-	-	-	-
Stage 2	980	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	127	529	-	-	1002	-
Stage 1	573	-	-	-	-	-
Stage 2	364	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	119	528	-	-	1000	-
Mov Cap-2 Maneuver	119	-	-	-	-	-
Stage 1	572	-	-	-	-	-
Stage 2	341	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.7	0	0.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	119	528	1000	-
HCM Lane V/C Ratio	-	-	0.206	0.165	0.063	-
HCM Control Delay (s)	-	-	42.9	13.2	8.8	-
HCM Lane LOS	-	-	E	B	A	-
HCM 95th %tile Q(veh)	-	-	0.7	0.6	0.2	-

Intersection						
Int Delay, s/veh	5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	96	84	96	15	13	133
Future Vol, veh/h	96	84	96	15	13	133
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	3
Mvmt Flow	105	92	105	16	14	146

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	121	0	-	0	415 113
Stage 1	-	-	-	-	113 -
Stage 2	-	-	-	-	302 -
Critical Hdwy	4.12	-	-	-	6.42 6.23
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.327
Pot Cap-1 Maneuver	1467	-	-	-	594 937
Stage 1	-	-	-	-	912 -
Stage 2	-	-	-	-	750 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1467	-	-	-	551 937
Mov Cap-2 Maneuver	-	-	-	-	551 -
Stage 1	-	-	-	-	846 -
Stage 2	-	-	-	-	750 -

Approach	EB	WB	SB
HCM Control Delay, s	4.1	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1467	-	-	-	882
HCM Lane V/C Ratio	0.072	-	-	-	0.182
HCM Control Delay (s)	7.6	-	-	-	10
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.7

HCM 6th Signalized Intersection Summary  
 4: Queen Kaahumanu Hwy & Nani Kailua Dr

06/15/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗	↗	↑	↗	↗	↕	↗
Traffic Volume (veh/h)	55	49	13	39	42	129	24	1009	42	142	1213	93
Future Volume (veh/h)	55	49	13	39	42	129	24	1009	42	142	1213	93
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		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	1870	1870	1870	1870	1870	1856	1477	1259	1870	1442	1280	1870
Adj Flow Rate, veh/h	60	53	0	42	46	0	26	1097	0	154	1318	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	3	2	4	2	5	2	2
Cap, veh/h	109	71		90	81		83	997		94	1024	
Arrive On Green	0.10	0.10	0.00	0.09	0.09	0.00	0.03	0.79	0.00	0.04	0.80	0.00
Sat Flow, veh/h	756	717	1585	615	876	1572	1406	1259	1585	1373	1280	1585
Grp Volume(v), veh/h	113	0	0	88	0	0	26	1097	0	154	1318	0
Grp Sat Flow(s),veh/h/ln	1473	0	1585	1491	0	1572	1406	1259	1585	1373	1280	1585
Q Serve(g_s), s	3.1	0.0	0.0	0.0	0.0	0.0	0.6	126.5	0.0	5.7	127.9	0.0
Cycle Q Clear(g_c), s	12.2	0.0	0.0	9.1	0.0	0.0	0.6	126.5	0.0	5.7	127.9	0.0
Prop In Lane	0.53		1.00	0.48		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	180	0		171	0		83	997		94	1024	
V/C Ratio(X)	0.63	0.00		0.51	0.00		0.31	1.10		1.64	1.29	
Avail Cap(c_a), veh/h	231	0		223	0		95	997		94	1024	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	70.4	0.0	0.0	69.7	0.0	0.0	52.3	16.7	0.0	62.1	15.9	0.0
Incr Delay (d2), s/veh	3.6	0.0	0.0	2.4	0.0	0.0	2.1	60.1	0.0	329.9	136.5	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	0.0	0.0	3.6	0.0	0.0	0.9	44.0	0.0	12.4	66.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.0	0.0	0.0	72.1	0.0	0.0	54.4	76.7	0.0	391.9	152.4	0.0
LnGrp LOS	E	A		E	A		D	F		F	F	
Approach Vol, veh/h		113			88			1123			1472	
Approach Delay, s/veh		74.0			72.1			76.2			177.5	
Approach LOS		E			E			E			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	131.4		19.8	10.0	130.0		19.8				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	4.5	124.5		19.5	4.5	124.5		19.5				
Max Q Clear Time (g_c+I1), s	2.6	129.9		11.1	7.7	128.5		14.2				
Green Ext Time (p_c), s	0.0	0.0		0.2	0.0	0.0		0.2				

Intersection Summary

HCM 6th Ctrl Delay	129.3
HCM 6th LOS	F

Notes

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



HCM 6th TWSC  
5: Driveway & Hualalai Rd

06/15/2023

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	5	101	20	8	98	1	14	0	2	3	0	2
Future Vol, veh/h	5	101	20	8	98	1	14	0	2	3	0	2
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	-	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	122	24	10	118	1	17	0	2	4	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	119	0	0	146	0	0	286	285	134	286	297	119
Stage 1	-	-	-	-	-	-	146	146	-	139	139	-
Stage 2	-	-	-	-	-	-	140	139	-	147	158	-
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	1469	-	-	1436	-	-	666	624	915	666	615	933
Stage 1	-	-	-	-	-	-	857	776	-	864	782	-
Stage 2	-	-	-	-	-	-	863	782	-	856	767	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1469	-	-	1436	-	-	659	617	915	659	608	933
Mov Cap-2 Maneuver	-	-	-	-	-	-	659	617	-	659	608	-
Stage 1	-	-	-	-	-	-	854	773	-	861	777	-
Stage 2	-	-	-	-	-	-	855	777	-	850	764	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0.6			10.4			9.9		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	683	1469	-	-	1436	-	-	747
HCM Lane V/C Ratio	0.028	0.004	-	-	0.007	-	-	0.008
HCM Control Delay (s)	10.4	7.5	0	-	7.5	-	-	9.9
HCM Lane LOS	B	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

HCM 6th TWSC  
6: Queen Kaahumanu Hwy & Hualalai Rd

06/15/2023

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	91	75	1057	1241	18
Future Vol, veh/h	15	91	75	1057	1241	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	130	0	420	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	4	3	2
Mvmt Flow	16	98	81	1137	1334	19

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2633	-	1334	0	-	0
Stage 1	1334	-	-	-	-	-
Stage 2	1299	-	-	-	-	-
Critical Hdwy	6.42	-	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	2.218	-	-	-
Pot Cap-1 Maneuver	26	0	517	-	-	-
Stage 1	246	0	-	-	-	-
Stage 2	256	0	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	22	-	517	-	-	-
Mov Cap-2 Maneuver	151	-	-	-	-	-
Stage 1	207	-	-	-	-	-
Stage 2	256	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	31.7	0.9	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	517	-	151	-	-	-
HCM Lane V/C Ratio	0.156	-	0.107	-	-	-
HCM Control Delay (s)	13.2	-	31.7	0	-	-
HCM Lane LOS	B	-	D	A	-	-
HCM 95th %tile Q(veh)	0.5	-	0.4	-	-	-

HCM 6th TWSC  
7: Queen Kaahumanu Hwy & Kuakini Hwy

06/15/2023

Intersection						
Int Delay, s/veh	2.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	18	777	278	999	1083	33
Future Vol, veh/h	18	777	278	999	1083	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	150	0	450	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	3	3	2
Mvmt Flow	19	809	290	1041	1128	34

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	2749	-	1128	0	-
Stage 1	1128	-	-	-	-
Stage 2	1621	-	-	-	-
Critical Hdwy	6.42	-	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	-	2.218	-	-
Pot Cap-1 Maneuver	22	0	619	-	-
Stage 1	309	0	-	-	-
Stage 2	178	0	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	~ 12	-	619	-	-
Mov Cap-2 Maneuver	112	-	-	-	-
Stage 1	164	-	-	-	-
Stage 2	178	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	43.5	3.4	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	619	-	112	-	-	-
HCM Lane V/C Ratio	0.468	-	0.167	-	-	-
HCM Control Delay (s)	15.8	-	43.5	0	-	-
HCM Lane LOS	C	-	E	A	-	-
HCM 95th %tile Q(veh)	2.5	-	0.6	-	-	-

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

# HCM 6th Signalized Intersection Summary

## 1: Kuakini Hwy & Hualalai Rd

06/15/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	238	46	27	63	44	221	22	674	53	139	413	170
Future Volume (veh/h)	238	46	27	63	44	221	22	674	53	139	413	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		0.98	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	1453	1477	1870	1870	1477	1856	1870	1477	1870	1870	1477	1841
Adj Flow Rate, veh/h	251	48	20	66	46	98	23	709	0	146	435	74
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	2	2	2	2	3	2	2	2	2	2	4
Cap, veh/h	218	251	104	343	61	131	409	1397		412	783	826
Arrive On Green	0.16	0.25	0.24	0.05	0.15	0.14	0.03	0.50	0.00	0.06	0.53	0.53
Sat Flow, veh/h	1384	989	412	1781	415	884	1781	2879	0	1781	1477	1558
Grp Volume(v), veh/h	251	0	68	66	0	144	23	709	0	146	435	74
Grp Sat Flow(s),veh/h/ln	1384	0	1400	1781	0	1299	1781	1403	0	1781	1477	1558
Q Serve(g_s), s	19.7	0.0	4.8	3.9	0.0	13.3	0.8	21.2	0.0	4.8	24.5	2.9
Cycle Q Clear(g_c), s	19.7	0.0	4.8	3.9	0.0	13.3	0.8	21.2	0.0	4.8	24.5	2.9
Prop In Lane	1.00		0.29	1.00		0.68	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	218	0	355	343	0	192	409	1397		412	783	826
V/C Ratio(X)	1.15	0.00	0.19	0.19	0.00	0.75	0.06	0.51		0.35	0.56	0.09
Avail Cap(c_a), veh/h	218	0	355	531	0	270	577	1397		522	783	826
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.6	0.0	36.8	41.8	0.0	51.6	15.9	21.1	0.0	15.0	19.6	14.5
Incr Delay (d2), s/veh	107.6	0.0	0.1	0.1	0.0	3.8	0.0	1.3	0.0	0.2	2.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.4	0.0	1.7	1.7	0.0	4.6	0.3	7.3	0.0	2.0	9.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	160.2	0.0	36.9	41.9	0.0	55.4	15.9	22.4	0.0	15.2	22.4	14.7
LnGrp LOS	F	A	D	D	A	E	B	C		B	C	B
Approach Vol, veh/h		319			210			732			655	
Approach Delay, s/veh		133.9			51.2			22.2			19.9	
Approach LOS		F			D			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.3	70.3	24.0	22.5	12.3	66.2	10.8	35.7				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	14.5	45.5	18.5	24.5	14.5	45.5	18.5	24.5				
Max Q Clear Time (g_c+I1), s	2.8	26.5	21.7	15.3	6.8	23.2	5.9	6.8				
Green Ext Time (p_c), s	0.0	2.1	0.0	0.3	0.1	3.0	0.0	0.1				

### Intersection Summary

HCM 6th Ctrl Delay	43.2
HCM 6th LOS	D

### Notes

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

HCM 6th TWSC  
2: Kuakini Hwy & North Entrance

06/15/2023

Intersection						
Int Delay, s/veh	2.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	59	630	67	100	344
Future Vol, veh/h	15	59	630	67	100	344
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	100	-	-	120	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	3	2	2	2
Mvmt Flow	18	70	750	80	119	410

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1438	792	0	0	830
Stage 1	790	-	-	-	-
Stage 2	648	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	147	389	-	-	802
Stage 1	447	-	-	-	-
Stage 2	521	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	125	388	-	-	802
Mov Cap-2 Maneuver	125	-	-	-	-
Stage 1	447	-	-	-	-
Stage 2	444	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.8	0	2.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	125	388	802	-
HCM Lane V/C Ratio	-	-	0.143	0.181	0.148	-
HCM Control Delay (s)	-	-	38.5	16.3	10.3	-
HCM Lane LOS	-	-	E	C	B	-
HCM 95th %tile Q(veh)	-	-	0.5	0.7	0.5	-

HCM 6th TWSC  
3: Hualalai Rd & Nani Kailua Rd

06/15/2023

Intersection						
Int Delay, s/veh	4.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	64	75	187	14	27	124
Future Vol, veh/h	64	75	187	14	27	124
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	71	83	208	16	30	138

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	224	0	-	0	441 216
Stage 1	-	-	-	-	216 -
Stage 2	-	-	-	-	225 -
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	1345	-	-	-	574 824
Stage 1	-	-	-	-	820 -
Stage 2	-	-	-	-	812 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1345	-	-	-	544 824
Mov Cap-2 Maneuver	-	-	-	-	544 -
Stage 1	-	-	-	-	777 -
Stage 2	-	-	-	-	812 -

Approach	EB	WB	SB
HCM Control Delay, s	3.6	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1345	-	-	-	755
HCM Lane V/C Ratio	0.053	-	-	-	0.222
HCM Control Delay (s)	7.8	-	-	-	11.1
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.8

# HCM 6th Signalized Intersection Summary

## 4: Queen Kaahumanu Hwy & Nani Kailua Dr

06/15/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔	↔	↔	↑	↔	↔	↔	↔
Traffic Volume (veh/h)	60	25	21	67	70	202	37	1294	47	69	955	72
Future Volume (veh/h)	60	25	21	67	70	202	37	1294	47	69	955	72
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		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	1870	1477	1870	1870	1477	1856	1477	1259	1870	1477	1239	1870
Adj Flow Rate, veh/h	62	26	0	70	73	0	39	1348	0	72	995	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	3	2	4	2	2	6	2
Cap, veh/h	115	40		104	79		86	961		96	955	
Arrive On Green	0.13	0.13	0.00	0.12	0.12	0.00	0.03	0.76	0.00	0.04	0.77	0.00
Sat Flow, veh/h	612	316	1585	586	653	1572	1406	1259	1585	1406	1239	1585
Grp Volume(v), veh/h	88	0	0	143	0	0	39	1348	0	72	995	0
Grp Sat Flow(s),veh/h/ln	928	0	1585	1239	0	1572	1406	1259	1585	1406	1239	1585
Q Serve(g_s), s	0.0	0.0	0.0	3.5	0.0	0.0	1.0	125.5	0.0	3.1	126.7	0.0
Cycle Q Clear(g_c), s	15.4	0.0	0.0	18.9	0.0	0.0	1.0	125.5	0.0	3.1	126.7	0.0
Prop In Lane	0.70		1.00	0.49		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	156	0		183	0		86	961		96	955	
V/C Ratio(X)	0.56	0.00		0.78	0.00		0.45	1.40		0.75	1.04	
Avail Cap(c_a), veh/h	156	0		183	0		101	961		101	955	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	69.0	0.0	0.0	71.7	0.0	0.0	51.1	19.5	0.0	56.3	18.9	0.0
Incr Delay (d2), s/veh	4.7	0.0	0.0	19.2	0.0	0.0	3.7	187.5	0.0	24.8	40.7	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.0	0.0	7.0	0.0	0.0	1.3	79.5	0.0	3.6	39.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.7	0.0	0.0	90.9	0.0	0.0	54.8	206.9	0.0	81.1	59.6	0.0
LnGrp LOS	E	A		F	A		D	F		F	F	
Approach Vol, veh/h		88			143			1387			1067	
Approach Delay, s/veh		73.7			90.9			202.7			61.0	
Approach LOS		E			F			F			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.2	130.2		25.0	10.5	129.0		25.0				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	5.5	123.5		19.5	5.5	123.5		19.5				
Max Q Clear Time (g_c+I1), s	3.0	128.7		20.9	5.1	127.5		17.4				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.1				

### Intersection Summary

HCM 6th Ctrl Delay	136.2
HCM 6th LOS	F

### Notes

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

HCM 6th TWSC  
5: Driveway & Hualalai Rd

06/15/2023

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	4	81	4	4	198	8	16	0	3	3	0	3
Future Vol, veh/h	4	81	4	4	198	8	16	0	3	3	0	3
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	-	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	99	5	5	241	10	20	0	4	4	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	251	0	0	104	0	0	370	373	102	370	370	246
Stage 1	-	-	-	-	-	-	112	112	-	256	256	-
Stage 2	-	-	-	-	-	-	258	261	-	114	114	-
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	1314	-	-	1488	-	-	587	557	953	587	560	793
Stage 1	-	-	-	-	-	-	893	803	-	749	696	-
Stage 2	-	-	-	-	-	-	747	692	-	891	801	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1314	-	-	1488	-	-	581	553	953	582	556	793
Mov Cap-2 Maneuver	-	-	-	-	-	-	581	553	-	582	556	-
Stage 1	-	-	-	-	-	-	889	800	-	746	694	-
Stage 2	-	-	-	-	-	-	741	690	-	884	798	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.1	11	10.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	619	1314	-	-	1488	-	-	671
HCM Lane V/C Ratio	0.037	0.004	-	-	0.003	-	-	0.011
HCM Control Delay (s)	11	7.8	0	-	7.4	-	-	10.4
HCM Lane LOS	B	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0



HCM 6th TWSC  
6: Queen Kaahumanu Hwy & Hualalai Rd

06/15/2023

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	38	68	166	1383	1019	26
Future Vol, veh/h	38	68	166	1383	1019	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	130	0	420	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	3	6	2
Mvmt Flow	41	74	180	1503	1108	28

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2971	-	1108	0	-	0
Stage 1	1108	-	-	-	-	-
Stage 2	1863	-	-	-	-	-
Critical Hdwy	6.42	-	4.13	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	2.227	-	-	-
Pot Cap-1 Maneuver	~ 16	0	626	-	-	-
Stage 1	316	0	-	-	-	-
Stage 2	135	0	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 11	-	626	-	-	-
Mov Cap-2 Maneuver	107	-	-	-	-	-
Stage 1	225	-	-	-	-	-
Stage 2	135	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	58.4	1.4	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	626	-	107	-	-	-
HCM Lane V/C Ratio	0.288	-	0.386	-	-	-
HCM Control Delay (s)	13.1	-	58.4	0	-	-
HCM Lane LOS	B	-	F	A	-	-
HCM 95th %tile Q(veh)	1.2	-	1.6	-	-	-

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

HCM 6th TWSC  
7: Queen Kaahumanu Hwy & Kuakini Hwy

06/15/2023

Intersection						
Int Delay, s/veh	3.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	13	341	431	1168	990	60
Future Vol, veh/h	13	341	431	1168	990	60
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	150	0	450	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	4	4	6	2
Mvmt Flow	14	359	454	1229	1042	63

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	3180	-	1043	0	0
Stage 1	1043	-	-	-	-
Stage 2	2137	-	-	-	-
Critical Hdwy	6.42	-	4.14	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	-	2.236	-	-
Pot Cap-1 Maneuver	~ 11	0	659	-	-
Stage 1	339	0	-	-	-
Stage 2	98	0	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	~ 3	-	658	-	-
Mov Cap-2 Maneuver	65	-	-	-	-
Stage 1	105	-	-	-	-
Stage 2	98	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	74.6	5.9	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	658	-	65	-	-	-
HCM Lane V/C Ratio	0.689	-	0.211	-	-	-
HCM Control Delay (s)	21.7	-	74.6	0	-	-
HCM Lane LOS	C	-	F	A	-	-
HCM 95th %tile Q(veh)	5.5	-	0.7	-	-	-

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

HCM 6th TWSC  
 9: Kuakini Hwy & South Entrance

06/15/2023

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↖		↖	↗
Traffic Vol, veh/h	18	30	667	5	8	351
Future Vol, veh/h	18	30	667	5	8	351
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	0	-	-	0	-
Veh in Median Storage, #	2	-	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	20	33	725	5	9	382

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1128	728	0	0	730
Stage 1	728	-	-	-	-
Stage 2	400	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	226	423	-	-	874
Stage 1	478	-	-	-	-
Stage 2	677	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	224	423	-	-	874
Mov Cap-2 Maneuver	412	-	-	-	-
Stage 1	478	-	-	-	-
Stage 2	670	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.2	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	412	423	874
HCM Lane V/C Ratio	-	-	0.047	0.077	0.01
HCM Control Delay (s)	-	-	14.2	14.2	9.2
HCM Lane LOS	-	-	B	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0.2	0

# HCM 6th Signalized Intersection Summary

## 1: Kuakini Hwy & Hualalai Rd

06/15/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	174	27	30	75	43	188	28	636	60	183	893	278
Future Volume (veh/h)	174	27	30	75	43	188	28	636	60	183	893	278
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.98	1.00		1.00	1.00		0.96
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	1477	1477	1870	1870	1477	1870	1870	1477	1870	1870	1575	1870
Adj Flow Rate, veh/h	176	27	22	76	43	61	28	642	0	185	902	180
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	205	153	125	303	63	89	129	1569		501	934	904
Arrive On Green	0.15	0.20	0.19	0.06	0.12	0.11	0.03	0.56	0.00	0.07	0.59	0.59
Sat Flow, veh/h	1406	750	611	1781	545	774	1781	2879	0	1781	1575	1525
Grp Volume(v), veh/h	176	0	49	76	0	104	28	642	0	185	902	180
Grp Sat Flow(s),veh/h/ln	1406	0	1361	1781	0	1319	1781	1403	0	1781	1575	1525
Q Serve(g_s), s	17.7	0.0	4.3	5.4	0.0	11.0	1.0	19.0	0.0	6.1	79.1	7.9
Cycle Q Clear(g_c), s	17.7	0.0	4.3	5.4	0.0	11.0	1.0	19.0	0.0	6.1	79.1	7.9
Prop In Lane	1.00		0.45	1.00		0.59	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	205	0	278	303	0	152	129	1569		501	934	904
V/C Ratio(X)	0.86	0.00	0.18	0.25	0.00	0.68	0.22	0.41		0.37	0.97	0.20
Avail Cap(c_a), veh/h	249	0	291	517	0	282	327	1569		640	934	904
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.5	0.0	47.9	52.1	0.0	62.0	32.5	18.3	0.0	12.7	28.1	13.6
Incr Delay (d2), s/veh	21.7	0.0	0.1	0.2	0.0	2.0	0.3	0.8	0.0	0.2	22.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	0.0	1.5	2.5	0.0	3.8	0.5	6.4	0.0	2.5	34.8	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	82.2	0.0	48.0	52.3	0.0	64.0	32.9	19.0	0.0	12.9	50.4	14.1
LnGrp LOS	F	A	D	D	A	E	C	B		B	D	B
Approach Vol, veh/h		225			180			670			1267	
Approach Delay, s/veh		74.7			59.1			19.6			39.8	
Approach LOS		E			E			B			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.9	90.0	25.4	20.8	13.7	85.1	12.5	33.6				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	19.5	49.5	24.5	29.5	19.5	49.5	24.5	29.5				
Max Q Clear Time (g_c+I1), s	3.0	81.1	19.7	13.0	8.1	21.0	7.4	6.3				
Green Ext Time (p_c), s	0.0	0.0	0.2	0.3	0.1	2.7	0.0	0.1				

### Intersection Summary

HCM 6th Ctrl Delay	38.9
HCM 6th LOS	D

### Notes

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

HCM 6th TWSC  
2: Kuakini Hwy & North Entrance

06/15/2023

Intersection						
Int Delay, s/veh	1.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↖		↙	↗
Traffic Vol, veh/h	24	84	520	28	68	839
Future Vol, veh/h	24	84	520	28	68	839
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	100	-	-	120	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	89	553	30	72	893

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1607	570	0	0	585	0
Stage 1	570	-	-	-	-	-
Stage 2	1037	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	116	521	-	-	990	-
Stage 1	566	-	-	-	-	-
Stage 2	342	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	107	520	-	-	988	-
Mov Cap-2 Maneuver	107	-	-	-	-	-
Stage 1	565	-	-	-	-	-
Stage 2	317	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.3	0	0.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	107	520	988	-
HCM Lane V/C Ratio	-	-	0.239	0.172	0.073	-
HCM Control Delay (s)	-	-	48.9	13.4	8.9	-
HCM Lane LOS	-	-	E	B	A	-
HCM 95th %tile Q(veh)	-	-	0.9	0.6	0.2	-

Intersection						
Int Delay, s/veh	5.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	97	84	96	15	13	137
Future Vol, veh/h	97	84	96	15	13	137
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	3
Mvmt Flow	107	92	105	16	14	151

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	121	0	-	0	419 113
Stage 1	-	-	-	-	113 -
Stage 2	-	-	-	-	306 -
Critical Hdwy	4.12	-	-	-	6.42 6.23
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.327
Pot Cap-1 Maneuver	1467	-	-	-	591 937
Stage 1	-	-	-	-	912 -
Stage 2	-	-	-	-	747 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1467	-	-	-	548 937
Mov Cap-2 Maneuver	-	-	-	-	548 -
Stage 1	-	-	-	-	845 -
Stage 2	-	-	-	-	747 -

Approach	EB	WB	SB
HCM Control Delay, s	4.1	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1467	-	-	-	883
HCM Lane V/C Ratio	0.073	-	-	-	0.187
HCM Control Delay (s)	7.6	-	-	-	10
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.7

HCM 6th Signalized Intersection Summary  
 4: Queen Kaahumanu Hwy & Nani Kailua Dr

06/15/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (veh/h)	55	50	13	39	44	129	24	1009	42	142	1213	94
Future Volume (veh/h)	55	50	13	39	44	129	24	1009	42	142	1213	94
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		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	1870	1870	1870	1870	1870	1856	1477	1259	1870	1442	1280	1870
Adj Flow Rate, veh/h	60	54	0	42	48	0	26	1097	0	154	1318	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	3	2	4	2	5	2	2
Cap, veh/h	109	72		89	84		83	996		94	1023	
Arrive On Green	0.10	0.10	0.00	0.09	0.09	0.00	0.03	0.79	0.00	0.04	0.80	0.00
Sat Flow, veh/h	744	721	1585	601	892	1572	1406	1259	1585	1373	1280	1585
Grp Volume(v), veh/h	114	0	0	90	0	0	26	1097	0	154	1318	0
Grp Sat Flow(s),veh/h/ln	1466	0	1585	1493	0	1572	1406	1259	1585	1373	1280	1585
Q Serve(g_s), s	3.1	0.0	0.0	0.0	0.0	0.0	0.6	126.5	0.0	5.7	127.9	0.0
Cycle Q Clear(g_c), s	12.4	0.0	0.0	9.3	0.0	0.0	0.6	126.5	0.0	5.7	127.9	0.0
Prop In Lane	0.53		1.00	0.47		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	181	0		173	0		83	996		94	1023	
V/C Ratio(X)	0.63	0.00		0.52	0.00		0.31	1.10		1.64	1.29	
Avail Cap(c_a), veh/h	230	0		222	0		95	996		94	1023	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	70.4	0.0	0.0	69.7	0.0	0.0	52.2	16.8	0.0	62.1	16.0	0.0
Incr Delay (d2), s/veh	3.6	0.0	0.0	2.4	0.0	0.0	2.1	60.6	0.0	330.8	137.2	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	0.0	0.0	3.7	0.0	0.0	0.9	44.2	0.0	12.4	66.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.0	0.0	0.0	72.1	0.0	0.0	54.4	77.3	0.0	392.9	153.2	0.0
LnGrp LOS	E	A		E	A		D	F		F	F	
Approach Vol, veh/h		114			90			1123			1472	
Approach Delay, s/veh		74.0			72.1			76.8			178.3	
Approach LOS		E			E			E			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	131.4		20.0	10.0	130.0		20.0				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	4.5	124.5		19.5	4.5	124.5		19.5				
Max Q Clear Time (g_c+I1), s	2.6	129.9		11.3	7.7	128.5		14.4				
Green Ext Time (p_c), s	0.0	0.0		0.2	0.0	0.0		0.2				

Intersection Summary

HCM 6th Ctrl Delay	129.9
HCM 6th LOS	F

Notes

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

HCM 6th TWSC  
5: Driveway & Hualalai Rd

06/15/2023

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	5	101	20	8	98	1	14	0	2	3	0	2
Future Vol, veh/h	5	101	20	8	98	1	14	0	2	3	0	2
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	-	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	122	24	10	118	1	17	0	2	4	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	119	0	0	146	0	0	286	285	134	286	297	119
Stage 1	-	-	-	-	-	-	146	146	-	139	139	-
Stage 2	-	-	-	-	-	-	140	139	-	147	158	-
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	1469	-	-	1436	-	-	666	624	915	666	615	933
Stage 1	-	-	-	-	-	-	857	776	-	864	782	-
Stage 2	-	-	-	-	-	-	863	782	-	856	767	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1469	-	-	1436	-	-	659	617	915	659	608	933
Mov Cap-2 Maneuver	-	-	-	-	-	-	659	617	-	659	608	-
Stage 1	-	-	-	-	-	-	854	773	-	861	777	-
Stage 2	-	-	-	-	-	-	855	777	-	850	764	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0.6			10.4			9.9		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	683	1469	-	-	1436	-	-	747
HCM Lane V/C Ratio	0.028	0.004	-	-	0.007	-	-	0.008
HCM Control Delay (s)	10.4	7.5	0	-	7.5	-	-	9.9
HCM Lane LOS	B	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0



HCM 6th TWSC  
6: Queen Kaahumanu Hwy & Hualalai Rd

06/15/2023

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	15	91	75	1057	1241	18
Future Vol, veh/h	15	91	75	1057	1241	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	130	0	420	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	4	3	2
Mvmt Flow	16	98	81	1137	1334	19

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2633	-	1334	0	-	0
Stage 1	1334	-	-	-	-	-
Stage 2	1299	-	-	-	-	-
Critical Hdwy	6.42	-	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	2.218	-	-	-
Pot Cap-1 Maneuver	26	0	517	-	-	-
Stage 1	246	0	-	-	-	-
Stage 2	256	0	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	22	-	517	-	-	-
Mov Cap-2 Maneuver	151	-	-	-	-	-
Stage 1	207	-	-	-	-	-
Stage 2	256	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	31.7	0.9	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	517	-	151	-	-	-
HCM Lane V/C Ratio	0.156	-	0.107	-	-	-
HCM Control Delay (s)	13.2	-	31.7	0	-	-
HCM Lane LOS	B	-	D	A	-	-
HCM 95th %tile Q(veh)	0.5	-	0.4	-	-	-

HCM 6th TWSC  
7: Queen Kaahumanu Hwy & Kuakini Hwy

06/15/2023

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	18	782	299	999	1083	34
Future Vol, veh/h	18	782	299	999	1083	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	150	0	450	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	3	3	2
Mvmt Flow	19	815	311	1041	1128	35

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2791	-	1128	0	-	0
Stage 1	1128	-	-	-	-	-
Stage 2	1663	-	-	-	-	-
Critical Hdwy	6.42	-	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	2.218	-	-	-
Pot Cap-1 Maneuver	21	0	619	-	-	-
Stage 1	309	0	-	-	-	-
Stage 2	169	0	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 10	-	619	-	-	-
Mov Cap-2 Maneuver	105	-	-	-	-	-
Stage 1	154	-	-	-	-	-
Stage 2	169	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	46.6	3.8	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	619	-	105	-	-	-
HCM Lane V/C Ratio	0.503	-	0.179	-	-	-
HCM Control Delay (s)	16.6	-	46.6	0	-	-
HCM Lane LOS	C	-	E	A	-	-
HCM 95th %tile Q(veh)	2.8	-	0.6	-	-	-

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

HCM 6th TWSC  
 9: Kuakini Hwy & South Entrance

06/15/2023

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↖		↖	↗
Traffic Vol, veh/h	5	9	539	21	36	827
Future Vol, veh/h	5	9	539	21	36	827
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	0	-	-	0	-
Veh in Median Storage, #	2	-	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	5	10	586	23	39	899























Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1575	598	0	0	609	0
Stage 1	598	-	-	-	-	-
Stage 2	977	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	121	502	-	-	970	-
Stage 1	549	-	-	-	-	-
Stage 2	365	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	116	502	-	-	970	-
Mov Cap-2 Maneuver	297	-	-	-	-	-
Stage 1	549	-	-	-	-	-
Stage 2	350	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.1	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	297	502	970	-
HCM Lane V/C Ratio	-	-	0.018	0.019	0.04	-
HCM Control Delay (s)	-	-	17.3	12.3	8.9	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	0.1	-

HCM 6th Signalized Intersection Summary  
 1: Kuakini Hwy & Hualalai Rd

06/20/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	250	48	28	65	46	232	21	671	52	146	421	179
Future Volume (veh/h)	250	48	28	65	46	232	21	671	52	146	421	179
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		0.98	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	1453	1477	1870	1870	1477	1856	1870	1477	1870	1870	1477	1841
Adj Flow Rate, veh/h	263	51	21	68	48	109	22	706	0	154	443	83
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	2	2	2	2	3	2	2	2	2	2	4
Cap, veh/h	229	267	110	355	62	141	379	1340		401	760	802
Arrive On Green	0.17	0.27	0.26	0.05	0.16	0.14	0.03	0.48	0.00	0.07	0.51	0.51
Sat Flow, veh/h	1384	992	409	1781	396	900	1781	2879	0	1781	1477	1558
Grp Volume(v), veh/h	263	0	72	68	0	157	22	706	0	154	443	83
Grp Sat Flow(s),veh/h/ln	1384	0	1401	1781	0	1297	1781	1403	0	1781	1477	1558
Q Serve(g_s), s	20.7	0.0	5.0	3.9	0.0	14.6	0.8	21.9	0.0	5.2	26.0	3.4
Cycle Q Clear(g_c), s	20.7	0.0	5.0	3.9	0.0	14.6	0.8	21.9	0.0	5.2	26.0	3.4
Prop In Lane	1.00		0.29	1.00		0.69	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	229	0	377	355	0	202	379	1340		401	760	802
V/C Ratio(X)	1.15	0.00	0.19	0.19	0.00	0.78	0.06	0.53		0.38	0.58	0.10
Avail Cap(c_a), veh/h	229	0	377	556	0	270	548	1340		504	760	802
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.1	0.0	35.4	40.9	0.0	51.2	17.3	22.8	0.0	16.2	21.0	15.6
Incr Delay (d2), s/veh	105.0	0.0	0.1	0.1	0.0	6.7	0.0	1.5	0.0	0.2	3.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.9	0.0	1.7	1.8	0.0	5.2	0.3	7.6	0.0	2.1	9.7	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	157.2	0.0	35.5	41.0	0.0	57.8	17.3	24.3	0.0	16.4	24.3	15.8
LnGrp LOS	F	A	D	D	A	E	B	C		B	C	B
Approach Vol, veh/h		335			225			728			680	
Approach Delay, s/veh		131.0			52.7			24.0			21.5	
Approach LOS		F			D			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.2	68.3	25.0	23.5	12.8	63.7	10.9	37.6				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	14.5	44.5	19.5	24.5	14.5	44.5	19.5	24.5				
Max Q Clear Time (g_c+I1), s	2.8	28.0	22.7	16.6	7.2	23.9	5.9	7.0				
Green Ext Time (p_c), s	0.0	2.1	0.0	0.3	0.1	2.9	0.0	0.2				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			44.6									
HCM 6th LOS			D									
<b>Notes</b>												
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th TWSC  
2: Kuakini Hwy & North Entrance

06/15/2023

Intersection						
Int Delay, s/veh	1.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↖		↘	↗
Traffic Vol, veh/h	11	51	631	66	98	353
Future Vol, veh/h	11	51	631	66	98	353
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	100	-	-	120	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	3	2	2	2
Mvmt Flow	13	61	751	79	117	420

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1445	793	0	0	830
Stage 1	791	-	-	-	-
Stage 2	654	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	145	389	-	-	802
Stage 1	447	-	-	-	-
Stage 2	517	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	124	388	-	-	802
Mov Cap-2 Maneuver	124	-	-	-	-
Stage 1	447	-	-	-	-
Stage 2	442	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.8	0	2.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	124	388	802	-
HCM Lane V/C Ratio	-	-	0.106	0.156	0.145	-
HCM Control Delay (s)	-	-	37.4	16	10.3	-
HCM Lane LOS	-	-	E	C	B	-
HCM 95th %tile Q(veh)	-	-	0.3	0.5	0.5	-

Intersection						
Int Delay, s/veh	4.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	64	79	197	15	28	129
Future Vol, veh/h	64	79	197	15	28	129
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	71	88	219	17	31	143

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	236	0	-	0	458 228
Stage 1	-	-	-	-	228 -
Stage 2	-	-	-	-	230 -
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	1331	-	-	-	561 811
Stage 1	-	-	-	-	810 -
Stage 2	-	-	-	-	808 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1331	-	-	-	531 811
Mov Cap-2 Maneuver	-	-	-	-	531 -
Stage 1	-	-	-	-	767 -
Stage 2	-	-	-	-	808 -

Approach	EB	WB	SB
HCM Control Delay, s	3.5	0	11.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1331	-	-	-	741
HCM Lane V/C Ratio	0.053	-	-	-	0.235
HCM Control Delay (s)	7.9	-	-	-	11.3
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.9

HCM 6th Signalized Intersection Summary  
 4: Queen Kaahumanu Hwy & Nani Kailua Dr

06/15/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (veh/h)	62	24	22	70	73	212	39	1360	49	73	1004	76
Future Volume (veh/h)	62	24	22	70	73	212	39	1360	49	73	1004	76
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		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	1870	1477	1870	1870	1477	1856	1477	1259	1870	1477	1239	1870
Adj Flow Rate, veh/h	65	25	0	73	76	0	41	1417	0	76	1046	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	3	2	4	2	2	6	2
Cap, veh/h	116	37		105	79		86	958		100	955	
Arrive On Green	0.13	0.13	0.00	0.12	0.12	0.00	0.03	0.76	0.00	0.04	0.77	0.00
Sat Flow, veh/h	614	290	1585	597	651	1572	1406	1259	1585	1406	1239	1585
Grp Volume(v), veh/h	90	0	0	149	0	0	41	1417	0	76	1046	0
Grp Sat Flow(s),veh/h/ln	904	0	1585	1248	0	1572	1406	1259	1585	1406	1239	1585
Q Serve(g_s), s	0.0	0.0	0.0	3.5	0.0	0.0	1.1	125.5	0.0	3.6	127.1	0.0
Cycle Q Clear(g_c), s	16.1	0.0	0.0	19.7	0.0	0.0	1.1	125.5	0.0	3.6	127.1	0.0
Prop In Lane	0.72		1.00	0.49		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	153	0		184	0		86	958		100	955	
V/C Ratio(X)	0.59	0.00		0.81	0.00		0.47	1.48		0.76	1.10	
Avail Cap(c_a), veh/h	153	0		184	0		101	958		101	955	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	69.6	0.0	0.0	72.3	0.0	0.0	51.0	19.7	0.0	57.4	18.9	0.0
Incr Delay (d2), s/veh	5.9	0.0	0.0	23.2	0.0	0.0	4.0	221.1	0.0	27.4	58.7	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	0.0	0.0	7.5	0.0	0.0	1.4	88.5	0.0	3.9	44.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.5	0.0	0.0	95.5	0.0	0.0	55.0	240.9	0.0	84.8	77.6	0.0
LnGrp LOS	E	A		F	A		E	F		F	F	
Approach Vol, veh/h		90			149			1458			1122	
Approach Delay, s/veh		75.5			95.5			235.6			78.1	
Approach LOS		E			F			F			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	130.6		25.0	11.0	129.0		25.0				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	5.5	123.5		19.5	5.5	123.5		19.5				
Max Q Clear Time (g_c+I1), s	3.1	129.1		21.7	5.6	127.5		18.1				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay	160.4
HCM 6th LOS	F

Notes

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

HCM 6th TWSC  
5: Driveway & Hualalai Rd

06/15/2023

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	4	85	4	4	208	8	17	0	3	3	0	3
Future Vol, veh/h	4	85	4	4	208	8	17	0	3	3	0	3
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	-	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	104	5	5	254	10	21	0	4	4	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	264	0	0	109	0	0	388	391	107	388	388	259
Stage 1	-	-	-	-	-	-	117	117	-	269	269	-
Stage 2	-	-	-	-	-	-	271	274	-	119	119	-
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	1300	-	-	1481	-	-	571	545	947	571	547	780
Stage 1	-	-	-	-	-	-	888	799	-	737	687	-
Stage 2	-	-	-	-	-	-	735	683	-	885	797	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1300	-	-	1481	-	-	565	541	947	566	543	780
Mov Cap-2 Maneuver	-	-	-	-	-	-	565	541	-	566	543	-
Stage 1	-	-	-	-	-	-	884	796	-	734	685	-
Stage 2	-	-	-	-	-	-	729	681	-	878	794	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.1	11.2	10.6
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	601	1300	-	-	1481	-	-	656
HCM Lane V/C Ratio	0.041	0.004	-	-	0.003	-	-	0.011
HCM Control Delay (s)	11.2	7.8	0	-	7.4	-	-	10.6
HCM Lane LOS	B	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0



Intersection						
Int Delay, s/veh	1.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	40	71	174	1454	1071	27
Future Vol, veh/h	40	71	174	1454	1071	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	130	0	420	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	3	6	2
Mvmt Flow	43	77	189	1580	1164	29

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	3122	-	1164	0	0
Stage 1	1164	-	-	-	-
Stage 2	1958	-	-	-	-
Critical Hdwy	6.42	-	4.13	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	-	2.227	-	-
Pot Cap-1 Maneuver	~ 13	0	597	-	-
Stage 1	297	0	-	-	-
Stage 2	120	0	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	~ 9	-	597	-	-
Mov Cap-2 Maneuver	96	-	-	-	-
Stage 1	203	-	-	-	-
Stage 2	120	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	70.4	1.5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	597	-	96	-	-	-
HCM Lane V/C Ratio	0.317	-	0.453	-	-	-
HCM Control Delay (s)	13.8	-	70.4	0	-	-
HCM Lane LOS	B	-	F	A	-	-
HCM 95th %tile Q(veh)	1.4	-	1.9	-	-	-

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

HCM 6th TWSC  
7: Queen Kaahumanu Hwy & Kuakini Hwy

06/15/2023

Intersection						
Int Delay, s/veh	4.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	13	339	445	1228	1041	63
Future Vol, veh/h	13	339	445	1228	1041	63
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	150	0	450	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	4	4	6	2
Mvmt Flow	14	357	468	1293	1096	66

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	3326	-	1097	0	0
Stage 1	1097	-	-	-	-
Stage 2	2229	-	-	-	-
Critical Hdwy	6.42	-	4.14	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	-	2.236	-	-
Pot Cap-1 Maneuver	~ 9	0	629	-	-
Stage 1	320	0	-	-	-
Stage 2	88	0	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	~ 2	-	628	-	-
Mov Cap-2 Maneuver	54	-	-	-	-
Stage 1	82	-	-	-	-
Stage 2	88	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	92.9	6.8	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	628	-	54	-	-	-
HCM Lane V/C Ratio	0.746	-	0.253	-	-	-
HCM Control Delay (s)	25.6	-	92.9	0	-	-
HCM Lane LOS	D	-	F	A	-	-
HCM 95th %tile Q(veh)	6.6	-	0.9	-	-	-

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

# HCM 6th Signalized Intersection Summary

## 1: Kuakini Hwy & Hualalai Rd

06/15/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	183	28	29	74	45	198	28	655	62	192	895	292
Future Volume (veh/h)	183	28	29	74	45	198	28	655	62	192	895	292
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.98	1.00		1.00	1.00		0.96
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	1477	1477	1870	1870	1477	1870	1870	1477	1870	1870	1575	1870
Adj Flow Rate, veh/h	185	28	21	75	45	71	28	662	0	194	904	194
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	213	171	128	312	63	99	111	1519		480	912	883
Arrive On Green	0.15	0.22	0.21	0.06	0.12	0.11	0.03	0.54	0.00	0.07	0.58	0.58
Sat Flow, veh/h	1406	781	586	1781	510	804	1781	2879	0	1781	1575	1525
Grp Volume(v), veh/h	185	0	49	75	0	116	28	662	0	194	904	194
Grp Sat Flow(s),veh/h/ln	1406	0	1366	1781	0	1314	1781	1403	0	1781	1575	1525
Q Serve(g_s), s	18.6	0.0	4.2	5.2	0.0	12.3	1.0	20.5	0.0	6.7	82.2	8.9
Cycle Q Clear(g_c), s	18.6	0.0	4.2	5.2	0.0	12.3	1.0	20.5	0.0	6.7	82.2	8.9
Prop In Lane	1.00		0.43	1.00		0.61	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	213	0	299	312	0	162	111	1519		480	912	883
V/C Ratio(X)	0.87	0.00	0.16	0.24	0.00	0.72	0.25	0.44		0.40	0.99	0.22
Avail Cap(c_a), veh/h	249	0	299	528	0	281	309	1519		611	912	883
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.1	0.0	46.1	51.3	0.0	61.6	34.5	19.9	0.0	13.9	30.2	14.7
Incr Delay (d2), s/veh	23.5	0.0	0.1	0.1	0.0	2.2	0.4	0.9	0.0	0.2	27.8	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	0.0	1.5	2.4	0.0	4.3	0.5	7.0	0.0	2.7	37.4	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	83.6	0.0	46.2	51.4	0.0	63.8	35.0	20.9	0.0	14.1	57.9	15.3
LnGrp LOS	F	A	D	D	A	E	C	C		B	E	B
Approach Vol, veh/h		234			191			690			1292	
Approach Delay, s/veh		75.8			58.9			21.4			45.0	
Approach LOS		E			E			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.9	88.0	26.3	21.9	14.3	82.5	12.4	35.7				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	19.5	49.5	24.5	29.5	19.5	49.5	24.5	29.5				
Max Q Clear Time (g_c+I1), s	3.0	84.2	20.6	14.3	8.7	22.5	7.2	6.2				
Green Ext Time (p_c), s	0.0	0.0	0.2	0.3	0.1	2.8	0.0	0.1				

### Intersection Summary

HCM 6th Ctrl Delay	42.3
HCM 6th LOS	D

### Notes

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

HCM 6th TWSC  
2: Kuakini Hwy & North Entrance

06/15/2023

Intersection						
Int Delay, s/veh	1.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↖		↙	↗
Traffic Vol, veh/h	23	82	537	23	59	844
Future Vol, veh/h	23	82	537	23	59	844
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	100	-	-	120	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	87	571	24	63	898

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1609	585	0	0	597	0
Stage 1	585	-	-	-	-	-
Stage 2	1024	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	115	511	-	-	980	-
Stage 1	557	-	-	-	-	-
Stage 2	347	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	107	510	-	-	978	-
Mov Cap-2 Maneuver	107	-	-	-	-	-
Stage 1	556	-	-	-	-	-
Stage 2	325	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.1	0	0.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	107	510	978
HCM Lane V/C Ratio	-	-	0.229	0.171	0.064
HCM Control Delay (s)	-	-	48.3	13.5	8.9
HCM Lane LOS	-	-	E	B	A
HCM 95th %tile Q(veh)	-	-	0.8	0.6	0.2

Intersection						
Int Delay, s/veh	5.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	101	88	101	16	14	140
Future Vol, veh/h	101	88	101	16	14	140
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	3
Mvmt Flow	111	97	111	18	15	154

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	129	0	-	0	439 120
Stage 1	-	-	-	-	120 -
Stage 2	-	-	-	-	319 -
Critical Hdwy	4.12	-	-	-	6.42 6.23
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.327
Pot Cap-1 Maneuver	1457	-	-	-	575 929
Stage 1	-	-	-	-	905 -
Stage 2	-	-	-	-	737 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1457	-	-	-	531 929
Mov Cap-2 Maneuver	-	-	-	-	531 -
Stage 1	-	-	-	-	836 -
Stage 2	-	-	-	-	737 -

Approach	EB	WB	SB
HCM Control Delay, s	4.1	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1457	-	-	-	870
HCM Lane V/C Ratio	0.076	-	-	-	0.195
HCM Control Delay (s)	7.7	-	-	-	10.1
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.7

# HCM 6th Signalized Intersection Summary

## 4: Queen Kaahumanu Hwy & Nani Kailua Dr

06/15/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (veh/h)	58	51	14	41	44	136	25	1061	44	149	1275	98
Future Volume (veh/h)	58	51	14	41	44	136	25	1061	44	149	1275	98
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		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	1870	1870	1870	1870	1870	1856	1477	1259	1870	1442	1280	1870
Adj Flow Rate, veh/h	63	55	0	45	48	0	27	1153	0	162	1386	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	3	2	4	2	5	2	2
Cap, veh/h	112	72		94	82		83	992		94	1019	
Arrive On Green	0.10	0.10	0.00	0.10	0.10	0.00	0.03	0.79	0.00	0.04	0.80	0.00
Sat Flow, veh/h	753	700	1585	623	848	1572	1406	1259	1585	1373	1280	1585
Grp Volume(v), veh/h	118	0	0	93	0	0	27	1153	0	162	1386	0
Grp Sat Flow(s),veh/h/ln	1453	0	1585	1470	0	1572	1406	1259	1585	1373	1280	1585
Q Serve(g_s), s	3.2	0.0	0.0	0.0	0.0	0.0	0.6	126.5	0.0	5.7	127.8	0.0
Cycle Q Clear(g_c), s	13.0	0.0	0.0	9.8	0.0	0.0	0.6	126.5	0.0	5.7	127.8	0.0
Prop In Lane	0.53		1.00	0.48		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	185	0		176	0		83	992		94	1019	
V/C Ratio(X)	0.64	0.00		0.53	0.00		0.33	1.16		1.73	1.36	
Avail Cap(c_a), veh/h	227	0		219	0		95	992		94	1019	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	70.5	0.0	0.0	69.7	0.0	0.0	52.2	17.1	0.0	62.1	16.4	0.0
Incr Delay (d2), s/veh	4.1	0.0	0.0	2.4	0.0	0.0	2.2	84.4	0.0	369.9	168.7	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	0.0	0.0	3.9	0.0	0.0	0.9	51.0	0.0	13.4	75.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.6	0.0	0.0	72.1	0.0	0.0	54.4	101.4	0.0	432.0	185.1	0.0
LnGrp LOS	E	A		E	A		D	F		F	F	
Approach Vol, veh/h		118			93			1180			1548	
Approach Delay, s/veh		74.6			72.1			100.4			211.0	
Approach LOS		E			E			F			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.7	131.3		20.6	10.0	130.0		20.6				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	4.5	124.5		19.5	4.5	124.5		19.5				
Max Q Clear Time (g_c+I1), s	2.6	129.8		11.8	7.7	128.5		15.0				
Green Ext Time (p_c), s	0.0	0.0		0.2	0.0	0.0		0.2				

### Intersection Summary

HCM 6th Ctrl Delay	156.7
HCM 6th LOS	F

### Notes

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

HCM 6th TWSC  
5: Driveway & Hualalai Rd

06/15/2023

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	5	106	21	8	103	1	15	0	2	3	0	2
Future Vol, veh/h	5	106	21	8	103	1	15	0	2	3	0	2
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	-	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	128	25	10	124	1	18	0	2	4	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	125	0	0	153	0	0	299	298	141	299	310	125
Stage 1	-	-	-	-	-	-	153	153	-	145	145	-
Stage 2	-	-	-	-	-	-	146	145	-	154	165	-
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	1462	-	-	1428	-	-	653	614	907	653	605	926
Stage 1	-	-	-	-	-	-	849	771	-	858	777	-
Stage 2	-	-	-	-	-	-	857	777	-	848	762	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1462	-	-	1428	-	-	646	607	907	646	598	926
Mov Cap-2 Maneuver	-	-	-	-	-	-	646	607	-	646	598	-
Stage 1	-	-	-	-	-	-	846	768	-	855	772	-
Stage 2	-	-	-	-	-	-	849	772	-	842	759	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0.5			10.6			9.9		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	669	1462	-	-	1428	-	-	735
HCM Lane V/C Ratio	0.031	0.004	-	-	0.007	-	-	0.008
HCM Control Delay (s)	10.6	7.5	0	-	7.5	-	-	9.9
HCM Lane LOS	B	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	16	96	79	1111	1304	19
Future Vol, veh/h	16	96	79	1111	1304	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	130	0	420	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	4	3	2
Mvmt Flow	17	103	85	1195	1402	20

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	2767	-	1402	0	0
Stage 1	1402	-	-	-	-
Stage 2	1365	-	-	-	-
Critical Hdwy	6.42	-	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	-	2.218	-	-
Pot Cap-1 Maneuver	21	0	487	-	-
Stage 1	228	0	-	-	-
Stage 2	237	0	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	~ 17	-	487	-	-
Mov Cap-2 Maneuver	137	-	-	-	-
Stage 1	188	-	-	-	-
Stage 2	237	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	35	0.9	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	487	-	137	-	-	-
HCM Lane V/C Ratio	0.174	-	0.126	-	-	-
HCM Control Delay (s)	13.9	-	35	0	-	-
HCM Lane LOS	B	-	E	A	-	-
HCM 95th %tile Q(veh)	0.6	-	0.4	-	-	-

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



HCM 6th TWSC  
7: Queen Kaahumanu Hwy & Kuakini Hwy

06/15/2023

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	19	816	291	1050	1138	35
Future Vol, veh/h	19	816	291	1050	1138	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	150	0	450	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	3	3	2
Mvmt Flow	20	850	303	1094	1185	36

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	2885	-	1185	0	0
Stage 1	1185	-	-	-	-
Stage 2	1700	-	-	-	-
Critical Hdwy	6.42	-	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	-	2.218	-	-
Pot Cap-1 Maneuver	~ 18	0	589	-	-
Stage 1	290	0	-	-	-
Stage 2	162	0	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	~ 9	-	589	-	-
Mov Cap-2 Maneuver	98	-	-	-	-
Stage 1	141	-	-	-	-
Stage 2	162	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	50.8	3.8	0
HCM LOS	F		























Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	589	-	98	-	-	-
HCM Lane V/C Ratio	0.515	-	0.202	-	-	-
HCM Control Delay (s)	17.4	-	50.8	0	-	-
HCM Lane LOS	C	-	F	A	-	-
HCM 95th %tile Q(veh)	2.9	-	0.7	-	-	-

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

# HCM 6th Signalized Intersection Summary

## 1: Kuakini Hwy & Hualalai Rd

06/15/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	250	48	29	66	46	232	24	722	57	146	437	179
Future Volume (veh/h)	250	48	29	66	46	232	24	722	57	146	437	179
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		0.98	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	1453	1477	1870	1870	1477	1856	1870	1477	1870	1870	1477	1841
Adj Flow Rate, veh/h	263	51	23	69	48	109	25	760	0	154	460	83
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	2	2	2	2	3	2	2	2	2	2	4
Cap, veh/h	218	251	113	355	62	141	376	1365		384	769	811
Arrive On Green	0.16	0.26	0.25	0.05	0.16	0.14	0.03	0.49	0.00	0.07	0.52	0.52
Sat Flow, veh/h	1384	962	434	1781	396	900	1781	2879	0	1781	1477	1558
Grp Volume(v), veh/h	263	0	74	69	0	157	25	760	0	154	460	83
Grp Sat Flow(s),veh/h/ln	1384	0	1396	1781	0	1297	1781	1403	0	1781	1477	1558
Q Serve(g_s), s	19.7	0.0	5.2	4.0	0.0	14.6	0.9	23.8	0.0	5.1	27.1	3.4
Cycle Q Clear(g_c), s	19.7	0.0	5.2	4.0	0.0	14.6	0.9	23.8	0.0	5.1	27.1	3.4
Prop In Lane	1.00		0.31	1.00		0.69	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	218	0	364	355	0	202	376	1365		384	769	811
V/C Ratio(X)	1.21	0.00	0.20	0.19	0.00	0.78	0.07	0.56		0.40	0.60	0.10
Avail Cap(c_a), veh/h	218	0	364	541	0	270	541	1365		488	769	811
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.6	0.0	36.3	40.9	0.0	51.2	16.9	22.6	0.0	16.2	20.9	15.2
Incr Delay (d2), s/veh	127.7	0.0	0.1	0.1	0.0	6.7	0.0	1.6	0.0	0.3	3.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.6	0.0	1.8	1.8	0.0	5.2	0.4	8.2	0.0	2.1	10.1	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	180.3	0.0	36.4	41.0	0.0	57.8	17.0	24.2	0.0	16.5	24.3	15.4
LnGrp LOS	F	A	D	D	A	E	B	C		B	C	B
Approach Vol, veh/h		337			226			785			697	
Approach Delay, s/veh		148.7			52.7			24.0			21.5	
Approach LOS		F			D			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.4	69.1	24.0	23.5	12.7	64.8	11.0	36.6				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	14.5	45.5	18.5	24.5	14.5	45.5	18.5	24.5				
Max Q Clear Time (g_c+I1), s	2.9	29.1	21.7	16.6	7.1	25.8	6.0	7.2				
Green Ext Time (p_c), s	0.0	2.2	0.0	0.3	0.1	3.1	0.0	0.2				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			46.9									
HCM 6th LOS			D									
<b>Notes</b>												
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th TWSC  
2: Kuakini Hwy & North Entrance

06/15/2023

Intersection						
Int Delay, s/veh	2.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	18	63	678	68	102	368
Future Vol, veh/h	18	63	678	68	102	368
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	100	-	-	120	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	3	2	2	2
Mvmt Flow	21	75	807	81	121	438

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1528	850	0	0	888
Stage 1	848	-	-	-	-
Stage 2	680	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	129	360	-	-	763
Stage 1	420	-	-	-	-
Stage 2	503	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	108	359	-	-	763
Mov Cap-2 Maneuver	108	-	-	-	-
Stage 1	420	-	-	-	-
Stage 2	423	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	24.1	0	2.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	108	359	763
HCM Lane V/C Ratio	-	-	0.198	0.209	0.159
HCM Control Delay (s)	-	-	46.4	17.7	10.6
HCM Lane LOS	-	-	E	C	B
HCM 95th %tile Q(veh)	-	-	0.7	0.8	0.6

HCM 6th TWSC  
3: Hualalai Rd & Nani Kailua Rd

06/15/2023

Intersection						
Int Delay, s/veh	4.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	69	79	197	15	28	130
Future Vol, veh/h	69	79	197	15	28	130
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	77	88	219	17	31	144

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	236	0	-	0	470 228
Stage 1	-	-	-	-	228 -
Stage 2	-	-	-	-	242 -
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	1331	-	-	-	552 811
Stage 1	-	-	-	-	810 -
Stage 2	-	-	-	-	798 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1331	-	-	-	520 811
Mov Cap-2 Maneuver	-	-	-	-	520 -
Stage 1	-	-	-	-	763 -
Stage 2	-	-	-	-	798 -

Approach	EB	WB	SB
HCM Control Delay, s	3.7	0	11.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1331	-	-	-	738
HCM Lane V/C Ratio	0.058	-	-	-	0.238
HCM Control Delay (s)	7.9	-	-	-	11.4
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.9

HCM 6th Signalized Intersection Summary  
 4: Queen Kaahumanu Hwy & Nani Kailua Dr

06/15/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↑	↕	↕	↕	↕
Traffic Volume (veh/h)	64	27	22	70	74	212	39	1360	49	73	1004	77
Future Volume (veh/h)	64	27	22	70	74	212	39	1360	49	73	1004	77
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		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	1870	1477	1870	1870	1477	1856	1477	1259	1870	1477	1239	1870
Adj Flow Rate, veh/h	67	28	0	73	77	0	41	1417	0	76	1046	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	3	2	4	2	2	6	2
Cap, veh/h	114	38		104	79		86	958		100	955	
Arrive On Green	0.13	0.13	0.00	0.12	0.12	0.00	0.03	0.76	0.00	0.04	0.77	0.00
Sat Flow, veh/h	600	301	1585	586	648	1572	1406	1259	1585	1406	1239	1585
Grp Volume(v), veh/h	95	0	0	150	0	0	41	1417	0	76	1046	0
Grp Sat Flow(s),veh/h/ln	901	0	1585	1234	0	1572	1406	1259	1585	1406	1239	1585
Q Serve(g_s), s	0.0	0.0	0.0	2.8	0.0	0.0	1.1	125.5	0.0	3.6	127.1	0.0
Cycle Q Clear(g_c), s	17.2	0.0	0.0	20.0	0.0	0.0	1.1	125.5	0.0	3.6	127.1	0.0
Prop In Lane	0.71		1.00	0.49		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	152	0		182	0		86	958		100	955	
V/C Ratio(X)	0.63	0.00		0.82	0.00		0.47	1.48		0.76	1.10	
Avail Cap(c_a), veh/h	152	0		182	0		101	958		101	955	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	70.1	0.0	0.0	72.5	0.0	0.0	51.0	19.7	0.0	57.4	18.9	0.0
Incr Delay (d2), s/veh	7.8	0.0	0.0	25.4	0.0	0.0	4.0	221.1	0.0	27.4	58.7	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.0	0.0	7.7	0.0	0.0	1.4	88.5	0.0	3.9	44.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	77.9	0.0	0.0	97.9	0.0	0.0	55.0	240.9	0.0	84.8	77.6	0.0
LnGrp LOS	E	A		F	A		E	F		F	F	
Approach Vol, veh/h		95			150			1458			1122	
Approach Delay, s/veh		77.9			97.9			235.6			78.1	
Approach LOS		E			F			F			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	130.6		25.0	11.0	129.0		25.0				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	5.5	123.5		19.5	5.5	123.5		19.5				
Max Q Clear Time (g_c+I1), s	3.1	129.1		22.0	5.6	127.5		19.2				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay	160.4
HCM 6th LOS	F

Notes

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

HCM 6th TWSC  
5: Driveway & Hualalai Rd

06/15/2023

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	4	85	4	4	208	8	17	0	3	3	0	3
Future Vol, veh/h	4	85	4	4	208	8	17	0	3	3	0	3
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	-	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	104	5	5	254	10	21	0	4	4	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	264	0	0	109	0	0	388	391	107	388	388	259
Stage 1	-	-	-	-	-	-	117	117	-	269	269	-
Stage 2	-	-	-	-	-	-	271	274	-	119	119	-
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	1300	-	-	1481	-	-	571	545	947	571	547	780
Stage 1	-	-	-	-	-	-	888	799	-	737	687	-
Stage 2	-	-	-	-	-	-	735	683	-	885	797	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1300	-	-	1481	-	-	565	541	947	566	543	780
Mov Cap-2 Maneuver	-	-	-	-	-	-	565	541	-	566	543	-
Stage 1	-	-	-	-	-	-	884	796	-	734	685	-
Stage 2	-	-	-	-	-	-	729	681	-	878	794	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0.1			11.2			10.6		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	601	1300	-	-	1481	-	-	656
HCM Lane V/C Ratio	0.041	0.004	-	-	0.003	-	-	0.011
HCM Control Delay (s)	11.2	7.8	0	-	7.4	-	-	10.6
HCM Lane LOS	B	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

HCM 6th TWSC  
6: Queen Kaahumanu Hwy & Hualalai Rd

06/15/2023

Intersection						
Int Delay, s/veh	1.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	40	71	174	1454	1071	27
Future Vol, veh/h	40	71	174	1454	1071	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	130	0	420	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	3	6	2
Mvmt Flow	43	77	189	1580	1164	29

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	3122	-	1164	0	0
Stage 1	1164	-	-	-	-
Stage 2	1958	-	-	-	-
Critical Hdwy	6.42	-	4.13	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	-	2.227	-	-
Pot Cap-1 Maneuver	~ 13	0	597	-	-
Stage 1	297	0	-	-	-
Stage 2	120	0	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	~ 9	-	597	-	-
Mov Cap-2 Maneuver	96	-	-	-	-
Stage 1	203	-	-	-	-
Stage 2	120	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	70.4	1.5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	597	-	96	-	-	-
HCM Lane V/C Ratio	0.317	-	0.453	-	-	-
HCM Control Delay (s)	13.8	-	70.4	0	-	-
HCM Lane LOS	B	-	F	A	-	-
HCM 95th %tile Q(veh)	1.4	-	1.9	-	-	-

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

HCM 6th TWSC  
7: Queen Kaahumanu Hwy & Kuakini Hwy

06/15/2023

Intersection						
Int Delay, s/veh	4.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↗	↗	↗
Traffic Vol, veh/h	15	367	454	1228	1041	64
Future Vol, veh/h	15	367	454	1228	1041	64
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	150	0	450	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	4	4	6	2
Mvmt Flow	16	386	478	1293	1096	67

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	3346	-	1097	0	0
Stage 1	1097	-	-	-	-
Stage 2	2249	-	-	-	-
Critical Hdwy	6.42	-	4.14	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	-	2.236	-	-
Pot Cap-1 Maneuver	~ 9	0	629	-	-
Stage 1	320	0	-	-	-
Stage 2	86	0	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	~ 2	-	628	-	-
Mov Cap-2 Maneuver	52	-	-	-	-
Stage 1	76	-	-	-	-
Stage 2	86	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	102	7.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	628	-	52	-	-	-
HCM Lane V/C Ratio	0.761	-	0.304	-	-	-
HCM Control Delay (s)	26.6	-	102	0	-	-
HCM Lane LOS	D	-	F	A	-	-
HCM 95th %tile Q(veh)	7	-	1.1	-	-	-

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



HCM 6th TWSC  
 9: Kuakini Hwy & South Entrance

06/15/2023

Intersection						
Int Delay, s/veh	1.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↖		↙	↗
Traffic Vol, veh/h	28	47	699	9	15	371
Future Vol, veh/h	28	47	699	9	15	371
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	0	-	-	0	-
Veh in Median Storage, #	2	-	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	30	51	760	10	16	403

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1200	765	0	0	770	0
Stage 1	765	-	-	-	-	-
Stage 2	435	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	204	403	-	-	844	-
Stage 1	459	-	-	-	-	-
Stage 2	653	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	200	403	-	-	844	-
Mov Cap-2 Maneuver	392	-	-	-	-	-
Stage 1	459	-	-	-	-	-
Stage 2	641	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.1	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	392	403	844	-
HCM Lane V/C Ratio	-	-	0.078	0.127	0.019	-
HCM Control Delay (s)	-	-	15	15.2	9.3	-
HCM Lane LOS	-	-	C	C	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0.4	0.1	-

# HCM 6th Signalized Intersection Summary

## 1: Kuakini Hwy & Hualalai Rd

06/15/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	183	28	32	79	45	198	29	673	64	192	954	292
Future Volume (veh/h)	183	28	32	79	45	198	29	673	64	192	954	292
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.98	1.00		1.00	1.00		0.96
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	1477	1477	1870	1870	1477	1870	1870	1477	1870	1870	1575	1870
Adj Flow Rate, veh/h	185	28	24	80	45	71	29	680	0	194	964	194
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	213	158	136	316	63	99	107	1519		471	911	882
Arrive On Green	0.15	0.22	0.21	0.06	0.12	0.11	0.03	0.54	0.00	0.07	0.58	0.58
Sat Flow, veh/h	1406	731	627	1781	510	804	1781	2879	0	1781	1575	1525
Grp Volume(v), veh/h	185	0	52	80	0	116	29	680	0	194	964	194
Grp Sat Flow(s),veh/h/ln	1406	0	1358	1781	0	1314	1781	1403	0	1781	1575	1525
Q Serve(g_s), s	18.6	0.0	4.5	5.6	0.0	12.3	1.0	21.3	0.0	6.7	83.9	8.9
Cycle Q Clear(g_c), s	18.6	0.0	4.5	5.6	0.0	12.3	1.0	21.3	0.0	6.7	83.9	8.9
Prop In Lane	1.00		0.46	1.00		0.61	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	213	0	294	316	0	162	107	1519		471	911	882
V/C Ratio(X)	0.87	0.00	0.18	0.25	0.00	0.72	0.27	0.45		0.41	1.06	0.22
Avail Cap(c_a), veh/h	249	0	294	527	0	281	304	1519		603	911	882
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.1	0.0	46.6	51.1	0.0	61.6	34.6	20.1	0.0	14.1	30.6	14.8
Incr Delay (d2), s/veh	23.5	0.0	0.1	0.2	0.0	2.2	0.5	1.0	0.0	0.2	46.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	0.0	1.6	2.6	0.0	4.3	0.6	7.3	0.0	2.7	42.7	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	83.6	0.0	46.7	51.2	0.0	63.8	35.1	21.1	0.0	14.3	76.9	15.3
LnGrp LOS	F	A	D	D	A	E	D	C		B	F	B
Approach Vol, veh/h		237			196			709			1352	
Approach Delay, s/veh		75.5			58.7			21.6			59.1	
Approach LOS		E			E			C			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.9	87.9	26.3	21.9	14.3	82.5	12.8	35.3				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	19.5	49.5	24.5	29.5	19.5	49.5	24.5	29.5				
Max Q Clear Time (g_c+I1), s	3.0	85.9	20.6	14.3	8.7	23.3	7.6	6.5				
Green Ext Time (p_c), s	0.0	0.0	0.2	0.3	0.1	2.9	0.0	0.1				

### Intersection Summary

HCM 6th Ctrl Delay	50.0
HCM 6th LOS	D

### Notes

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

HCM 6th TWSC  
 2: Kuakini Hwy & North Entrance

06/15/2023

Intersection						
Int Delay, s/veh	2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↖		↙	↗
Traffic Vol, veh/h	25	86	553	30	73	898
Future Vol, veh/h	25	86	553	30	73	898
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	100	-	-	120	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	91	588	32	78	955

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1717	606	0	0	622
Stage 1	606	-	-	-	-
Stage 2	1111	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	99	497	-	-	959
Stage 1	545	-	-	-	-
Stage 2	315	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	91	496	-	-	957
Mov Cap-2 Maneuver	91	-	-	-	-
Stage 1	544	-	-	-	-
Stage 2	289	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	24.3	0	0.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	91	496	957
HCM Lane V/C Ratio	-	-	0.292	0.184	0.081
HCM Control Delay (s)	-	-	60.1	13.9	9.1
HCM Lane LOS	-	-	F	B	A
HCM 95th %tile Q(veh)	-	-	1.1	0.7	0.3

Intersection						
Int Delay, s/veh	5.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	103	88	101	16	14	145
Future Vol, veh/h	103	88	101	16	14	145
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	3
Mvmt Flow	113	97	111	18	15	159

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	129	0	-	0	443 120
Stage 1	-	-	-	-	120 -
Stage 2	-	-	-	-	323 -
Critical Hdwy	4.12	-	-	-	6.42 6.23
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.327
Pot Cap-1 Maneuver	1457	-	-	-	572 929
Stage 1	-	-	-	-	905 -
Stage 2	-	-	-	-	734 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1457	-	-	-	527 929
Mov Cap-2 Maneuver	-	-	-	-	527 -
Stage 1	-	-	-	-	834 -
Stage 2	-	-	-	-	734 -

Approach	EB	WB	SB
HCM Control Delay, s	4.1	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1457	-	-	-	871
HCM Lane V/C Ratio	0.078	-	-	-	0.201
HCM Control Delay (s)	7.7	-	-	-	10.2
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.7

HCM 6th Signalized Intersection Summary  
 4: Queen Kaahumanu Hwy & Nani Kailua Dr

06/15/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (veh/h)	59	52	14	41	47	136	25	1061	44	149	1275	100
Future Volume (veh/h)	59	52	14	41	47	136	25	1061	44	149	1275	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		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	1870	1870	1870	1870	1870	1856	1477	1259	1870	1442	1280	1870
Adj Flow Rate, veh/h	64	57	0	45	51	0	27	1153	0	162	1386	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	3	2	4	2	5	2	2
Cap, veh/h	113	75		93	87		83	989		93	1015	
Arrive On Green	0.11	0.11	0.00	0.10	0.10	0.00	0.03	0.79	0.00	0.04	0.79	0.00
Sat Flow, veh/h	739	701	1585	601	871	1572	1406	1259	1585	1373	1280	1585
Grp Volume(v), veh/h	121	0	0	96	0	0	27	1153	0	162	1386	0
Grp Sat Flow(s),veh/h/ln	1441	0	1585	1471	0	1572	1406	1259	1585	1373	1280	1585
Q Serve(g_s), s	3.4	0.0	0.0	0.0	0.0	0.0	0.6	126.5	0.0	5.7	127.8	0.0
Cycle Q Clear(g_c), s	13.5	0.0	0.0	10.1	0.0	0.0	0.6	126.5	0.0	5.7	127.8	0.0
Prop In Lane	0.53		1.00	0.47		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	187	0		180	0		83	989		93	1015	
V/C Ratio(X)	0.65	0.00		0.53	0.00		0.33	1.17		1.74	1.37	
Avail Cap(c_a), veh/h	225	0		218	0		94	989		93	1015	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	70.5	0.0	0.0	69.6	0.0	0.0	52.1	17.3	0.0	62.1	16.6	0.0
Incr Delay (d2), s/veh	4.7	0.0	0.0	2.4	0.0	0.0	2.3	85.9	0.0	372.3	170.7	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	0.0	0.0	4.0	0.0	0.0	0.9	51.5	0.0	13.5	76.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.2	0.0	0.0	72.0	0.0	0.0	54.3	103.2	0.0	434.4	187.3	0.0
LnGrp LOS	E	A		E	A		D	F		F	F	
Approach Vol, veh/h		121			96			1180			1548	
Approach Delay, s/veh		75.2			72.0			102.1			213.2	
Approach LOS		E			E			F			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.7	131.3		21.1	10.0	130.0		21.1				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	4.5	124.5		19.5	4.5	124.5		19.5				
Max Q Clear Time (g_c+I1), s	2.6	129.8		12.1	7.7	128.5		15.5				
Green Ext Time (p_c), s	0.0	0.0		0.2	0.0	0.0		0.2				

Intersection Summary

HCM 6th Ctrl Delay	158.4
HCM 6th LOS	F

Notes

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

HCM 6th TWSC  
5: Driveway & Hualalai Rd

06/15/2023

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	5	106	21	8	103	1	15	0	2	3	0	2
Future Vol, veh/h	5	106	21	8	103	1	15	0	2	3	0	2
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	-	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	128	25	10	124	1	18	0	2	4	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	125	0	0	153	0	0	299	298	141	299	310	125
Stage 1	-	-	-	-	-	-	153	153	-	145	145	-
Stage 2	-	-	-	-	-	-	146	145	-	154	165	-
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	1462	-	-	1428	-	-	653	614	907	653	605	926
Stage 1	-	-	-	-	-	-	849	771	-	858	777	-
Stage 2	-	-	-	-	-	-	857	777	-	848	762	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1462	-	-	1428	-	-	646	607	907	646	598	926
Mov Cap-2 Maneuver	-	-	-	-	-	-	646	607	-	646	598	-
Stage 1	-	-	-	-	-	-	846	768	-	855	772	-
Stage 2	-	-	-	-	-	-	849	772	-	842	759	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0.5			10.6			9.9		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	669	1462	-	-	1428	-	-	735
HCM Lane V/C Ratio	0.031	0.004	-	-	0.007	-	-	0.008
HCM Control Delay (s)	10.6	7.5	0	-	7.5	-	-	9.9
HCM Lane LOS	B	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

HCM 6th TWSC  
6: Queen Kaahumanu Hwy & Hualalai Rd

06/15/2023

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↘
Traffic Vol, veh/h	16	96	79	1111	1304	19
Future Vol, veh/h	16	96	79	1111	1304	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	130	0	420	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	4	3	2
Mvmt Flow	17	103	85	1195	1402	20

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	2767	-	1402	0	0
Stage 1	1402	-	-	-	-
Stage 2	1365	-	-	-	-
Critical Hdwy	6.42	-	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	-	2.218	-	-
Pot Cap-1 Maneuver	21	0	487	-	-
Stage 1	228	0	-	-	-
Stage 2	237	0	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	~ 17	-	487	-	-
Mov Cap-2 Maneuver	137	-	-	-	-
Stage 1	188	-	-	-	-
Stage 2	237	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	35	0.9	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	487	-	137	-	-	-
HCM Lane V/C Ratio	0.174	-	0.126	-	-	-
HCM Control Delay (s)	13.9	-	35	0	-	-
HCM Lane LOS	B	-	E	A	-	-
HCM 95th %tile Q(veh)	0.6	-	0.4	-	-	-

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

HCM 6th TWSC  
 7: Queen Kaahumanu Hwy & Kuakini Hwy

06/15/2023

Intersection						
Int Delay, s/veh	2.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	20	826	323	1050	1138	37
Future Vol, veh/h	20	826	323	1050	1138	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	150	0	450	-	-	500
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	3	3	2
Mvmt Flow	21	860	336	1094	1185	39

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2951	-	1185	0	-	0
Stage 1	1185	-	-	-	-	-
Stage 2	1766	-	-	-	-	-
Critical Hdwy	6.42	-	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	2.218	-	-	-
Pot Cap-1 Maneuver	~ 16	0	589	-	-	-
Stage 1	290	0	-	-	-	-
Stage 2	150	0	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 7	-	589	-	-	-
Mov Cap-2 Maneuver	88	-	-	-	-	-
Stage 1	125	-	-	-	-	-
Stage 2	150	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	58.2	4.5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	589	-	88	-	-	-
HCM Lane V/C Ratio	0.571	-	0.237	-	-	-
HCM Control Delay (s)	18.9	-	58.2	0	-	-
HCM Lane LOS	C	-	F	A	-	-
HCM 95th %tile Q(veh)	3.6	-	0.8	-	-	-

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



HCM 6th TWSC  
 9: Kuakini Hwy & South Entrance

06/15/2023

Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	16	567	32	54	869
Future Vol, veh/h	10	16	567	32	54	869
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	0	-	-	0	-
Veh in Median Storage, #	2	-	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	11	17	616	35	59	945

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1697	634	0	0	651
Stage 1	634	-	-	-	-
Stage 2	1063	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	102	479	-	-	935
Stage 1	529	-	-	-	-
Stage 2	332	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	96	479	-	-	935
Mov Cap-2 Maneuver	266	-	-	-	-
Stage 1	529	-	-	-	-
Stage 2	311	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.2	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	266	479	935	-
HCM Lane V/C Ratio	-	-	0.041	0.036	0.063	-
HCM Control Delay (s)	-	-	19.1	12.8	9.1	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	0.2	-

**APPENDIX C: SIGNAL WARRANT WORKSHEETS**





Major Street Queen Ka'ahumanu  
 Minor Street Kuakini Hwy

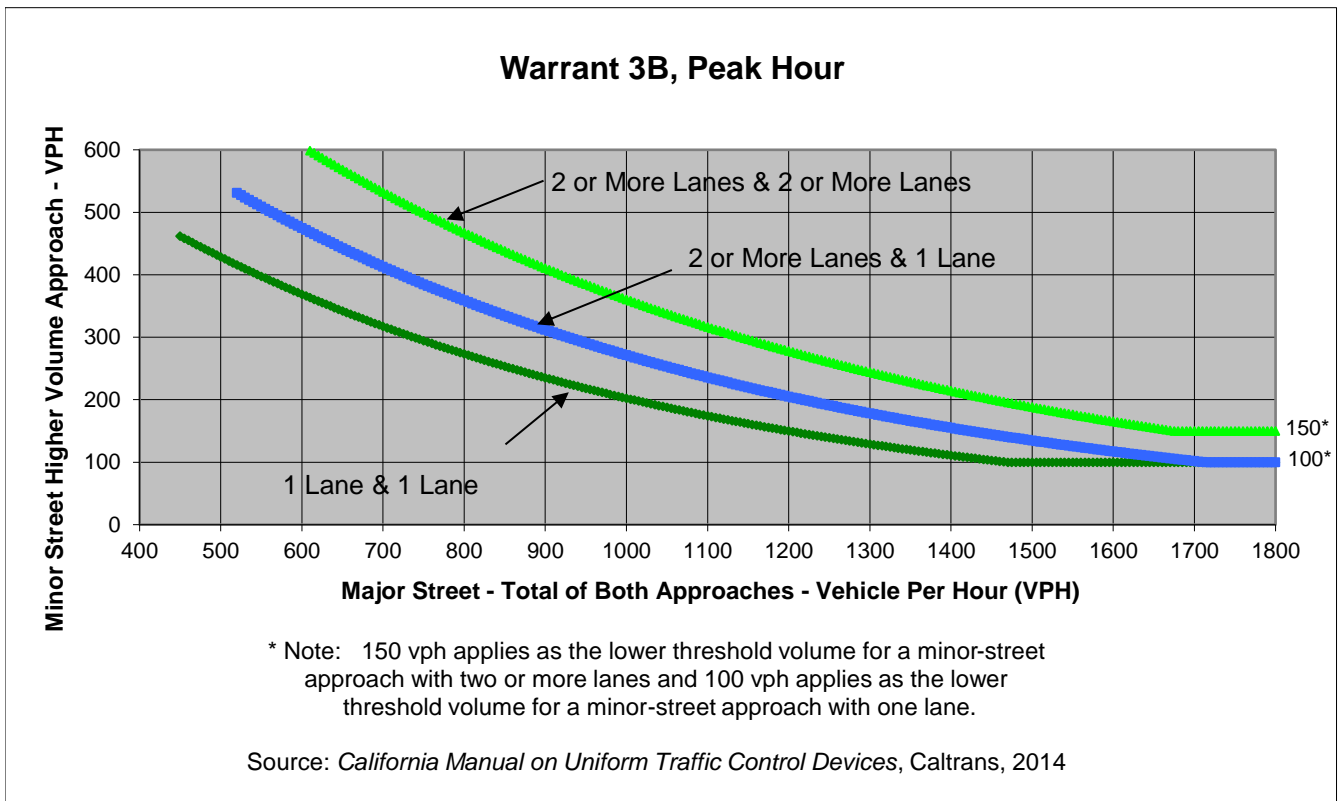
Project University of Nations Kona  
 Scenario Year 2030 + Project  
 Peak Hour PM Peak Period

Turn Movement Volumes

	NB	SB	EB	WB
Left	276	0	17	0
Through	950	1,030	0	0
Right	0	32	0	0
Total	1,226	1,062	17	0

Major Street Direction

x	North/South
	East/West



	Major Street	Minor Street	Warrant Met
	Queen Ka'ahumanu	Kuakini Hwy	
<b>Number of Approach Lanes</b>	<b>2</b>	<b>1</b>	<b>NO</b>
<b>Traffic Volume (VPH) *</b>	<b>2,288</b>	<b>17</b>	

\* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.  
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street Queen Ka'ahumanu  
 Minor Street Kuakini Hwy

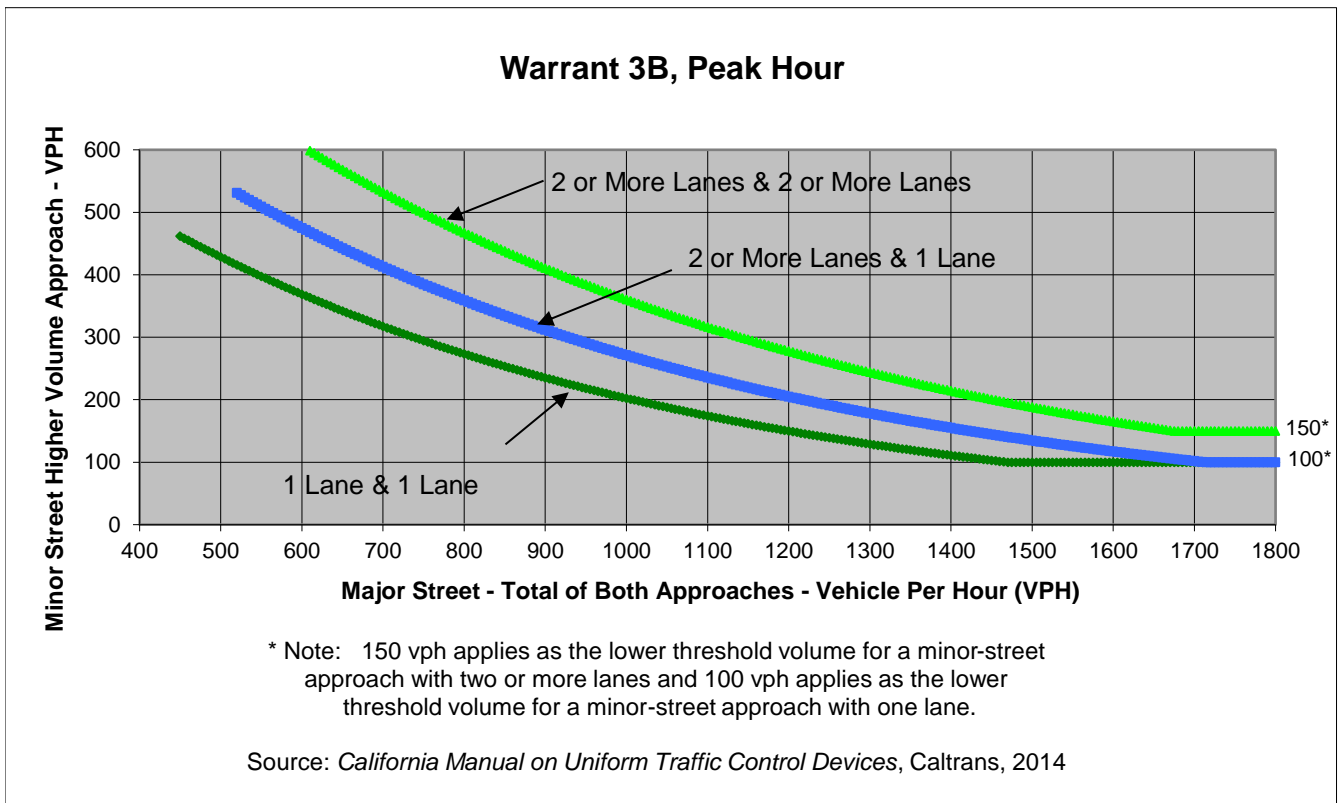
Project University of Nations Kona  
 Scenario Year 2040 + Project  
 Peak Hour PM Peak Period

Turn Movement Volumes

	NB	SB	EB	WB
Left	299	0	18	0
Through	999	1,083	0	0
Right	0	34	0	0
Total	1,298	1,117	18	0

Major Street Direction

x	North/South
	East/West



	Major Street	Minor Street	Warrant Met
	Queen Ka'ahumanu	Kuakini Hwy	
<b>Number of Approach Lanes</b>	<b>2</b>	<b>1</b>	<b><u>NO</u></b>
<b>Traffic Volume (VPH) *</b>	<b>2,415</b>	<b>18</b>	

\* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.  
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street Queen Ka'ahumanu  
 Minor Street Kuakini Hwy

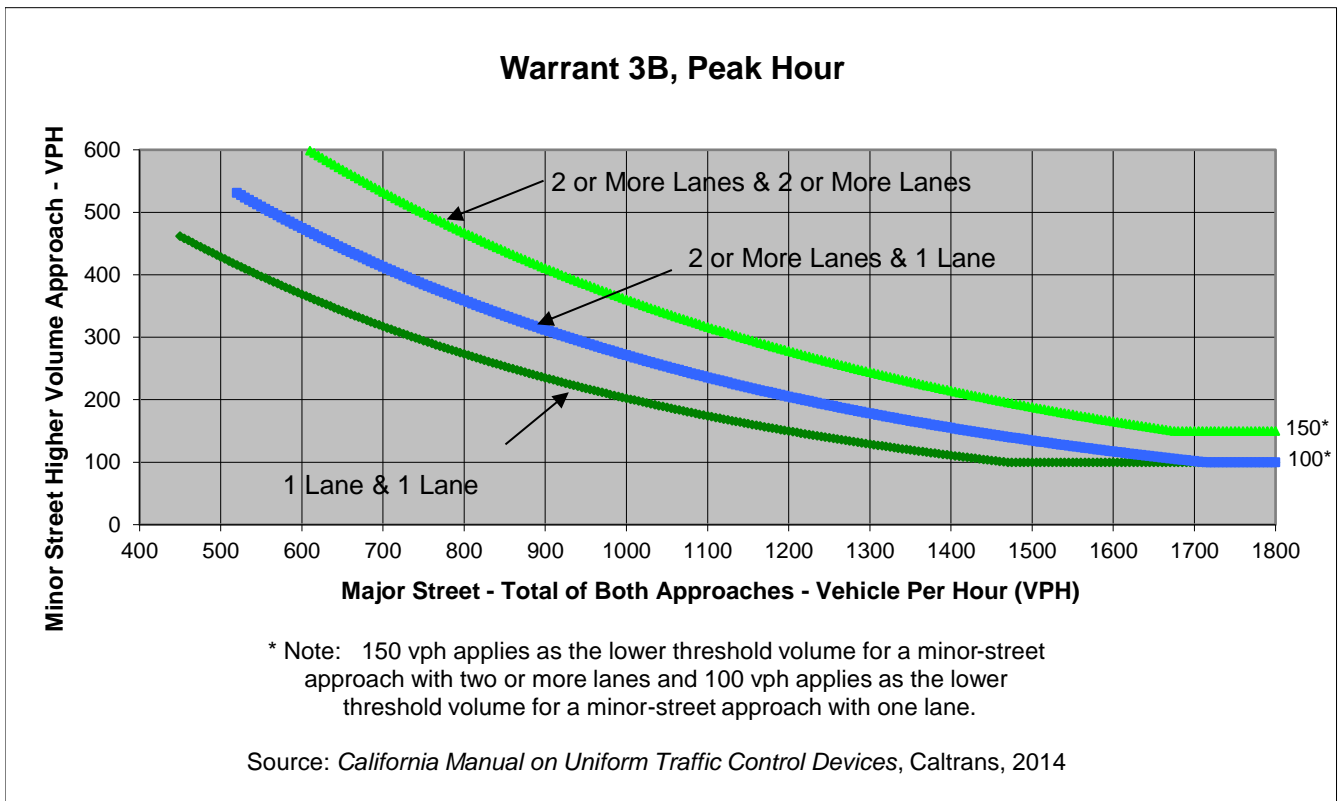
Project University of Nations Kona  
 Scenario Year 2050 + Project  
 Peak Hour PM Peak Period

Turn Movement Volumes

	NB	SB	EB	WB
Left	323	0	20	0
Through	1,050	1,138	0	0
Right	0	37	0	0
Total	1,373	1,175	20	0

Major Street Direction

x	North/South
	East/West



	Major Street	Minor Street	Warrant Met
	Queen Ka'ahumanu	Kuakini Hwy	
<b>Number of Approach Lanes</b>	<b>2</b>	<b>1</b>	<b><u>NO</u></b>
<b>Traffic Volume (VPH) *</b>	<b>2,548</b>	<b>20</b>	

\* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.  
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street Kuakini Hwy  
 Minor Street UofN Campus North Entrance

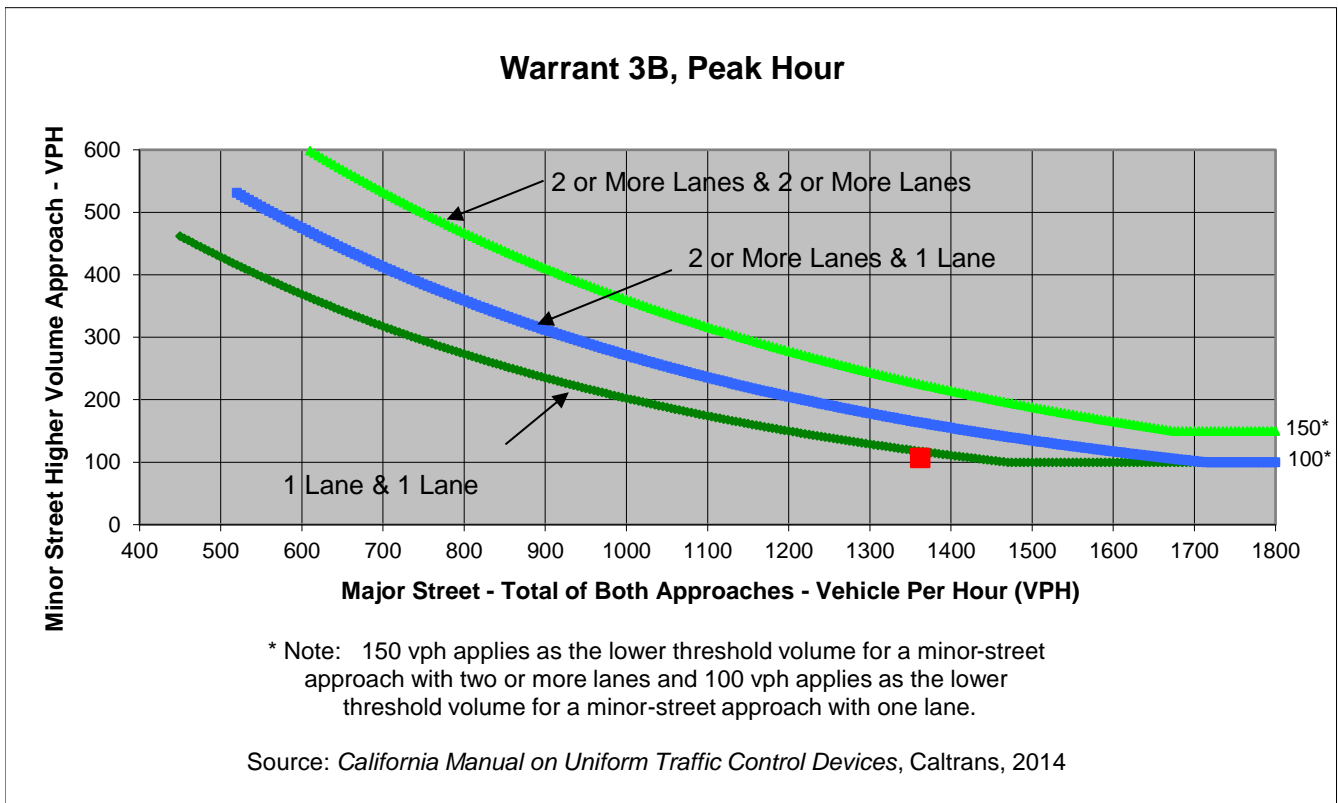
Project University of Nations Kona  
 Scenario Year 2030 + Project  
 Peak Hour PM Peak Periods

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	64	0	24
Through	490	782	0	0
Right	26	0	0	83
Total	516	846	0	107

Major Street Direction

x	North/South
	East/West



	Major Street	Minor Street	Warrant Met
	Kuakini Hwy	UofN Campus North Entrance	
<b>Number of Approach Lanes</b>	<b>2</b>	<b>1</b>	<b><u>NO</u></b>
<b>Traffic Volume (VPH) *</b>	<b>1,362</b>	<b>107</b>	

\* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.  
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street Kuakini Hwy  
 Minor Street UofN Campus North Entrance

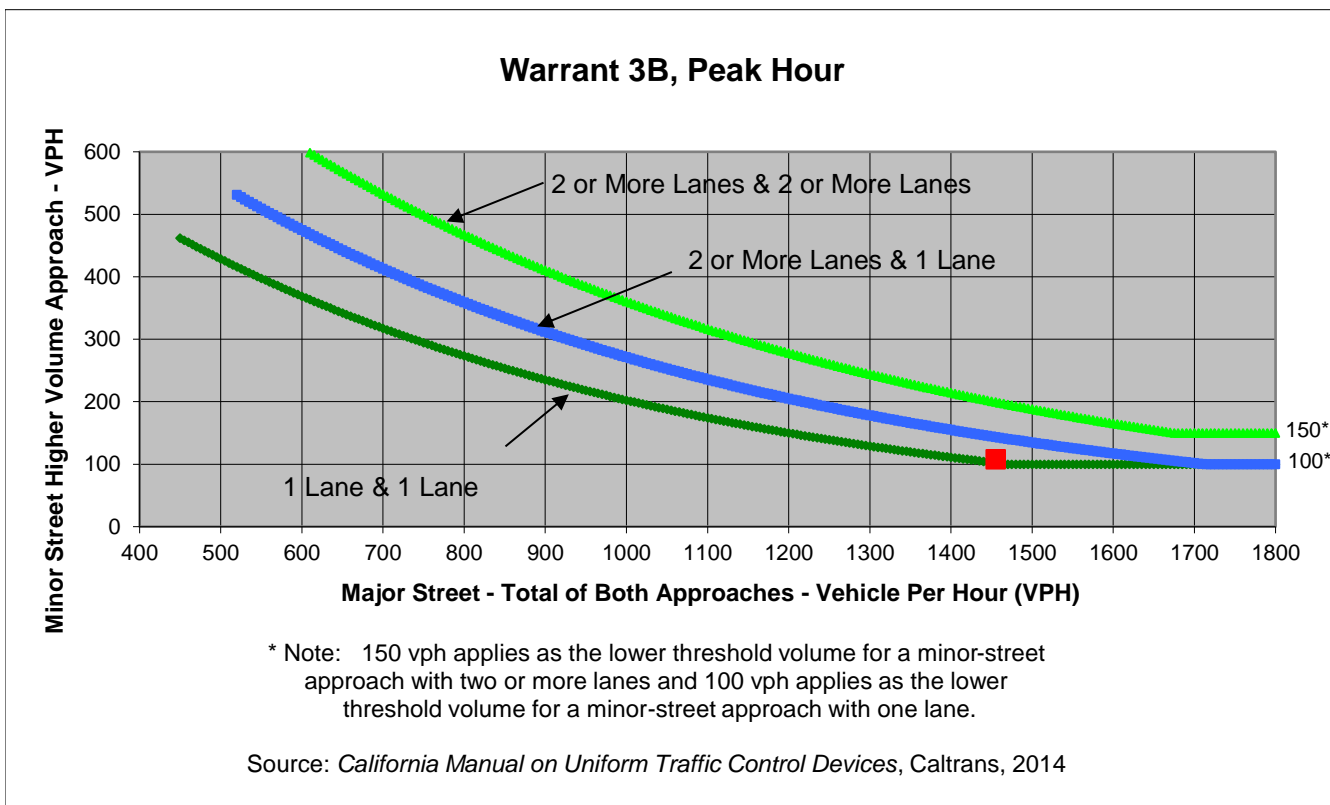
Project University of Nations Kona  
 Scenario Year 2040 + Project  
 Peak Hour PM Peak Periods

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	68	0	24
Through	520	839	0	0
Right	28	0	0	84
Total	548	907	0	108

Major Street Direction

x	North/South
	East/West



	Major Street	Minor Street	Warrant Met
	Kuakini Hwy	UofN Campus North Entrance	
<b>Number of Approach Lanes</b>	<b>2</b>	<b>1</b>	<b><u>NO</u></b>
<b>Traffic Volume (VPH) *</b>	<b>1,455</b>	<b>108</b>	

\* Note: Traffic Volume for Major Street is Total Volume of Both Approches.  
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street Kuakini Hwy  
 Minor Street UofN Campus North Entrance

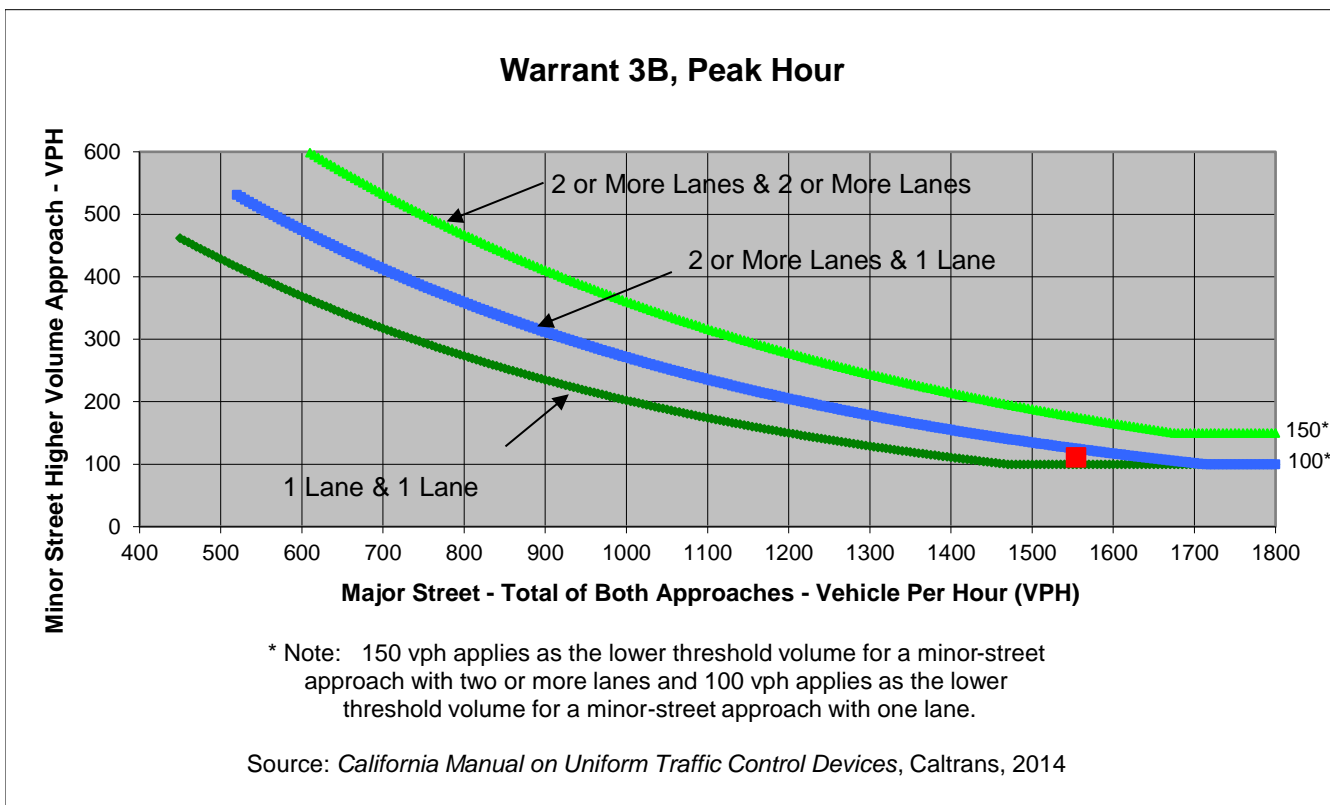
Project University of Nations Kona  
 Scenario Year 2050 + Project  
 Peak Hour PM Peak Periods

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	73	0	25
Through	553	898	0	0
Right	30	0	0	86
Total	583	971	0	111

Major Street Direction

x	North/South
	East/West



	Major Street	Minor Street	Warrant Met
	Kuakini Hwy	UofN Campus North Entrance	
<b>Number of Approach Lanes</b>	<b>2</b>	<b>1</b>	<b><u>NO</u></b>
<b>Traffic Volume (VPH) *</b>	<b>1,554</b>	<b>111</b>	

\* Note: Traffic Volume for Major Street is Total Volume of Both Approches.  
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



## Eight-Hour Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>	56% <sup>d</sup>	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>	56% <sup>d</sup>
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

<sup>a</sup> Basic minimum hourly volume

<sup>b</sup> Used for combination of Conditions A and B after adequate trial of other remedial measures

<sup>c</sup> May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

<sup>d</sup> May be used for combination of Conditions A and B after adequate trial of other remedial measures when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Intersection: 2. Kuakini Hwy & North Campus Entrance (Year 2050+Project Conditions)			
Time Period	Major Street	Minor Street	Met Criteria?
6:00 AM -7:00 AM	2723	15	No
7:00 AM -8:00 AM	2476	11	No
8:00 AM -9:00 AM	2599	13	No
9:00 AM -10:00 AM	2599	13	No
2:00 PM - 3:00 PM	2511	20	No
3:00 PM - 4:00 PM	2341	21	No
4:00 PM - 5:00 PM	2045	15	No
5:00 PM - 6:00 PM	2299	19	No

Intersection: 7. Queen Ka'ahumanu Hwy & Kuakini Hwy (Year 2050+Project Conditions)			
Time Period	Major Street	Minor Street	Met Criteria?
6:00 AM -7:00 AM	1148	18	No
7:00 AM -8:00 AM	1113	18	No
8:00 AM -9:00 AM	1130	18	No
9:00 AM -10:00 AM	1130	18	No
2:00 PM - 3:00 PM	1578	25	No
3:00 PM - 4:00 PM	1714	25	No
4:00 PM - 5:00 PM	1528	25	No
5:00 PM - 6:00 PM	1606	25	No

**APPENDIX D: LOS WORKSHEETS (PLUS MITIGATION)**



HCM 6th TWSC  
2: Kuakini Hwy & North Entrance

06/19/2023

Intersection						
Int Delay, s/veh	1.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↖		↙	↗
Traffic Vol, veh/h	13	55	586	67	99	326
Future Vol, veh/h	13	55	586	67	99	326
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	100	-	-	120	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	3	2	2	2
Mvmt Flow	15	65	698	80	118	388

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1362	740	0	0	778	0
Stage 1	738	-	-	-	-	-
Stage 2	624	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	163	417	-	-	839	-
Stage 1	473	-	-	-	-	-
Stage 2	534	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	140	416	-	-	839	-
Mov Cap-2 Maneuver	277	-	-	-	-	-
Stage 1	473	-	-	-	-	-
Stage 2	459	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16	0	2.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	277	416	839
HCM Lane V/C Ratio	-	-	0.056	0.157	0.14
HCM Control Delay (s)	-	-	18.8	15.3	10
HCM Lane LOS	-	-	C	C	A
HCM 95th %tile Q(veh)	-	-	0.2	0.6	0.5

HCM 6th TWSC  
2: Kuakini Hwy & North Entrance

06/19/2023

Intersection						
Int Delay, s/veh	1.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	24	83	490	26	64	782
Future Vol, veh/h	24	83	490	26	64	782
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	100	-	-	120	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	88	521	28	68	832

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1505	537	0	0	551
Stage 1	537	-	-	-	-
Stage 2	968	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	133	544	-	-	1019
Stage 1	586	-	-	-	-
Stage 2	368	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	124	543	-	-	1017
Mov Cap-2 Maneuver	249	-	-	-	-
Stage 1	585	-	-	-	-
Stage 2	343	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.7	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	249	543	1017	-
HCM Lane V/C Ratio	-	-	0.103	0.163	0.067	-
HCM Control Delay (s)	-	-	21.1	12.9	8.8	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0.6	0.2	-

HCM 6th TWSC  
2: Kuakini Hwy & North Entrance

06/19/2023

Intersection						
Int Delay, s/veh	1.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↖		↙	↗
Traffic Vol, veh/h	15	59	630	67	100	344
Future Vol, veh/h	15	59	630	67	100	344
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	100	-	-	120	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	3	2	2	2
Mvmt Flow	18	70	750	80	119	410

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1438	792	0	0	830
Stage 1	790	-	-	-	-
Stage 2	648	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	147	389	-	-	802
Stage 1	447	-	-	-	-
Stage 2	521	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	125	388	-	-	802
Mov Cap-2 Maneuver	260	-	-	-	-
Stage 1	447	-	-	-	-
Stage 2	444	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17	0	2.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	260	388	802	-
HCM Lane V/C Ratio	-	-	0.069	0.181	0.148	-
HCM Control Delay (s)	-	-	19.9	16.3	10.3	-
HCM Lane LOS	-	-	C	C	B	-
HCM 95th %tile Q(veh)	-	-	0.2	0.7	0.5	-

HCM 6th TWSC  
2: Kuakini Hwy & North Entrance

06/19/2023

Intersection						
Int Delay, s/veh	1.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↖		↖	↗
Traffic Vol, veh/h	24	84	520	28	68	839
Future Vol, veh/h	24	84	520	28	68	839
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	100	-	-	120	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	89	553	30	72	893

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1607	570	0	0	585	0
Stage 1	570	-	-	-	-	-
Stage 2	1037	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	116	521	-	-	990	-
Stage 1	566	-	-	-	-	-
Stage 2	342	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	107	520	-	-	988	-
Mov Cap-2 Maneuver	229	-	-	-	-	-
Stage 1	565	-	-	-	-	-
Stage 2	317	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.5	0	0.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	229	520	988	-
HCM Lane V/C Ratio	-	-	0.111	0.172	0.073	-
HCM Control Delay (s)	-	-	22.7	13.4	8.9	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0.6	0.2	-

HCM 6th TWSC  
2: Kuakini Hwy & North Entrance

06/19/2023

Intersection						
Int Delay, s/veh	2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶	↷	↶		↶	↷
Traffic Vol, veh/h	18	63	678	68	102	368
Future Vol, veh/h	18	63	678	68	102	368
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	100	-	-	120	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	3	2	2	2
Mvmt Flow	21	75	807	81	121	438

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1528	850	0	0	888
Stage 1	848	-	-	-	-
Stage 2	680	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	129	360	-	-	763
Stage 1	420	-	-	-	-
Stage 2	503	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	108	359	-	-	763
Mov Cap-2 Maneuver	242	-	-	-	-
Stage 1	420	-	-	-	-
Stage 2	423	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.5	0	2.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	242	359	763
HCM Lane V/C Ratio	-	-	0.089	0.209	0.159
HCM Control Delay (s)	-	-	21.3	17.7	10.6
HCM Lane LOS	-	-	C	C	B
HCM 95th %tile Q(veh)	-	-	0.3	0.8	0.6

HCM 6th TWSC  
2: Kuakini Hwy & North Entrance

06/19/2023

Intersection						
Int Delay, s/veh	1.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↖		↘	↗
Traffic Vol, veh/h	25	86	553	30	73	898
Future Vol, veh/h	25	86	553	30	73	898
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	100	-	-	120	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	91	588	32	78	955

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1717	606	0	0	622	0
Stage 1	606	-	-	-	-	-
Stage 2	1111	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	99	497	-	-	959	-
Stage 1	545	-	-	-	-	-
Stage 2	315	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	91	496	-	-	957	-
Mov Cap-2 Maneuver	209	-	-	-	-	-
Stage 1	544	-	-	-	-	-
Stage 2	289	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.3	0	0.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	209	496	957	-
HCM Lane V/C Ratio	-	-	0.127	0.184	0.081	-
HCM Control Delay (s)	-	-	24.7	13.9	9.1	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0.7	0.3	-



