

MEMORANDUM

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DATE: December 15, 2015

TO: Hilary Orr, City of Alexandria

CC: Maha Gilini, MSCE, CPM

FROM: Suresh Karre, P.E., PTOE
Jacquelyn Lassiter, P.E., PTOE

SUBJECT: King Street Road Diet Traffic Analysis

Introduction

VA-7 (King Street) is currently a four-lane, undivided arterial roadway between its intersections with Braddock Road to the northwest and Janneys Lane to the southeast. The City of Alexandria has proposed a road diet for this 1.5-mile portion of King Street; under the road diet, one through travel lane would be removed in either direction, with left-turn bays provided at all intersections along the corridor. In addition, bike lanes would be installed along the curb lane in both directions as part of the City's Complete Streets initiative.

This memorandum has been prepared to summarize the traffic analysis of a road diet with the addition of bicycle facilities along King Street between Janneys Lane and Braddock Road.

Data Collection

Intersection turning movement counts collected in June 2014 were provided to STV by the City of Alexandria in November 2015. Synchro files depicting both the Existing and Build conditions were also provided at this time. Tube counts along King Street were collected and provided to STV by the City in December 2015. These were then compared to the June 2014 count data, and through volumes along King Street were updated and balanced to reflect any differences in volume. Turning volumes were kept the same at all intersections along the corridor.

Traffic Analysis

To compare the impacts of the proposed road diet on traffic operations along King Street, each scenario was modeled in Synchro 9.0. Note that, in addition to Existing and Build conditions, a Build with Improvements was also considered. This additional scenario aims to mitigate the impacts of losing a travel lane in either direction along King Street by increasing the cycle length at the intersections of King Street at Kenwood Avenue and at Chinquapin Drive to 120 seconds. All pedestrian and clearance times were checked and kept consistent with those in the field.

Multiple Measures of Effectiveness (MOE) were considered; the first of these MOE were the overall Level of Service (LOS) and delay at each intersection along the corridor. A summary of the Synchro outputs for overall intersection LOS and delay is shown in **Table 1**. All intersection LOS and delay outputs are included as part of **Attachment A**.

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Table 1: Synchro Intersection LOS and Delay

Intersection	Existing				Build				Build with Improvements			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
King Street at Braddock Road	24.3	C	29.9	C	24.3	C	29.9	C	24.3	C	-	-
King Street at Kenwood Avenue	11.3	B	14.2	B	16.3	B	17.8	B	20.5	C	-	-
King Street at Chinquapin Drive	20.4	C	8.1	A	72.7	E	14.4	B	30.8	C	-	-
King Street at Janney's Lane	19.0	B	11.1	B	21.2	C	13.0	B	21.2	C	-	-
King Street at Highland	6.6	A	6.8	A	6.6	A	6.8	A	6.6	A	-	-

As shown in **Table 1**, impacts to intersection operations due to the road diet are minimal; however, delays at the intersection of King Street at Chinquapin Drive do increase significantly in the AM peak hour: from 20.4 seconds (LOS C) under Existing conditions to 72.7 seconds (LOS E) under Build conditions. With the proposed signal timing changes implemented under Build with Improvements conditions, this delay is reduced to 30.8 seconds (LOS C), which is acceptable.

Arterial LOS was also considered to measure the corridor-wide impacts of the proposed road diet. Summaries of the Synchro outputs for this MOE for both the AM and PM peak hours are shown in **Tables 2 and 3**, respectively. All arterial LOS outputs are included as part of **Attachment B**.

Table 2: Synchro Arterial LOS and Delay - AM Peak Hour

Signal	Existing AM				Build AM				Build with Improvements AM			
	Signal Delay (s)	Travel Time (s)	Distance (mi)	Arterial LOS	Signal Delay (s)	Travel Time (s)	Distance (mi)	Arterial LOS	Signal Delay (s)	Travel Time (s)	Distance (mi)	Arterial LOS
Eastbound King Street												
Kenwood Avenue	6.8	30.1	0.17	B	9.6	32.9	0.17	C	10.5	33.8	0.17	C
Chinquapin Drive	36.1	53.9	0.13	E	163.1	180.9	0.13	F	59.0	76.8	0.13	F
Janney's Lane	19.7	156.3	0.95	B	23.5	160.1	0.95	B	23.5	160.1	0.95	B
Highland	4.0	34.8	0.19	B	4.0	34.8	0.19	B	4.0	34.8	0.19	B
Overall	66.6	275.1	1.44	C	200.2	408.7	1.44	D	97.0	305.5	1.44	C
Westbound King Street												
Janney's Lane	13.3	44.1	0.19	D	13.3	44.1	0.19	D	13.3	44.1	0.19	D
Chinquapin Drive	3.5	101.1	0.95	A	6.4	104.0	0.95	A	6.6	104.2	0.95	A
Kenwood Avenue	8.2	24.4	0.13	C	22.0	38.2	0.13	E	18.6	34.8	0.13	E
Braddock Road	76.2	97.5	0.17	F	76.2	97.5	0.17	F	76.2	97.5	0.17	F
Overall	101.2	267.1	1.44	C	117.9	283.8	1.44	C	114.7	280.6	1.44	C

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Table 3: Synchro Arterial LOS and Delay - PM Peak Hour

Signal	Existing PM				Build PM			
	Signal Delay (s)	Travel Time (s)	Distance (mi)	Arterial LOS	Signal Delay (s)	Travel Time (s)	Distance (mi)	Arterial LOS
Eastbound King Street								
Kenwood Avenue	12.0	35.3	0.17	C	15.2	38.5	0.17	C
Chinquapin Drive	5.5	23.3	0.13	B	19.5	37.3	0.13	D
Janney's Lane	12.4	149.0	0.95	B	15.0	151.6	0.95	B
Highland	4.0	34.8	0.19	B	4.0	34.8	0.19	B
Overall	33.9	242.4	1.44	B	53.7	262.2	1.44	B
Westbound King Street								
Janney's Lane	5.3	36.1	0.19	C	5.3	36.1	0.19	C
Chinquapin Drive	3.1	100.7	0.95	A	4.5	102.1	0.95	A
Kenwood Avenue	9.6	25.8	0.13	D	19.0	35.2	0.13	E
Braddock Road	74.3	95.6	0.17	F	74.3	95.6	0.17	F
Overall	92.3	258.2	1.44	C	103.1	269.0	1.44	C

As shown in **Tables 2 and 3**, impacts to corridor operations along King Street are relatively minimal with the exception of the portion between Kenwood Avenue and Chinquapin Drive. This section of the corridor experiences a significant decrease in operations in the AM peak hour eastbound, from LOS E to LOS F.

With the proposed signal timing changes implemented under Build with Improvements conditions, the AM peak hour eastbound section continues to operate at LOS F; however, the signal delay and travel time approaching Chinquapin Lane are significantly reduced when compared to those under Build conditions: from 163.1 seconds to 59.0 seconds and from 180.9 seconds to 76.8 seconds, respectively. These results are significantly more in line with those seen under Existing conditions, and therefore may be considered acceptable. In addition, potentially reassigning 3-4 seconds of green time from the northbound left-turn movement to the King Street through movements is expected to maintain an overall intersection LOS C while reducing the AM peak hour eastbound arterial LOS from LOS F to LOS E, which is acceptable.

Conclusions

Based on the analysis provided, the impacts to traffic operations along King Street are relatively minimal with the exception of those at the intersection of King Street at Chinquapin Drive. With the proposed signal timing changes (increasing the cycle length at the intersections of King Street at Kenwood Avenue and at Chinquapin Drive to 120 seconds) implemented, the intersection LOS and delay are reduced to acceptable levels. While the AM peak hour eastbound section continues to operate at LOS F, the signal delay and travel time approaching Chinquapin Lane are significantly

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reduced when compared to those under Build conditions: from 163.1 seconds to 59.0 seconds and from 180.9 seconds to 76.8 seconds, respectively. These results are significantly more in line with those seen under Existing conditions, and therefore may be considered acceptable. In addition, potentially reassigning 3-4 seconds of green time from the northbound left-turn movement to the King Street through movements is expected to maintain an overall intersection LOS C while reducing the AM peak hour eastbound arterial LOS from LOS F to LOS E, which is acceptable.

To improve operations in the future, consideration may be given to the installation of a pedestrian refuge in the median of King Street at its intersection with Chinguapin Drive. The resulting two-stage pedestrian crossing may allow the northbound left-turn movement to start earlier, therefore reducing the overall intersection delay.

Appendix A

Synchro Intersection LOS and Delay Outputs

Existing Conditions
AM Peak Hour

HCM Signalized Intersection Capacity Analysis

21: CHINQUAPIN DR. & KING ST

12/14/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↔	
Traffic Volume (vph)	602	119	136	864	108	54
Future Volume (vph)	602	119	136	864	108	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	12	11	12	16	12
Grade (%)	-2%			3%	-3%	
Total Lost time (s)	9.0			1.0	5.5	
Lane Util. Factor	0.95			0.95	1.00	
Frbp, ped/bikes	0.99			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.98			1.00	0.95	
Flt Protected	1.00			0.99	0.97	
Satd. Flow (prot)	3349			3270	1924	
Flt Permitted	1.00			0.73	0.97	
Satd. Flow (perm)	3349			2388	1924	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	602	119	136	864	108	54
RTOR Reduction (vph)	14	0	0	0	17	0
Lane Group Flow (vph)	707	0	0	1000	145	0
Confl. Peds. (#/hr)		12			2	
Heavy Vehicles (%)	2%	2%	8%	8%	5%	5%
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	3	
Permitted Phases			6			
Actuated Green, G (s)	40.0			89.5	14.0	
Effective Green, g (s)	37.0			94.5	14.0	
Actuated g/C Ratio	0.32			0.82	0.12	
Clearance Time (s)	6.0			6.0	5.5	
Vehicle Extension (s)	0.2			0.2	3.0	
Lane Grp Cap (vph)	1077			2341	234	
v/s Ratio Prot	c0.21			c0.18	c0.08	
v/s Ratio Perm				0.17		
v/c Ratio	0.66			0.43	0.62	
Uniform Delay, d1	33.5			2.8	48.0	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	3.1			0.6	5.0	
Delay (s)	36.7			3.4	53.0	
Level of Service	D			A	D	
Approach Delay (s)	36.7			3.4	53.0	
Approach LOS	D			A	D	

Intersection Summary













HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

24: KING ST & BRADDOCK RD






















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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑	↗		↑↑	↗		↑↑		↗	↑↑		
Traffic Volume (vph)	0	464	432	0	480	260	0	540	4	232	436	0	
Future Volume (vph)	0	464	432	0	480	260	0	540	4	232	436	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	12	12	12	11	11	11	12	11	12	11	11	12	
Total Lost time (s)		1.0	1.0		1.0	1.0		1.0		1.0	1.0		
Lane Util. Factor		1.00	1.00		0.95	1.00		0.95		1.00	0.95		
Frb, ped/bikes		1.00	0.99		1.00	1.00		1.00		1.00	1.00		
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00		1.00	1.00		
Frt		1.00	0.85		1.00	0.85		1.00		1.00	1.00		
Flt Protected		1.00	1.00		1.00	1.00		1.00		0.95	1.00		
Satd. Flow (prot)		1881	1578		3421	1531		3800		1728	4000		
Flt Permitted		1.00	1.00		1.00	1.00		1.00		0.95	1.00		
Satd. Flow (perm)		1881	1578		3421	1531		3451		1728	3455		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	0	464	432	0	480	260	0	540	4	232	436	0	
RTOR Reduction (vph)	0	0	99	0	0	104	0	0	0	0	0	0	
Lane Group Flow (vph)	0	464	333	0	480	156	0	544	0	232	436	0	
Confl. Peds. (#/hr)			2	2			2		2	1		2	
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%	
Turn Type		NA	Perm		NA	Perm		NA		Prot	NA		
Protected Phases		1 2 7 8			1 2 7 8			3		4	3 4		
Permitted Phases		6	1 2 7 8		6	1 2 7 8							
Actuated Green, G (s)		96.0	96.0		96.0	96.0		25.0		29.0	60.0		
Effective Green, g (s)		101.0	101.0		101.0	101.0		30.0		34.0	65.0		
Actuated g/C Ratio		0.60	0.60		0.60	0.60		0.18		0.20	0.39		
Clearance Time (s)								6.0		6.0			
Vehicle Extension (s)								4.0		2.0			
Lane Grp Cap (vph)		1130	948		2056	920		678		349	1547		
v/s Ratio Prot		c0.25			0.14			c0.14		c0.13	0.11		
v/s Ratio Perm			0.21			0.10							
v/c Ratio		0.41	0.35		0.23	0.17		0.80		0.66	0.28		
Uniform Delay, d1		17.7	16.9		15.5	14.9		66.2		61.7	35.4		
Progression Factor		0.21	0.59		1.00	1.00		1.00		0.47	0.11		
Incremental Delay, d2		0.1	0.1		0.1	0.1		9.7		7.8	0.4		
Delay (s)		3.9	10.1		15.6	15.0		75.9		36.5	4.4		
Level of Service		A	B		B	B		E		D	A		
Approach Delay (s)		6.9			15.4			75.9			15.6		
Approach LOS		A			B			E			B		
Intersection Summary													
HCM 2000 Control Delay			24.3									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.54										
Actuated Cycle Length (s)			168.0									Sum of lost time (s)	10.0
Intersection Capacity Utilization			62.3%									ICU Level of Service	B
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

258: KENWOOD AV & KING ST

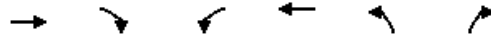
12/14/2015

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			 						 		
Traffic Volume (vph)	14	544	210	83	546	343	53	100	25	152	100	18	
Future Volume (vph)	14	544	210	83	546	343	53	100	25	152	100	18	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	12	12	11	12	12	12	16	16	16	12	12	16	
Grade (%)		0%			0%			0%			-5%		
Total Lost time (s)		1.0	6.0		1.0			6.0			6.0	6.0	
Lane Util. Factor		*0.95	1.00		0.95			1.00			1.00	1.00	
Frb, ped/bikes		1.00	0.94		0.98			1.00			1.00	0.99	
Flpb, ped/bikes		1.00	1.00		1.00			1.00			1.00	1.00	
Frt		1.00	0.85		0.95			0.98			1.00	0.85	
Flt Protected		1.00	1.00		1.00			0.99			0.97	1.00	
Satd. Flow (prot)		3605	1467		3131			1995			1846	1814	
Flt Permitted		0.93	1.00		0.86			0.80			0.73	1.00	
Satd. Flow (perm)		3349	1467		2701			1615			1380	1814	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	14	544	210	83	546	343	53	100	25	152	100	18	
RTOR Reduction (vph)	0	0	91	0	56	0	0	8	0	0	0	13	
Lane Group Flow (vph)	0	558	119	0	916	0	0	170	0	0	252	5	
Confl. Peds. (#/hr)	17		30	30		17	2		9	9		2	
Heavy Vehicles (%)	0%	0%	0%	5%	5%	5%	4%	4%	4%	2%	2%	2%	
Bus Blockages (#/hr)	0	0	0	0	9	0	0	0	0	0	0	0	
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm	
Protected Phases		6			2			8			4		
Permitted Phases	6		6	2			8		4			4	
Actuated Green, G (s)		40.2	40.2		40.2			18.9			18.9	18.9	
Effective Green, g (s)		45.2	40.2		45.2			18.9			18.9	18.9	
Actuated g/C Ratio		0.64	0.57		0.64			0.27			0.27	0.27	
Clearance Time (s)		6.0	6.0		6.0			6.0			6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0			4.0			4.0	4.0	
Lane Grp Cap (vph)		2129	829		1717			429			366	482	
v/s Ratio Prot													
v/s Ratio Perm		0.17	0.08		c0.34			0.11			c0.18	0.00	
v/c Ratio		0.26	0.14		0.53			0.40			0.69	0.01	
Uniform Delay, d1		5.7	7.3		7.1			21.4			23.5	19.2	
Progression Factor		1.00	1.00		1.00			1.00			1.00	1.00	
Incremental Delay, d2		0.3	0.4		1.2			0.8			5.8	0.0	
Delay (s)		6.0	7.7		8.3			22.2			29.2	19.2	
Level of Service		A	A		A			C			C	B	
Approach Delay (s)		6.4			8.3			22.2			28.6		
Approach LOS		A			A			C			C		
Intersection Summary													
HCM 2000 Control Delay			11.3									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.57										
Actuated Cycle Length (s)			71.1									Sum of lost time (s)	7.0
Intersection Capacity Utilization			88.4%									ICU Level of Service	E
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

260: Highland & KING ST

12/14/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	588	8	4	556	44	16
Future Volume (vph)	588	8	4	556	44	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	15	11	12	16	11	12
Grade (%)	0%			1%	-2%	
Total Lost time (s)	0.0			8.0	4.5	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	0.99	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.96	
Flt Protected	1.00			1.00	0.96	
Satd. Flow (prot)	1893			1919	1712	
Flt Permitted	1.00			1.00	0.96	
Satd. Flow (perm)	1893			1914	1712	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	588	8	4	556	44	16
RTOR Reduction (vph)	1	0	0	0	13	0
Lane Group Flow (vph)	595	0	0	560	47	0
Confl. Peds. (#/hr)		10	10		1	3
Heavy Vehicles (%)	4%	4%	4%	4%	0%	0%
Bus Blockages (#/hr)	14	0	0	17	0	0
Turn Type	NA		Perm	NA	Prot	
Protected Phases	1			1	2	
Permitted Phases			1			
Actuated Green, G (s)	45.0			45.0	12.0	
Effective Green, g (s)	50.0			42.0	12.0	
Actuated g/C Ratio	0.75			0.63	0.18	
Clearance Time (s)	5.0			5.0	4.5	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	1423			1208	308	
v/s Ratio Prot	c0.31				c0.03	
v/s Ratio Perm				0.29		
v/c Ratio	0.42			0.46	0.15	
Uniform Delay, d1	3.0			6.4	23.0	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.9			1.3	1.0	
Delay (s)	3.9			7.7	24.0	
Level of Service	A			A	C	
Approach Delay (s)	3.9			7.7	24.0	
Approach LOS	A			A	C	

Intersection Summary

HCM 2000 Control Delay	6.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	66.5	Sum of lost time (s)	12.5
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

262: JANNEY'S LN & KING ST

12/14/2015

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↘	↑	↘	↗
Traffic Volume (vph)	463	193	102	546	454	148
Future Volume (vph)	463	193	102	546	454	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	15	15
Grade (%)	-2%			-2%	0%	
Total Lost time (s)	0.5	0.5	5.0	5.5	0.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.97	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	2000	1503	1677	1767	1928	1676
Flt Permitted	1.00	1.00	0.27	1.00	0.95	1.00
Satd. Flow (perm)	1819	1503	485	1767	1928	1676
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	463	193	102	546	454	148
RTOR Reduction (vph)	0	104	0	0	0	0
Lane Group Flow (vph)	463	89	102	546	454	148
Confl. Peds. (#/hr)		7	7			
Heavy Vehicles (%)	2%	2%	5%	5%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	7
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	2 1	3	
Permitted Phases		2	2 1			3
Actuated Green, G (s)	35.1	35.1	46.6	51.6	24.8	24.8
Effective Green, g (s)	40.1	40.1	46.6	46.6	29.8	24.8
Actuated g/C Ratio	0.46	0.46	0.54	0.54	0.34	0.29
Clearance Time (s)	5.5	5.5	5.0		5.0	5.0
Vehicle Extension (s)	4.0	4.0	0.2		4.0	4.0
Lane Grp Cap (vph)	922	693	417	947	661	478
v/s Ratio Prot	0.23		0.03	c0.31	c0.24	
v/s Ratio Perm		0.06	0.10			0.09
v/c Ratio	0.50	0.13	0.24	0.58	0.69	0.31
Uniform Delay, d1	16.4	13.4	11.6	13.5	24.5	24.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	0.4	0.1	0.5	3.2	0.5
Delay (s)	18.4	13.8	11.7	14.1	27.8	24.8
Level of Service	B	B	B	B	C	C
Approach Delay (s)	17.0			13.7	27.0	
Approach LOS	B			B	C	
Intersection Summary						
HCM 2000 Control Delay			19.0		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.60			
Actuated Cycle Length (s)			86.9		Sum of lost time (s)	10.5
Intersection Capacity Utilization			67.0%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

PM Peak Hour

HCM Signalized Intersection Capacity Analysis

21: CHINQUAPIN DR. & KING ST

12/14/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↔	
Traffic Volume (vph)	607	116	72	655	132	56
Future Volume (vph)	607	116	72	655	132	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	12	11	12	16	12
Grade (%)	-2%			3%	-3%	
Total Lost time (s)	9.0			1.0	5.5	
Lane Util. Factor	0.95			0.95	1.00	
Frbp, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.98			1.00	0.96	
Flt Protected	1.00			1.00	0.97	
Satd. Flow (prot)	3357			3276	1930	
Flt Permitted	1.00			0.83	0.97	
Satd. Flow (perm)	3357			2718	1930	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	607	116	72	655	132	56
RTOR Reduction (vph)	6	0	0	0	14	0
Lane Group Flow (vph)	717	0	0	727	174	0
Confl. Peds. (#/hr)		12			2	
Heavy Vehicles (%)	2%	2%	8%	8%	5%	5%
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	3	
Permitted Phases			6			
Actuated Green, G (s)	57.1			57.1	10.0	
Effective Green, g (s)	54.1			62.1	10.0	
Actuated g/C Ratio	0.69			0.79	0.13	
Clearance Time (s)	6.0			6.0	5.5	
Vehicle Extension (s)	0.2			0.2	0.2	
Lane Grp Cap (vph)	2310			2147	245	
v/s Ratio Prot	0.21				c0.09	
v/s Ratio Perm				c0.27		
v/c Ratio	0.31			0.34	0.71	
Uniform Delay, d1	4.9			2.4	32.9	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.4			0.1	7.8	
Delay (s)	5.2			2.5	40.7	
Level of Service	A			A	D	
Approach Delay (s)	5.2			2.5	40.7	
Approach LOS	A			A	D	

Intersection Summary













HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	78.6	Sum of lost time (s)	22.5
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

24: KING ST & BRADDOCK RD






















12/14/2015

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑	↗		↑↑	↗		↑↑		↗	↑↑		
Traffic Volume (vph)	0	400	144	0	560	324	0	547	4	244	494	0	
Future Volume (vph)	0	400	144	0	560	324	0	547	4	244	494	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	12	12	12	11	11	11	12	11	12	11	11	12	
Total Lost time (s)		1.0	1.0		6.0	6.0		1.0		6.0	1.0		
Lane Util. Factor		1.00	1.00		0.95	1.00		0.95		1.00	0.95		
Frb, ped/bikes		1.00	0.99		1.00	1.00		1.00		1.00	1.00		
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00		1.00	1.00		
Frt		1.00	0.85		1.00	0.85		1.00		1.00	1.00		
Flt Protected		1.00	1.00		1.00	1.00		1.00		0.95	1.00		
Satd. Flow (prot)		1881	1578		3421	1531		3800		1728	4000		
Flt Permitted		1.00	1.00		1.00	1.00		1.00		0.95	1.00		
Satd. Flow (perm)		1881	1578		3421	1531		3451		1728	3455		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	0	400	144	0	560	324	0	547	4	244	494	0	
RTOR Reduction (vph)	0	0	54	0	0	132	0	0	0	0	0	0	
Lane Group Flow (vph)	0	400	90	0	560	192	0	551	0	244	494	0	
Confl. Peds. (#/hr)			2	2			2		2			2	
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%	
Turn Type		NA	Perm		NA	Perm		NA		Prot	NA		
Protected Phases		1 2 7 8			1 2 7 8			3		4	3 4		
Permitted Phases		6	1 2 7 8		6	1 2 7 8							
Actuated Green, G (s)		98.0	98.0		98.0	98.0		25.0		24.0	55.0		
Effective Green, g (s)		103.0	103.0		98.0	98.0		30.0		24.0	60.0		
Actuated g/C Ratio		0.62	0.62		0.59	0.59		0.18		0.15	0.36		
Clearance Time (s)								6.0		6.0			
Vehicle Extension (s)								4.0		2.0			
Lane Grp Cap (vph)		1174	985		2031	909		690		251	1454		
v/s Ratio Prot		c0.21			0.16			c0.14		c0.14	0.12		
v/s Ratio Perm			0.06			0.13							
v/c Ratio		0.34	0.09		0.28	0.21		0.80		0.97	0.34		
Uniform Delay, d1		14.8	12.4		16.3	15.6		64.6		70.2	38.1		
Progression Factor		0.32	0.12		1.00	1.00		1.00		0.52	0.27		
Incremental Delay, d2		0.2	0.0		0.1	0.1		9.4		40.1	0.4		
Delay (s)		4.9	1.6		16.3	15.7		74.0		76.8	10.7		
Level of Service		A	A		B	B		E		E	B		
Approach Delay (s)		4.0			16.1			74.0			32.6		
Approach LOS		A			B			E			C		
Intersection Summary													
HCM 2000 Control Delay			29.9									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.60										
Actuated Cycle Length (s)			165.0									Sum of lost time (s)	31.0
Intersection Capacity Utilization			67.1%									ICU Level of Service	C
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

258: KENWOOD AV & KING ST

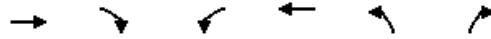
12/14/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (vph)	20	439	100	40	523	224	40	32	20	264	52	28
Future Volume (vph)	20	439	100	40	523	224	40	32	20	264	52	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	12	12	12	16	16	16	12	12	16
Grade (%)		0%			0%			0%			-5%	
Total Lost time (s)		6.0	6.0		1.0			6.0			6.0	6.0
Lane Util. Factor		0.95	1.00		0.95			1.00			1.00	1.00
Frb, ped/bikes		1.00	0.97		0.99			0.99			1.00	0.98
Flpb, ped/bikes		1.00	1.00		1.00			1.00			0.98	1.00
Frt		1.00	0.85		0.96			0.97			1.00	0.85
Flt Protected		1.00	1.00		1.00			0.98			0.96	1.00
Satd. Flow (prot)		3497	1474		3290			1988			1802	1809
Flt Permitted		0.91	1.00		0.91			0.78			0.70	1.00
Satd. Flow (perm)		3179	1474		3017			1578			1311	1809
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	439	100	40	523	224	40	32	20	264	52	28
RTOR Reduction (vph)	0	0	47	0	37	0	0	13	0	0	0	19
Lane Group Flow (vph)	0	459	53	0	750	0	0	79	0	0	316	9
Confl. Peds. (#/hr)	7		5	5		7	4		21	21		4
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	9	0	0	0	0	0	0	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		6			2			8			4	
Permitted Phases	6		6	2			8			4		4
Actuated Green, G (s)		40.4	40.4		40.4			24.4			24.4	24.4
Effective Green, g (s)		40.4	40.4		45.4			24.4			24.4	24.4
Actuated g/C Ratio		0.53	0.53		0.59			0.32			0.32	0.32
Clearance Time (s)		6.0	6.0		6.0			6.0			6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0			4.0			4.0	4.0
Lane Grp Cap (vph)		1672	775		1783			501			416	574
v/s Ratio Prot												
v/s Ratio Perm		0.14	0.04		c0.25			0.05			c0.24	0.00
v/c Ratio		0.27	0.07		0.42			0.16			0.76	0.02
Uniform Delay, d1		10.1	8.9		8.5			18.8			23.6	18.0
Progression Factor		1.00	1.00		1.00			1.00			1.00	1.00
Incremental Delay, d2		0.4	0.2		0.7			0.2			8.3	0.0
Delay (s)		10.5	9.1		9.3			19.0			31.8	18.0
Level of Service		B	A		A			B			C	B
Approach Delay (s)		10.2			9.3			19.0			30.7	
Approach LOS		B			A			B			C	
Intersection Summary												
HCM 2000 Control Delay			14.2									B
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			76.8								12.0	
Intersection Capacity Utilization			82.0%									E
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

260: Highland & KING ST

12/14/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	616	8	12	804	12	12
Future Volume (vph)	616	8	12	804	12	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	15	11	12	16	11	12
Grade (%)	0%			1%	-2%	
Total Lost time (s)	0.0			6.0	4.5	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.93	
Flt Protected	1.00			1.00	0.98	
Satd. Flow (prot)	1971			2015	1563	
Flt Permitted	1.00			0.99	0.98	
Satd. Flow (perm)	1971			1998	1563	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	616	8	12	804	12	12
RTOR Reduction (vph)	1	0	0	0	10	0
Lane Group Flow (vph)	623	0	0	816	14	0
Confl. Peds. (#/hr)		10	10		2	
Heavy Vehicles (%)	2%	2%	2%	2%	8%	8%
Bus Blockages (#/hr)	9	0	0	10	0	0
Turn Type	NA		Perm	NA	Prot	
Protected Phases	1			1	2	
Permitted Phases			1			
Actuated Green, G (s)	45.0			45.0	12.0	
Effective Green, g (s)	50.0			44.0	12.0	
Actuated g/C Ratio	0.75			0.66	0.18	
Clearance Time (s)	5.0			5.0	4.5	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	1481			1321	282	
v/s Ratio Prot	0.32				c0.01	
v/s Ratio Perm				c0.41		
v/c Ratio	0.42			0.62	0.05	
Uniform Delay, d1	3.0			6.4	22.5	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.9			2.2	0.3	
Delay (s)	3.9			8.6	22.9	
Level of Service	A			A	C	
Approach Delay (s)	3.9			8.6	22.9	
Approach LOS	A			A	C	

Intersection Summary

HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	66.5	Sum of lost time (s)	10.5
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

262: JANNEY'S LN & KING ST

12/14/2015

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↘	↑	↘	↗
Traffic Volume (vph)	399	264	226	557	170	144
Future Volume (vph)	399	264	226	557	170	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	15	15
Grade (%)	-2%			-2%	0%	
Total Lost time (s)	0.5	0.5	5.0	0.5	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.97	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	2000	1504	1726	1819	1928	1647
Flt Permitted	1.00	1.00	0.39	1.00	0.95	1.00
Satd. Flow (perm)	1819	1504	705	1819	1928	1647
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	399	264	226	557	170	144
RTOR Reduction (vph)	0	122	0	0	0	0
Lane Group Flow (vph)	399	142	226	557	170	144
Confl. Peds. (#/hr)		8	8			1
Heavy Vehicles (%)	2%	2%	2%	2%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	6
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	2 1	3	
Permitted Phases		2	2 1			3
Actuated Green, G (s)	35.2	35.2	45.4	50.4	13.6	13.6
Effective Green, g (s)	40.2	40.2	45.4	55.4	13.6	13.6
Actuated g/C Ratio	0.54	0.54	0.61	0.74	0.18	0.18
Clearance Time (s)	5.5	5.5	5.0		5.0	5.0
Vehicle Extension (s)	4.0	4.0	0.2		4.0	4.0
Lane Grp Cap (vph)	1079	811	569	1352	351	300
v/s Ratio Prot	0.20		0.05	c0.31	c0.09	
v/s Ratio Perm		0.09	0.19			0.09
v/c Ratio	0.37	0.18	0.40	0.41	0.48	0.48
Uniform Delay, d1	9.9	8.7	7.3	3.5	27.3	27.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.5	0.2	0.1	1.4	1.6
Delay (s)	10.8	9.2	7.5	3.6	28.7	28.9
Level of Service	B	A	A	A	C	C
Approach Delay (s)	10.2			4.7	28.8	
Approach LOS	B			A	C	

Intersection Summary

HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	74.5	Sum of lost time (s)	10.5
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Build Conditions
AM Peak Hour

HCM Signalized Intersection Capacity Analysis

21: CHINQUAPIN DR. & KING ST

12/14/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻		↻	↻	↻	
Traffic Volume (vph)	602	119	136	864	108	54
Future Volume (vph)	602	119	136	864	108	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	12	11	12	16	12
Grade (%)	-2%			3%	-3%	
Total Lost time (s)	9.0		5.0	1.0	5.5	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frbp, ped/bikes	0.99		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.98		1.00	1.00	0.95	
Flt Protected	1.00		0.95	1.00	0.97	
Satd. Flow (prot)	1767		1591	1733	1924	
Flt Permitted	1.00		0.09	1.00	0.97	
Satd. Flow (perm)	1767		149	1733	1924	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	602	119	136	864	108	54
RTOR Reduction (vph)	6	0	0	0	17	0
Lane Group Flow (vph)	715	0	136	864	145	0
Confl. Peds. (#/hr)		12			2	
Heavy Vehicles (%)	2%	2%	8%	8%	5%	5%
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	3	
Permitted Phases			6			
Actuated Green, G (s)	40.0		89.5	89.5	14.0	
Effective Green, g (s)	37.0		89.5	94.5	14.0	
Actuated g/C Ratio	0.32		0.78	0.82	0.12	
Clearance Time (s)	6.0		5.0	6.0	5.5	
Vehicle Extension (s)	0.2		0.2	0.2	3.0	
Lane Grp Cap (vph)	568		673	1424	234	
v/s Ratio Prot	c0.40		0.08	c0.50	c0.08	
v/s Ratio Perm			0.08			
v/c Ratio	1.26		0.20	0.61	0.62	
Uniform Delay, d1	39.0		11.0	3.6	48.0	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	130.2		0.7	1.9	5.0	
Delay (s)	169.2		11.7	5.6	53.0	
Level of Service	F		B	A	D	
Approach Delay (s)	169.2			6.4	53.0	
Approach LOS	F			A	D	

Intersection Summary













HCM 2000 Control Delay	72.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

24: KING ST & BRADDOCK RD





















12/14/2015

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		↑	↗		↑↑	↗		↑↑		↗	↑↑			
Traffic Volume (vph)	0	464	432	0	480	260	0	540	4	232	436	0		
Future Volume (vph)	0	464	432	0	480	260	0	540	4	232	436	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width	12	12	12	11	11	11	12	11	12	11	11	12		
Total Lost time (s)		1.0	1.0		1.0	1.0		1.0		1.0	1.0			
Lane Util. Factor		1.00	1.00		0.95	1.00		0.95		1.00	0.95			
Frb, ped/bikes		1.00	0.99		1.00	1.00		1.00		1.00	1.00			
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00		1.00	1.00			
Frt		1.00	0.85		1.00	0.85		1.00		1.00	1.00			
Flt Protected		1.00	1.00		1.00	1.00		1.00		0.95	1.00			
Satd. Flow (prot)		1881	1578		3421	1531		3800		1728	4000			
Flt Permitted		1.00	1.00		1.00	1.00		1.00		0.95	1.00			
Satd. Flow (perm)		1881	1578		3421	1531		3451		1728	3455			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Adj. Flow (vph)	0	464	432	0	480	260	0	540	4	232	436	0		
RTOR Reduction (vph)	0	0	99	0	0	104	0	0	0	0	0	0		
Lane Group Flow (vph)	0	464	333	0	480	156	0	544	0	232	436	0		
Confl. Peds. (#/hr)			2	2			2		2	1		2		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%		
Turn Type		NA	Perm		NA	Perm		NA		Prot	NA			
Protected Phases		1 2 7 8			1 2 7 8			3		4	3 4			
Permitted Phases		6	1 2 7 8		6	1 2 7 8								
Actuated Green, G (s)		96.0	96.0		96.0	96.0		25.0		29.0	60.0			
Effective Green, g (s)		101.0	101.0		101.0	101.0		30.0		34.0	65.0			
Actuated g/C Ratio		0.60	0.60		0.60	0.60		0.18		0.20	0.39			
Clearance Time (s)								6.0		6.0				
Vehicle Extension (s)								4.0		2.0				
Lane Grp Cap (vph)		1130	948		2056	920		678		349	1547			
v/s Ratio Prot		c0.25			0.14			c0.14		c0.13	0.11			
v/s Ratio Perm			0.21			0.10								
v/c Ratio		0.41	0.35		0.23	0.17		0.80		0.66	0.28			
Uniform Delay, d1		17.7	16.9		15.5	14.9		66.2		61.7	35.4			
Progression Factor		0.21	0.59		1.00	1.00		1.00		0.47	0.11			
Incremental Delay, d2		0.1	0.1		0.1	0.1		9.7		7.8	0.4			
Delay (s)		3.9	10.1		15.6	15.0		75.9		36.5	4.4			
Level of Service		A	B		B	B		E		D	A			
Approach Delay (s)		6.9			15.4			75.9			15.6			
Approach LOS		A			B			E			B			
Intersection Summary														
HCM 2000 Control Delay			24.3									HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio			0.54											
Actuated Cycle Length (s)			168.0								10.0			
Intersection Capacity Utilization			62.3%										ICU Level of Service	B
Analysis Period (min)			15											
c Critical Lane Group														

HCM Signalized Intersection Capacity Analysis

258: KENWOOD AV & KING ST

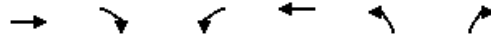
12/14/2015

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	14	544	210	83	546	343	53	100	25	152	100	18	
Future Volume (vph)	14	544	210	83	546	343	53	100	25	152	100	18	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	12	12	11	12	12	12	16	16	16	12	12	16	
Grade (%)		0%			0%			0%			-5%		
Total Lost time (s)	6.0	1.0	6.0	6.0	1.0			6.0			6.0	6.0	
Lane Util. Factor	1.00	*0.95	1.00	1.00	1.00			1.00			1.00	1.00	
Frb, ped/bikes	1.00	1.00	0.94	1.00	0.98			1.00			1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	0.98	1.00			1.00			0.99	1.00	
Frt	1.00	1.00	0.85	1.00	0.94			0.98			1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.99			0.97	1.00	
Satd. Flow (prot)	1798	1805	1467	1693	1616			1991			1841	1814	
Flt Permitted	0.13	1.00	1.00	0.33	1.00			0.80			0.73	1.00	
Satd. Flow (perm)	251	1805	1467	580	1616			1611			1377	1814	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	14	544	210	83	546	343	53	100	25	152	100	18	
RTOR Reduction (vph)	0	0	58	0	17	0	0	8	0	0	0	13	
Lane Group Flow (vph)	14	544	152	83	872	0	0	170	0	0	252	5	
Confl. Peds. (#/hr)	17		30	30		17	2		9	9		2	
Heavy Vehicles (%)	0%	0%	0%	5%	5%	5%	4%	4%	4%	2%	2%	2%	
Bus Blockages (#/hr)	0	0	0	0	9	0	0	0	0	0	0	0	
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm	
Protected Phases		6			2			8				4	
Permitted Phases	6		6	2			8			4		4	
Actuated Green, G (s)	40.2	40.2	40.2	40.2	40.2			18.9			18.9	18.9	
Effective Green, g (s)	40.2	45.2	40.2	40.2	45.2			18.9			18.9	18.9	
Actuated g/C Ratio	0.57	0.64	0.57	0.57	0.64			0.27			0.27	0.27	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0			6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			4.0			4.0	4.0	
Lane Grp Cap (vph)	141	1147	829	327	1027			428			366	482	
v/s Ratio Prot		0.30			c0.54								
v/s Ratio Perm	0.06		0.10	0.14				0.11			c0.18	0.00	
v/c Ratio	0.10	0.47	0.18	0.25	0.85			0.40			0.69	0.01	
Uniform Delay, d1	7.1	6.8	7.5	7.8	10.2			21.4			23.5	19.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00			1.00	1.00	
Incremental Delay, d2	1.4	1.4	0.5	1.9	8.7			0.8			5.8	0.0	
Delay (s)	8.5	8.2	8.0	9.7	19.0			22.3			29.2	19.2	
Level of Service	A	A	A	A	B			C			C	B	
Approach Delay (s)		8.1			18.2			22.3			28.6		
Approach LOS		A			B			C			C		
Intersection Summary													
HCM 2000 Control Delay			16.3									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.78										
Actuated Cycle Length (s)			71.1									Sum of lost time (s)	7.0
Intersection Capacity Utilization			93.8%									ICU Level of Service	F
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

260: Highland & KING ST

12/14/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	588	8	4	556	44	16
Future Volume (vph)	588	8	4	556	44	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	15	11	12	16	11	12
Grade (%)	0%			1%	-2%	
Total Lost time (s)	0.0			8.0	4.5	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	0.99	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.96	
Flt Protected	1.00			1.00	0.96	
Satd. Flow (prot)	1893			1919	1712	
Flt Permitted	1.00			1.00	0.96	
Satd. Flow (perm)	1893			1914	1712	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	588	8	4	556	44	16
RTOR Reduction (vph)	1	0	0	0	13	0
Lane Group Flow (vph)	595	0	0	560	47	0
Confl. Peds. (#/hr)		10	10		1	3
Heavy Vehicles (%)	4%	4%	4%	4%	0%	0%
Bus Blockages (#/hr)	14	0	0	17	0	0
Turn Type	NA		Perm	NA	Prot	
Protected Phases	1			1	2	
Permitted Phases			1			
Actuated Green, G (s)	45.0			45.0	12.0	
Effective Green, g (s)	50.0			42.0	12.0	
Actuated g/C Ratio	0.75			0.63	0.18	
Clearance Time (s)	5.0			5.0	4.5	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	1423			1208	308	
v/s Ratio Prot	c0.31				c0.03	
v/s Ratio Perm				0.29		
v/c Ratio	0.42			0.46	0.15	
Uniform Delay, d1	3.0			6.4	23.0	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.9			1.3	1.0	
Delay (s)	3.9			7.7	24.0	
Level of Service	A			A	C	
Approach Delay (s)	3.9			7.7	24.0	
Approach LOS	A			A	C	

Intersection Summary

HCM 2000 Control Delay	6.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	66.5	Sum of lost time (s)	12.5
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

262: JANNEY'S LN & KING ST

12/14/2015

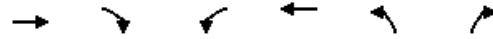
	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↘	↖	↘	↗
Traffic Volume (vph)	463	193	102	546	454	148
Future Volume (vph)	463	193	102	546	454	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	15	15
Grade (%)	-2%			-2%	0%	
Total Lost time (s)	0.5		5.0	5.5	0.0	5.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frpb, ped/bikes	0.99		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.96		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	2000		1678	1767	1928	1676
Flt Permitted	1.00		0.11	1.00	0.95	1.00
Satd. Flow (perm)	1732		201	1767	1928	1676
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	463	193	102	546	454	148
RTOR Reduction (vph)	16	0	0	0	0	0
Lane Group Flow (vph)	640	0	102	546	454	148
Confl. Peds. (#/hr)		7	7			
Heavy Vehicles (%)	2%	2%	5%	5%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	7
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	2		1	2 1	3	
Permitted Phases			2 1			3
Actuated Green, G (s)	35.1		46.6	51.6	24.8	24.8
Effective Green, g (s)	40.1		46.6	46.6	29.8	24.8
Actuated g/C Ratio	0.46		0.54	0.54	0.34	0.29
Clearance Time (s)	5.5		5.0		5.0	5.0
Vehicle Extension (s)	4.0		0.2		4.0	4.0
Lane Grp Cap (vph)	922		303	947	661	478
v/s Ratio Prot	c0.32		0.04	c0.31	c0.24	
v/s Ratio Perm			0.14			0.09
v/c Ratio	0.69		0.34	0.58	0.69	0.31
Uniform Delay, d1	18.5		14.5	13.5	24.5	24.3
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	4.3		0.2	0.5	3.2	0.5
Delay (s)	22.8		14.8	14.1	27.8	24.8
Level of Service	C		B	B	C	C
Approach Delay (s)	22.8			14.2	27.0	
Approach LOS	C			B	C	
Intersection Summary						
HCM 2000 Control Delay			21.2		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.68			
Actuated Cycle Length (s)			86.9		Sum of lost time (s)	10.5
Intersection Capacity Utilization			79.0%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

PM Peak Hour

HCM Signalized Intersection Capacity Analysis

21: CHINQUAPIN DR. & KING ST

12/14/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↔	↔	
Traffic Volume (vph)	607	116	72	655	132	56
Future Volume (vph)	607	116	72	655	132	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	12	11	12	16	12
Grade (%)	-2%			3%	-3%	
Total Lost time (s)	9.0		5.0	1.0	5.5	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frbp, ped/bikes	1.00		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.98		1.00	1.00	0.96	
Flt Protected	1.00		0.95	1.00	0.97	
Satd. Flow (prot)	1771		1591	1733	1930	
Flt Permitted	1.00		0.25	1.00	0.97	
Satd. Flow (perm)	1771		411	1733	1930	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	607	116	72	655	132	56
RTOR Reduction (vph)	4	0	0	0	14	0
Lane Group Flow (vph)	719	0	72	655	174	0
Confl. Peds. (#/hr)		12			2	
Heavy Vehicles (%)	2%	2%	8%	8%	5%	5%
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	3	
Permitted Phases			6			
Actuated Green, G (s)	47.5		58.0	58.0	10.0	
Effective Green, g (s)	44.5		58.0	63.0	10.0	
Actuated g/C Ratio	0.56		0.73	0.79	0.13	
Clearance Time (s)	6.0		5.0	6.0	5.5	
Vehicle Extension (s)	0.2		3.0	0.2	0.2	
Lane Grp Cap (vph)	991		381	1373	242	
v/s Ratio Prot	c0.41		0.01	c0.38	c0.09	
v/s Ratio Perm			0.12			
v/c Ratio	0.73		0.19	0.48	0.72	
Uniform Delay, d1	13.0		5.7	2.8	33.4	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	4.6		0.2	1.2	8.2	
Delay (s)	17.6		6.0	3.9	41.6	
Level of Service	B		A	A	D	
Approach Delay (s)	17.6			4.1	41.6	
Approach LOS	B			A	D	

Intersection Summary













HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	79.5	Sum of lost time (s)	22.5
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

24: KING ST & BRADDOCK RD





















12/14/2015

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		↑	↗		↑↑	↗		↑↑		↗	↑↑			
Traffic Volume (vph)	0	400	144	0	560	324	0	547	4	244	494	0		
Future Volume (vph)	0	400	144	0	560	324	0	547	4	244	494	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width	12	12	12	11	11	11	12	11	12	11	11	12		
Total Lost time (s)		1.0	1.0		6.0	6.0		1.0		6.0	1.0			
Lane Util. Factor		1.00	1.00		0.95	1.00		0.95		1.00	0.95			
Frb, ped/bikes		1.00	0.99		1.00	1.00		1.00		1.00	1.00			
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00		1.00	1.00			
Frt		1.00	0.85		1.00	0.85		1.00		1.00	1.00			
Flt Protected		1.00	1.00		1.00	1.00		1.00		0.95	1.00			
Satd. Flow (prot)		1881	1578		3421	1531		3800		1728	4000			
Flt Permitted		1.00	1.00		1.00	1.00		1.00		0.95	1.00			
Satd. Flow (perm)		1881	1578		3421	1531		3451		1728	3455			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Adj. Flow (vph)	0	400	144	0	560	324	0	547	4	244	494	0		
RTOR Reduction (vph)	0	0	54	0	0	132	0	0	0	0	0	0		
Lane Group Flow (vph)	0	400	90	0	560	192	0	551	0	244	494	0		
Confl. Peds. (#/hr)			2	2			2		2			2		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%		
Turn Type		NA	Perm		NA	Perm		NA		Prot	NA			
Protected Phases		1 2 7 8			1 2 7 8			3		4	3 4			
Permitted Phases		6	1 2 7 8		6	1 2 7 8								
Actuated Green, G (s)		98.0	98.0		98.0	98.0		25.0		24.0	55.0			
Effective Green, g (s)		103.0	103.0		98.0	98.0		30.0		24.0	60.0			
Actuated g/C Ratio		0.62	0.62		0.59	0.59		0.18		0.15	0.36			
Clearance Time (s)								6.0		6.0				
Vehicle Extension (s)								4.0		2.0				
Lane Grp Cap (vph)		1174	985		2031	909		690		251	1454			
v/s Ratio Prot		c0.21			0.16			c0.14		c0.14	0.12			
v/s Ratio Perm			0.06			0.13								
v/c Ratio		0.34	0.09		0.28	0.21		0.80		0.97	0.34			
Uniform Delay, d1		14.8	12.4		16.3	15.6		64.6		70.2	38.1			
Progression Factor		0.32	0.12		1.00	1.00		1.00		0.52	0.27			
Incremental Delay, d2		0.2	0.0		0.1	0.1		9.4		40.1	0.4			
Delay (s)		4.9	1.6		16.3	15.7		74.0		76.8	10.7			
Level of Service		A	A		B	B		E		E	B			
Approach Delay (s)		4.0			16.1			74.0			32.6			
Approach LOS		A			B			E			C			
Intersection Summary														
HCM 2000 Control Delay			29.9									HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio			0.60											
Actuated Cycle Length (s)			165.0							31.0				
Intersection Capacity Utilization			67.1%										ICU Level of Service	C
Analysis Period (min)			15											
c Critical Lane Group														

HCM Signalized Intersection Capacity Analysis

258: KENWOOD AV & KING ST

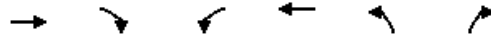
12/14/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	439	100	40	523	224	40	32	20	264	52	28
Future Volume (vph)	20	439	100	40	523	224	40	32	20	264	52	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	12	12	12	16	16	16	12	12	16
Grade (%)		0%			0%			0%			-5%	
Total Lost time (s)	6.0	6.0	6.0	6.0	1.0			6.0			6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00			1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.97	1.00	0.99			0.99			1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00			0.97	1.00
Frt	1.00	1.00	0.85	1.00	0.96			0.97			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98			0.96	1.00
Satd. Flow (prot)	1749	1845	1474	1763	1699			1978			1781	1809
Flt Permitted	0.18	1.00	1.00	0.43	1.00			0.78			0.70	1.00
Satd. Flow (perm)	329	1845	1474	807	1699			1571			1296	1809
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	439	100	40	523	224	40	32	20	264	52	28
RTOR Reduction (vph)	0	0	38	0	14	0	0	13	0	0	0	19
Lane Group Flow (vph)	20	439	62	40	733	0	0	79	0	0	316	9
Confl. Peds. (#/hr)	7		5	5		7	4		21	21		4
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	9	0	0	0	0	0	0	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		6			2			8			4	
Permitted Phases	6		6	2			8		4			4
Actuated Green, G (s)	40.4	40.4	40.4	40.4	40.4			24.7			24.7	24.7
Effective Green, g (s)	40.4	40.4	40.4	40.4	45.4			24.7			24.7	24.7
Actuated g/C Ratio	0.52	0.52	0.52	0.52	0.59			0.32			0.32	0.32
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0			6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	172	966	772	422	1000			503			415	579
v/s Ratio Prot		0.24			c0.43							
v/s Ratio Perm	0.06		0.04	0.05				0.05			c0.24	0.00
v/c Ratio	0.12	0.45	0.08	0.09	0.73			0.16			0.76	0.02
Uniform Delay, d1	9.3	11.5	9.1	9.2	11.5			18.8			23.6	17.9
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	1.4	1.5	0.2	0.4	4.8			0.2			8.5	0.0
Delay (s)	10.7	13.0	9.3	9.6	16.2			19.0			32.1	17.9
Level of Service	B	B	A	A	B			B			C	B
Approach Delay (s)		12.3			15.9			19.0			30.9	
Approach LOS		B			B			B			C	
Intersection Summary												
HCM 2000 Control Delay			17.8									B
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			77.1						12.0			
Intersection Capacity Utilization			74.9%									D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

260: Highland & KING ST

12/14/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	616	8	12	804	12	12
Future Volume (vph)	616	8	12	804	12	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	15	11	12	16	11	12
Grade (%)	0%			1%	-2%	
Total Lost time (s)	0.0			6.0	4.5	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.93	
Flt Protected	1.00			1.00	0.98	
Satd. Flow (prot)	1971			2015	1563	
Flt Permitted	1.00			0.99	0.98	
Satd. Flow (perm)	1971			1998	1563	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	616	8	12	804	12	12
RTOR Reduction (vph)	1	0	0	0	10	0
Lane Group Flow (vph)	623	0	0	816	14	0
Confl. Peds. (#/hr)		10	10		2	
Heavy Vehicles (%)	2%	2%	2%	2%	8%	8%
Bus Blockages (#/hr)	9	0	0	10	0	0
Turn Type	NA		Perm	NA	Prot	
Protected Phases	1			1	2	
Permitted Phases			1			
Actuated Green, G (s)	45.0			45.0	12.0	
Effective Green, g (s)	50.0			44.0	12.0	
Actuated g/C Ratio	0.75			0.66	0.18	
Clearance Time (s)	5.0			5.0	4.5	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	1481			1321	282	
v/s Ratio Prot	0.32				c0.01	
v/s Ratio Perm				c0.41		
v/c Ratio	0.42			0.62	0.05	
Uniform Delay, d1	3.0			6.4	22.5	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.9			2.2	0.3	
Delay (s)	3.9			8.6	22.9	
Level of Service	A			A	C	
Approach Delay (s)	3.9			8.6	22.9	
Approach LOS	A			A	C	

Intersection Summary

HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	66.5	Sum of lost time (s)	10.5
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

262: JANNEY'S LN & KING ST

12/14/2015

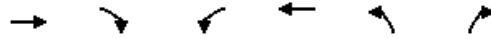
	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↘	↖	↘	↗
Traffic Volume (vph)	399	264	226	557	170	144
Future Volume (vph)	399	264	226	557	170	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	15	15
Grade (%)	-2%			-2%	0%	
Total Lost time (s)	0.5		5.0	0.5	5.0	5.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frpb, ped/bikes	0.99		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.95		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	2000		1727	1819	1928	1647
Flt Permitted	1.00		0.18	1.00	0.95	1.00
Satd. Flow (perm)	1702		335	1819	1928	1647
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	399	264	226	557	170	144
RTOR Reduction (vph)	22	0	0	0	0	0
Lane Group Flow (vph)	641	0	226	557	170	144
Confl. Peds. (#/hr)		8	8			1
Heavy Vehicles (%)	2%	2%	2%	2%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	6
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	2		1	2 1	3	
Permitted Phases			2 1			3
Actuated Green, G (s)	35.2		45.4	50.4	13.6	13.6
Effective Green, g (s)	40.2		45.4	55.4	13.6	13.6
Actuated g/C Ratio	0.54		0.61	0.74	0.18	0.18
Clearance Time (s)	5.5		5.0		5.0	5.0
Vehicle Extension (s)	4.0		0.2		4.0	4.0
Lane Grp Cap (vph)	1079		394	1352	351	300
v/s Ratio Prot	c0.32		c0.08	0.31	c0.09	
v/s Ratio Perm			0.27			0.09
v/c Ratio	0.59		0.57	0.41	0.48	0.48
Uniform Delay, d1	11.6		10.2	3.5	27.3	27.3
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4		1.3	0.1	1.4	1.6
Delay (s)	14.0		11.4	3.6	28.7	28.9
Level of Service	B		B	A	C	C
Approach Delay (s)	14.0			5.9	28.8	
Approach LOS	B			A	C	
Intersection Summary						
HCM 2000 Control Delay			13.0		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.55			
Actuated Cycle Length (s)			74.5		Sum of lost time (s)	10.5
Intersection Capacity Utilization			71.3%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Build with Improvements Conditions
AM Peak Hour

HCM Signalized Intersection Capacity Analysis

21: CHINQUAPIN DR. & KING ST

12/14/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶		↷	↶	↷	
Traffic Volume (vph)	602	119	136	864	108	54
Future Volume (vph)	602	119	136	864	108	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	12	11	12	16	12
Grade (%)	-2%			3%	-3%	
Total Lost time (s)	9.0		5.0	1.0	5.5	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frbp, ped/bikes	0.99		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.98		1.00	1.00	0.95	
Flt Protected	1.00		0.95	1.00	0.97	
Satd. Flow (prot)	1768		1591	1733	1924	
Flt Permitted	1.00		0.10	1.00	0.97	
Satd. Flow (perm)	1768		172	1733	1924	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	602	119	136	864	108	54
RTOR Reduction (vph)	6	0	0	0	15	0
Lane Group Flow (vph)	715	0	136	864	147	0
Confl. Peds. (#/hr)		12			2	
Heavy Vehicles (%)	2%	2%	8%	8%	5%	5%
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	3	
Permitted Phases			6			
Actuated Green, G (s)	53.0		93.3	93.3	15.2	
Effective Green, g (s)	50.0		93.3	98.3	15.2	
Actuated g/C Ratio	0.42		0.78	0.82	0.13	
Clearance Time (s)	6.0		5.0	6.0	5.5	
Vehicle Extension (s)	0.2		0.2	0.2	3.0	
Lane Grp Cap (vph)	736		551	1419	243	
v/s Ratio Prot	c0.40		0.07	c0.50	c0.08	
v/s Ratio Perm			0.12			
v/c Ratio	0.97		0.25	0.61	0.61	
Uniform Delay, d1	34.3		12.9	3.9	49.6	
Progression Factor	0.97		1.00	1.00	1.00	
Incremental Delay, d2	25.6		1.1	2.0	4.2	
Delay (s)	58.8		13.9	5.9	53.8	
Level of Service	E		B	A	D	
Approach Delay (s)	58.8			7.0	53.8	
Approach LOS	E			A	D	

Intersection Summary













HCM 2000 Control Delay	30.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

24: KING ST & BRADDOCK RD





















12/14/2015

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑	↗		↑↑	↗		↑↑		↗	↑↑		
Traffic Volume (vph)	0	464	432	0	480	260	0	540	4	232	436	0	
Future Volume (vph)	0	464	432	0	480	260	0	540	4	232	436	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	12	12	12	11	11	11	12	11	12	11	11	12	
Total Lost time (s)		1.0	1.0		1.0	1.0		1.0		1.0	1.0		
Lane Util. Factor		1.00	1.00		0.95	1.00		0.95		1.00	0.95		
Frb, ped/bikes		1.00	0.99		1.00	1.00		1.00		1.00	1.00		
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00		1.00	1.00		
Frt		1.00	0.85		1.00	0.85		1.00		1.00	1.00		
Flt Protected		1.00	1.00		1.00	1.00		1.00		0.95	1.00		
Satd. Flow (prot)		1881	1578		3421	1531		3800		1728	4000		
Flt Permitted		1.00	1.00		1.00	1.00		1.00		0.95	1.00		
Satd. Flow (perm)		1881	1578		3421	1531		3451		1728	3455		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	0	464	432	0	480	260	0	540	4	232	436	0	
RTOR Reduction (vph)	0	0	99	0	0	104	0	0	0	0	0	0	
Lane Group Flow (vph)	0	464	333	0	480	156	0	544	0	232	436	0	
Confl. Peds. (#/hr)			2	2			2		2	1		2	
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%	
Turn Type		NA	Perm		NA	Perm		NA		Prot	NA		
Protected Phases		1 2 7 8			1 2 7 8			3		4	3 4		
Permitted Phases		6	1 2 7 8		6	1 2 7 8							
Actuated Green, G (s)		96.0	96.0		96.0	96.0		25.0		29.0	60.0		
Effective Green, g (s)		101.0	101.0		101.0	101.0		30.0		34.0	65.0		
Actuated g/C Ratio		0.60	0.60		0.60	0.60		0.18		0.20	0.39		
Clearance Time (s)								6.0		6.0			
Vehicle Extension (s)								4.0		2.0			
Lane Grp Cap (vph)		1130	948		2056	920		678		349	1547		
v/s Ratio Prot		c0.25			0.14			c0.14		c0.13	0.11		
v/s Ratio Perm			0.21			0.10							
v/c Ratio		0.41	0.35		0.23	0.17		0.80		0.66	0.28		
Uniform Delay, d1		17.7	16.9		15.5	14.9		66.2		61.7	35.4		
Progression Factor		0.21	0.59		1.00	1.00		1.00		0.47	0.11		
Incremental Delay, d2		0.1	0.1		0.1	0.1		9.7		7.8	0.4		
Delay (s)		3.9	10.1		15.6	15.0		75.9		36.5	4.4		
Level of Service		A	B		B	B		E		D	A		
Approach Delay (s)		6.9			15.4			75.9			15.6		
Approach LOS		A			B			E			B		
Intersection Summary													
HCM 2000 Control Delay			24.3									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.54										
Actuated Cycle Length (s)			168.0									Sum of lost time (s)	10.0
Intersection Capacity Utilization			62.3%									ICU Level of Service	B
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

258: KENWOOD AV & KING ST

12/14/2015

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	14	544	210	83	546	343	53	100	25	152	100	18	
Future Volume (vph)	14	544	210	83	546	343	53	100	25	152	100	18	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	12	12	11	12	12	12	16	16	16	12	12	16	
Grade (%)		0%			0%			0%			-5%		
Total Lost time (s)	6.0	1.0	6.0	6.0	1.0			6.0			6.0	6.0	
Lane Util. Factor	1.00	*0.95	1.00	1.00	1.00			1.00			1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.91	1.00	0.98			0.99			1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	0.98	1.00			1.00			0.99	1.00	
Frt	1.00	1.00	0.85	1.00	0.94			0.98			1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.99			0.97	1.00	
Satd. Flow (prot)	1805	1805	1424	1680	1606			1988			1835	1811	
Flt Permitted	0.19	1.00	1.00	0.36	1.00			0.66			0.66	1.00	
Satd. Flow (perm)	354	1805	1424	631	1606			1332			1246	1811	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	14	544	210	83	546	343	53	100	25	152	100	18	
RTOR Reduction (vph)	0	0	37	0	12	0	0	7	0	0	0	14	
Lane Group Flow (vph)	14	544	173	83	877	0	0	171	0	0	252	4	
Confl. Peds. (#/hr)	17		30	30		17	2		9	9		2	
Heavy Vehicles (%)	0%	0%	0%	5%	5%	5%	4%	4%	4%	2%	2%	2%	
Bus Blockages (#/hr)	0	0	0	0	9	0	0	0	0	0	0	0	
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm	
Protected Phases		6			2			8			4		
Permitted Phases	6		6	2			8			4		4	
Actuated Green, G (s)	78.4	78.4	78.4	78.4	78.4			29.6			29.6	29.6	
Effective Green, g (s)	78.4	83.4	78.4	78.4	83.4			29.6			29.6	29.6	
Actuated g/C Ratio	0.65	0.70	0.65	0.65	0.70			0.25			0.25	0.25	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0			6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			4.0			4.0	4.0	
Lane Grp Cap (vph)	231	1254	930	412	1116			328			307	446	
v/s Ratio Prot		0.30			c0.55								
v/s Ratio Perm	0.04		0.12	0.13				0.13			c0.20	0.00	
v/c Ratio	0.06	0.43	0.19	0.20	0.79			0.52			0.82	0.01	
Uniform Delay, d1	7.5	8.0	8.2	8.3	12.3			39.1			42.7	34.1	
Progression Factor	1.00	1.00	1.00	0.80	0.96			1.00			1.00	1.00	
Incremental Delay, d2	0.5	1.1	0.4	0.9	4.5			1.9			16.7	0.0	
Delay (s)	8.0	9.1	8.6	7.5	16.4			41.0			59.3	34.1	
Level of Service	A	A	A	A	B			D			E	C	
Approach Delay (s)		8.9			15.6			41.0			57.7		
Approach LOS		A			B			D			E		
Intersection Summary													
HCM 2000 Control Delay			20.5									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.78										
Actuated Cycle Length (s)			120.0									Sum of lost time (s)	7.0
Intersection Capacity Utilization			93.8%									ICU Level of Service	F
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

260: Highland & KING ST

12/14/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	588	8	4	556	44	16
Future Volume (vph)	588	8	4	556	44	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	15	11	12	16	11	12
Grade (%)	0%			1%	-2%	
Total Lost time (s)	0.0			8.0	4.5	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	0.99	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.96	
Flt Protected	1.00			1.00	0.96	
Satd. Flow (prot)	1893			1919	1712	
Flt Permitted	1.00			1.00	0.96	
Satd. Flow (perm)	1893			1914	1712	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	588	8	4	556	44	16
RTOR Reduction (vph)	1	0	0	0	13	0
Lane Group Flow (vph)	595	0	0	560	47	0
Confl. Peds. (#/hr)		10	10		1	3
Heavy Vehicles (%)	4%	4%	4%	4%	0%	0%
Bus Blockages (#/hr)	14	0	0	17	0	0
Turn Type	NA		Perm	NA	Prot	
Protected Phases	1			1	2	
Permitted Phases			1			
Actuated Green, G (s)	45.0			45.0	12.0	
Effective Green, g (s)	50.0			42.0	12.0	
Actuated g/C Ratio	0.75			0.63	0.18	
Clearance Time (s)	5.0			5.0	4.5	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	1423			1208	308	
v/s Ratio Prot	c0.31				c0.03	
v/s Ratio Perm				0.29		
v/c Ratio	0.42			0.46	0.15	
Uniform Delay, d1	3.0			6.4	23.0	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.9			1.3	1.0	
Delay (s)	3.9			7.7	24.0	
Level of Service	A			A	C	
Approach Delay (s)	3.9			7.7	24.0	
Approach LOS	A			A	C	

Intersection Summary

HCM 2000 Control Delay	6.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	66.5	Sum of lost time (s)	12.5
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

262: JANNEY'S LN & KING ST

12/14/2015

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↘	↖	↘	↗
Traffic Volume (vph)	463	193	102	546	454	148
Future Volume (vph)	463	193	102	546	454	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	15	15
Grade (%)	-2%			-2%	0%	
Total Lost time (s)	0.5		5.0	5.5	0.0	5.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frpb, ped/bikes	0.99		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.96		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	2000		1678	1767	1928	1676
Flt Permitted	1.00		0.11	1.00	0.95	1.00
Satd. Flow (perm)	1732		201	1767	1928	1676
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	463	193	102	546	454	148
RTOR Reduction (vph)	16	0	0	0	0	0
Lane Group Flow (vph)	640	0	102	546	454	148
Confl. Peds. (#/hr)		7	7			
Heavy Vehicles (%)	2%	2%	5%	5%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	7
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	2		1	2 1	3	
Permitted Phases			2 1			3
Actuated Green, G (s)	35.1		46.6	51.6	24.8	24.8
Effective Green, g (s)	40.1		46.6	46.6	29.8	24.8
Actuated g/C Ratio	0.46		0.54	0.54	0.34	0.29
Clearance Time (s)	5.5		5.0		5.0	5.0
Vehicle Extension (s)	4.0		0.2		4.0	4.0
Lane Grp Cap (vph)	922		303	947	661	478
v/s Ratio Prot	c0.32		0.04	c0.31	c0.24	
v/s Ratio Perm			0.14			0.09
v/c Ratio	0.69		0.34	0.58	0.69	0.31
Uniform Delay, d1	18.5		14.5	13.5	24.5	24.3
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	4.3		0.2	0.5	3.2	0.5
Delay (s)	22.8		14.8	14.1	27.8	24.8
Level of Service	C		B	B	C	C
Approach Delay (s)	22.8			14.2	27.0	
Approach LOS	C			B	C	
Intersection Summary						
HCM 2000 Control Delay			21.2		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.68			
Actuated Cycle Length (s)			86.9		Sum of lost time (s)	10.5
Intersection Capacity Utilization			79.0%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Appendix B

Synchro Arterial LOS Outputs

Existing Conditions
AM Peak Hour

Arterial Level of Service

12/14/2015

Arterial Level of Service: EB KING ST

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
KENWOOD AV	IV	35	23.3	6.8	30.1	0.17	19.9	B
CHINQUAPIN DR.	IV	35	17.8	36.1	53.9	0.13	8.5	E
JANNEY'S LN	IV	25	136.6	19.7	156.3	0.95	21.8	B
Highland	IV	25	30.8	4.0	34.8	0.19	19.3	B
Total	IV		208.5	66.6	275.1	1.43	18.7	C

Arterial Level of Service: WB KING ST

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
JANNEY'S LN	III	25	30.8	13.3	44.1	0.19	15.2	D
CHINQUAPIN DR.	III	35	97.6	3.5	101.1	0.95	33.8	A
KENWOOD AV	III	35	16.2	8.2	24.4	0.13	18.7	C
BRADDOCK RD	III	35	21.3	76.2	97.5	0.17	6.1	F
Total	III		165.9	101.2	267.1	1.43	19.3	C

PM Peak Hour

Arterial Level of Service: EB KING ST

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
KENWOOD AV	IV	35	23.3	12.0	35.3	0.17	17.0	C
CHINQUAPIN DR.	IV	35	17.8	5.5	23.3	0.13	19.6	B
JANNEY'S LN	IV	25	136.6	12.4	149.0	0.95	22.9	B
Highland	IV	25	30.8	4.0	34.8	0.19	19.3	B
Total	IV		208.5	33.9	242.4	1.43	21.2	B

Arterial Level of Service: WB KING ST

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
JANNEY'S LN	III	25	30.8	5.3	36.1	0.19	18.6	C
CHINQUAPIN DR.	III	35	97.6	3.1	100.7	0.95	33.9	A
KENWOOD AV	III	35	16.2	9.6	25.8	0.13	17.7	D
BRADDOCK RD	III	35	21.3	74.3	95.6	0.17	6.3	F
Total	III		165.9	92.3	258.2	1.43	19.9	C

Build Conditions
AM Peak Hour

Arterial Level of Service: EB KING ST

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
KENWOOD AV	IV	35	23.3	9.6	32.9	0.17	18.2	C
CHINQUAPIN DR.	IV	35	17.8	163.1	180.9	0.13	2.5	F
JANNEY'S LN	IV	25	136.6	23.5	160.1	0.95	21.3	B
Highland	IV	25	30.8	4.0	34.8	0.19	19.3	B
Total	IV		208.5	200.2	408.7	1.43	12.6	D

Arterial Level of Service: WB KING ST

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
JANNEY'S LN	III	25	30.8	13.3	44.1	0.19	15.2	D
CHINQUAPIN DR.	III	35	97.6	6.4	104.0	0.95	32.8	A
KENWOOD AV	III	35	16.2	22.0	38.2	0.13	12.0	E
BRADDOCK RD	III	35	21.3	76.2	97.5	0.17	6.1	F
Total	III		165.9	117.9	283.8	1.43	18.1	C

PM Peak Hour

Arterial Level of Service: EB KING ST

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
KENWOOD AV	IV	35	23.3	15.2	38.5	0.17	15.5	C
CHINQUAPIN DR.	IV	35	17.8	19.5	37.3	0.13	12.2	D
JANNEY'S LN	IV	25	136.6	15.0	151.6	0.95	22.5	B
Highland	IV	25	30.8	4.0	34.8	0.19	19.3	B
Total	IV		208.5	53.7	262.2	1.43	19.6	B

Arterial Level of Service: WB KING ST

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
JANNEY'S LN	III	25	30.8	5.3	36.1	0.19	18.6	C
CHINQUAPIN DR.	III	35	97.6	4.5	102.1	0.95	33.4	A
KENWOOD AV	III	35	16.2	19.0	35.2	0.13	13.0	E
BRADDOCK RD	III	35	21.3	74.3	95.6	0.17	6.3	F
Total	III		165.9	103.1	269.0	1.43	19.1	C

Build with Improvements Conditions
AM Peak Hour

Arterial Level of Service: EB KING ST

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
KENWOOD AV	IV	35	23.3	10.5	33.8	0.17	17.7	C
CHINQUAPIN DR.	IV	35	17.8	59.0	76.8	0.13	5.9	F
JANNEY'S LN	IV	25	136.6	23.5	160.1	0.95	21.3	B
Highland	IV	25	30.8	4.0	34.8	0.19	19.3	B
Total	IV		208.5	97.0	305.5	1.43	16.8	C

Arterial Level of Service: WB KING ST

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
JANNEY'S LN	III	25	30.8	13.3	44.1	0.19	15.2	D
CHINQUAPIN DR.	III	35	97.6	6.6	104.2	0.95	32.8	A
KENWOOD AV	III	35	16.2	18.6	34.8	0.13	13.1	E
BRADDOCK RD	III	35	21.3	76.2	97.5	0.17	6.1	F
Total	III		165.9	114.7	280.6	1.43	18.3	C