

Bank Street at Mitch Owens Road Commercial Development Traffic Impact Assessment Update

To:	Amira Shehata City of Ottawa	From:	Robert Vastag, MCIP, RPP 400 - 1331 Clyde Avenue Ottawa, ON K2C 3G4
File:	163600949	Date:	March 4, 2014

Reference: Bank Street at Mitch Owens Road Commercial Development Traffic Impact Assessment Update

1.0 INTRODUCTION

In June of 2012 the *Bank Street at Mitch Owens Road Commercial Development Transportation Impact Assessment* (the 2012 TIA) was prepared by GENIVAR to support a rezoning application for a 12-acre vacant parcel of land located at the south-west corner of the Bank Street at Mitch Owens Road intersection in the City of Ottawa. The proposed retail / commercial development features a combined gross floor area of roughly 10,000 square meters spread over six individual building pads.

The 2012 TIA identified improvements as being required at the Bank Street at Mitch Owens Road intersection (among other improvements identified at other locations that are not the subject of this update). The improvements identified at the Bank Street at Mitch Owens Road intersection (the subject intersection) were required to address a combination of existing deficiencies, future background growth and site traffic generated by the development proposal.

Since the completion of the 2012 TIA there have been two notable updates. First, the City of Ottawa's Transportation Master Plan has been updated and the Bank Street widening in the vicinity of the site is no longer within the affordable transportation network. In the 2012 TIA this improvement was identified as being required to accommodate background growth up to the 2019 ultimate horizon. Second, there are more recent turning movement counts available at the Bank Street at Mitch Owens Road intersection that were conducted in 2013.

Through discussions with the City of Ottawa it was determined that an update to the 2012 TIA would be required. The purpose of this memorandum, therefore, is to update the findings of 2012 TIA and to confirm the transportation improvements required at the Bank Street at Mitch Owens Road intersection.

It is noted that the author of the 2012 TIA is the same as the author of the subject memorandum.

2.0 METHODOLOGY

As discuss with the City of Ottawa, the focus of this memo will be to update the assessment of intersection operations at the Bank Street at Mitch Owens Road intersection.

The methodology utilized in this update is outlined as follows:

Reference: Bank Street at Mitch Owens Road Commercial Development Traffic Impact Assessment Update

- Existing traffic conditions will be updated and assessed using the most recent traffic counts available at the Bank Street at Mitch Owens Road intersection (counts from 2013 to assess AM and PM peak hours; counts from 2012 to assess the Saturday peak)
- In the assessment of future background conditions growth from other known background developments will be consistent with the assumptions of the 2012 TIA.
- In the assessment of future background conditions the historic rate of growth assumed in the 2012 TIA will be revisited based on the newly available traffic count information
- Site generated traffic volumes will be taken directly from the 2012 TIA
- The study horizon years will be adjusted by one year to reflect the commercial development's anticipated opening-day of 2015. The ultimate horizon (i.e. the plus 5 year horizon), therefore, will be 2020.

3.0 TRANSPORTATION FORECASTS

The most recent available intersection turning movement counts at the Bank Street at Mitch Owen Road intersection from 2013 were provided by the City of Ottawa for the weekday condition. Traffic counts from the 2012 TIA were used to assess the Saturday mid-day condition (the Saturday counts were conducted in 2012).

Appendix A includes the intersection turning movement count summaries.

Table 1 provides a summary of the overall growth experienced at the Bank Street and Mitch Owens Road intersection between 2010 to 2013.

Table 1
Growth in Overall Peak Hour Traffic Volumes at the Bank Street / Mitch Owens Road Intersection

Peak Hour	Count Year ⁽¹⁾			2010 to 2012		2012 to 2013		2010 to 2013	
	2010	2012	2013	Growth	Annual Growth %	Growth	Annual Growth %	Growth	Annual Growth %
AM	1922	1596	1565	(326)	(8.5%)	(31)	(1.9%)	(357)	(6.2%)
PM	2020	1987	1771	(33)	(0.8%)	(216)	(10.9%)	(249)	(4.1%)

⁽¹⁾ Traffic volumes represent overall intersection totals for the peak hour

As shown in the above table, there has been a net decline in the overall peak hour traffic volumes at the Bank Street / Mitch Owens Road intersection during the period between 2010 to 2013.

Reference: Bank Street at Mitch Owens Road Commercial Development Traffic Impact Assessment Update

To remain conservative in the assessment, existing traffic volumes were not adjusted to represent the historic decline identified in **Table 1**. Furthermore, the observed rate of peak hour traffic decline was not applied to the traffic forecasts. In lieu of a background growth rate, only traffic generated by known area developments was explicitly added to the future road network. As noted earlier, the traffic generated by other area background developments is consistent with what was assumed in the 2012 TIA.

Table 2 below provides a summary of the existing and forecasted traffic volumes at the Bank Street / Mitch Owens Road intersection.

Bank Street at Mitch Owens Road Commercial Development Traffic Impact Assessment Update

Table 2
Existing and Future Traffic Volumes at the Bank Street / Mitch Owens Intersection

Horizon	Peak	Eastbound				Westbound				Northbound				Southbound				Intersection Total
		L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Existing	AM	297	133	61	491	15	121	46	182	131	524	12	667	13	105	107	225	1565
	PM	95	228	54	377	3	167	36	206	48	244	11	303	29	679	177	885	1771
	SAT	97	75	65	237	5	69	33	107	76	208	6	290	46	278	108	432	1066
2015 Future Background	AM	297	133	97	526	23	121	46	189	149	577	14	740	13	190	107	310	1765
	PM	95	228	87	409	12	167	36	214	106	447	26	579	29	857	177	1063	2266
	SAT	97	75	135	307	10	69	33	12	160	439	13	611	46	578	108	732	1763
2015 Total Future	AM	323	135	97	554	26	128	46	199	185	562	14	761	13	196	110	319	1833
	PM	156	256	87	498	20	178	36	233	156	422	26	604	29	904	205	1138	2474
	SAT	224	109	135	468	16	84	33	133	275	358	13	645	46	643	132	821	2068
2020 Ultimate	AM	326	136	97	559	25	128	47	200	186	562	15	763	13	196	110	319	1841
	PM	156	257	87	501	20	180	36	235	157	422	26	605	29	904	209	1142	2482
	SAT	232	116	140	488	16	92	32	141	282	357	13	653	46	643	148	837	2118

Bank Street at Mitch Owens Road Commercial Development Traffic Impact Assessment Update

4.0 TRANSPORTATION ASSESSMENT

4.1 EXISTING CONDITIONS

Table 3 below provides a summary of existing intersection operations.

Table 3
Existing Traffic Operations at the Bank Street / Mitch Owens Road Intersection

Scenario	Peak Hour	Intersection Operations				Recommended Mitigation
		LOS	v/c	Delay (s)	Critical Movements	
Prior to Improvements	AM	D	0.88	45.5	EBT/L, 1.05	Signal timing adjustments
	PM	D	0.88	45.4	none	None
	SAT	A	0.38	17.7	none	None
Following Improvements	AM	D	0.84	29.0	none	
	PM	D	0.88	45.4	none	
	SAT	A	0.38	17.7	None	

As shown in the above table, during the AM peak hour the eastbound shared left / through movement exceeds capacity. Signal timing adjustment and optimization will permit the intersection to function acceptably. In particular, the southbound left turn advanced phase should be eliminated given the low volumes experienced by this movement and this time should be reallocated to other, more heavily utilized movements.

Detailed intersection performance worksheets can be found in **Appendix B**.

4.2 2015 FUTURE BACKGROUND CONDITIONS

Table 4 below provides a summary of 2015 future background intersection operations.

Table 4
2015 Future Background Traffic Operations at the Bank Street / Mitch Owens Road Intersection

Scenario	Peak Hour	Intersection Operations				Recommended Mitigation
		LOS	v/c	Delay (s)	Critical Movements	
Optimized Signal Timings	AM	D	0.82	26.7	none	Optimized signal timing
	PM	D	0.86	26.1	none	Optimized signal timing
	SAT	A	0.52	14.2	none	Optimized signal timing

As shown in the above table, with the signal phasing and timing plans optimized the intersection is expected to operate satisfactorily.

Reference: Bank Street at Mitch Owens Road Commercial Development Traffic Impact Assessment Update

Detailed intersection performance worksheets can be found in **Appendix B**.

4.3 2015 TOTAL FUTURE CONDITIONS

Table 5 below provides a summary of 2015 total future intersection operations.

Table 5
2015 Total Future Traffic Operations at the Bank Street / Mitch Owens Road Intersection

Scenario	Peak Hour	Intersection Operations				Recommended Mitigation
		LOS	v/c	Delay (s)	Critical Movements	
Prior to Improvements	AM	D	0.84	29.0	none	None
	PM	F	1.13	167.6	EBL/T - 1.14 NBL - 1.08 SBT - 1.10	Add EB and WB LTLs
	SAT	D	0.88	27.4	none	None
Following Improvements	AM	B	0.70	24.6	none	
	PM	C	0.80	46.5	none	
	SAT	C	0.71	20.3	none	

It is noted that in order to facilitate the commercial development's proposed Bank Street access, the massive eastbound right turn channel at the Bank Street / Mitch Owens Road intersection must be reconstructed to reflect a more typical design treatment for a right turn lane (i.e. smart channel). This improvement has been assumed in the above intersection performance analysis.

As shown in the above table, with the addition of site traffic during the PM peak hour, the eastbound shared left / through, the northbound left turn, and the southbound through movements are expected to exceed capacity. To correct these anticipated deficiencies, the intersection requires exclusive eastbound and westbound left turn lanes in order for the intersection to operate satisfactorily.

Detailed intersection performance worksheets can be found in **Appendix B**.

4.4 2020 ULTIMATE FUTURE CONDITIONS

Table 6 below provides a summary of 2020 ultimate future intersection operations.

Reference: Bank Street at Mitch Owens Road Commercial Development Traffic Impact Assessment Update

Table 6
2020 Ultimate Future Traffic Operations at the Bank Street / Mitch Owens Road Intersection

Scenario	Peak Hour	Intersection Operations				Recommended Mitigation
		LOS	v/c	Delay (s)	Critical Movements	
Optimized Signal Timings	AM	C	0.73	25.4	none	Optimized signal timing
	PM	D	0.82	27.3	none	Optimized signal timing
	SAT	D	0.83	22.6	none	Optimized signal timing

As shown in the above table, with the improvements identified during the 2015 total future horizon the intersection is expected to operate satisfactorily 5 years beyond the build-out of the subject development.

Detailed intersection performance worksheets can be found in **Appendix B**.

5.0 CONCLUSIONS

The proposed retail-commercial development at the south-west corner of the Bank Street at Mitch Owen Road intersection will trigger the following intersection improvements at the subject intersection:

- The long-contemplated eastbound and westbound left turn lanes will be required in order for the intersection to operate acceptably. By 2020, the proposed development is expected to contribute roughly 30% of the overall peak hour traffic volumes projected for the eastbound left turn movement.
- To facilitate the commercial development's proposed Bank Street access the massive existing eastbound right turn channelized ramp at the Bank Street / Mitch Owens Road intersection will need to be reconstructed and replaced by a more convention right turn lane treatment (i.e. smart channel).

The attached Figures 1 and 2 illustrate two potential conceptual designs of the improvements identified above. In the attached concepts there are subtle differences to the southbound receiving lanes on Bank Street; Figure 1 shows a potential design treatment with no weaving zone whereas the Figure 2 concept includes a weaving area on Bank Street.

With the above improvements, the intersection is expected to operate satisfactorily and the development should be permitted to proceed.

Our client wishes to proceed with the detailed design of the subject improvements, and as such, we seek the City's comments and overall acceptance of the proposed improvements and any preliminary comments related to the conceptual designs. We would be pleased to meet with you to discuss the above in greater detail.

Reference: Bank Street at Mitch Owens Road Commercial Development Traffic Impact Assessment Update

Should you have any questions or concerns please feel free to contact the undersigned at your earliest convenience.

Stantec Consulting Ltd.



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Robert.Vastag@stantec.com

Attachments: Appendix A – Intersection Turning Movement Counts
Appendix B – Detailed Intersection Analysis Worksheets
Figure 1 – Bank Street at Mitch Owens Road – Conceptual (without weave on Bank Street)
Figure 2 – Bank Street at Mitch Owens Road – Conceptual (with weave on Bank Street)

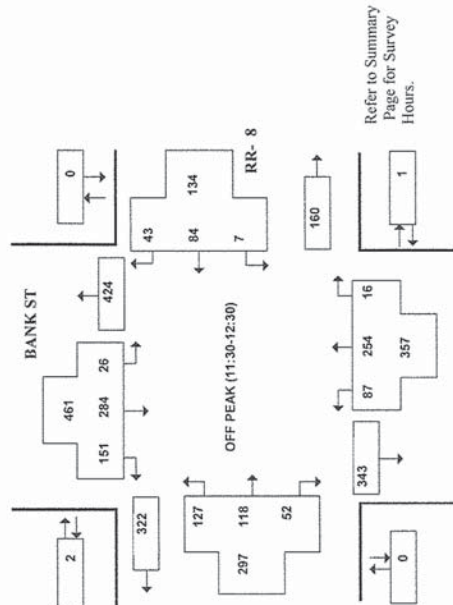
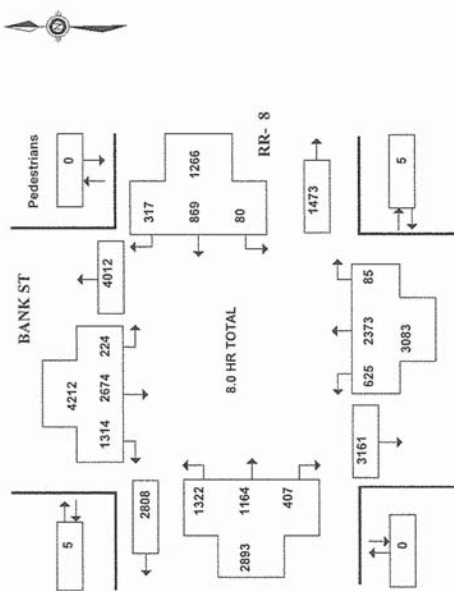
Appendix A – Intersection Turning Movement Counts

MITCH OWENS RD and BANK ST (ULRS Listing RR- 8 & BANK ST)

Survey Date: Thursday 27 June 2013
Conditions: dry
Start Time: 0700

Total Observed U-Turns
 Northbound: 0 Southbound: 0
 Eastbound: 0 Westbound: 0

AAADT Factor
 Thursday in June is
 0.9



Approved by : AWI

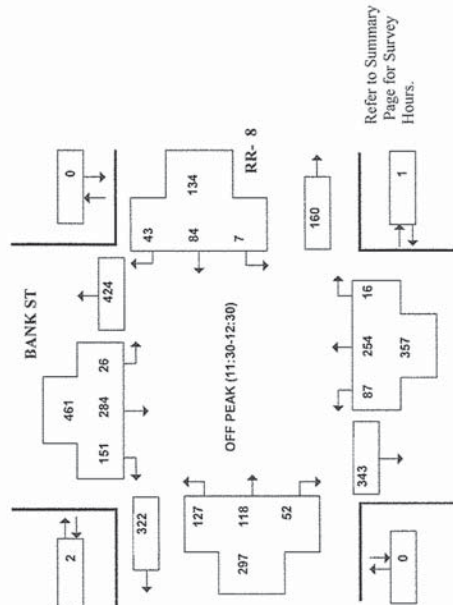
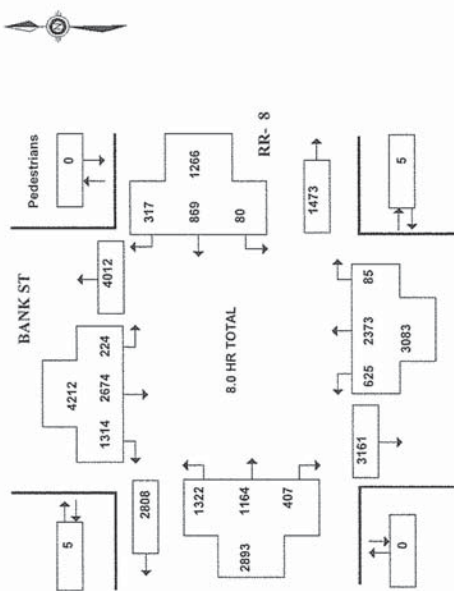
Printed on : 13/02/2014

MITCH OWENS RD and BANK ST (ULRS Listing RR- 8 & BANK ST)

Survey Date: Thursday 27 June 2013
Conditions: dry
Start Time: 0700

Total Observed U-Turns
 Northbound: 0 Southbound: 0
 Eastbound: 0 Westbound: 0

AAADT Factor
 Thursday in June is
 0.9



Approved by : AWI

Printed on : 13/02/2014



Vehicular Turning Movements - Summary

MITCH OWENS RD and BANK ST

(ULRS Listing RR- 8 & BANK ST)

Survey Date: Thursday 27 June 2013
Conditions: dry
Start Time: 0700

Total Observed U-Turns
Northbound: 0 Southbound: 0
Eastbound: 0 Westbound: 0

AAADT Factor
Thursday in June is
0.9

Time Period	BANK ST						RR- 8																									
	Northbound			Southbound			SUB			STR			Eastbound			SUB			Westbound			SUB			STR			GRAND				
	LT	ST	RT	LT	ST	RT	LT	ST	RT	LT	ST	RT	LT	ST	RT	LT	ST	RT	LT	ST	RT	LT	ST	RT	LT	ST	RT	LT	ST	RT		
07:00-08:00	131	524	12	667	13	105	107	225	892	297	133	61	491	15	121	46	182	673	1565													
08:00-09:00	113	372	7	492	16	138	91	245	737	236	149	73	458	12	96	39	147	605	1342													
09:00-10:00	74	271	8	353	18	179	139	336	689	199	155	46	400	11	88	61	160	560	1249													
11:30-12:30	87	254	16	357	26	284	151	461	818	127	118	52	297	7	84	43	134	431	1249													
12:30-13:30	70	207	15	292	32	300	146	478	770	114	89	32	235	3	69	29	101	336	1106													
15:00-16:00	59	264	9	332	47	424	243	714	1046	151	116	37	304	20	119	46	185	489	1535													
16:00-17:00	43	237	7	287	43	565	260	868	1155	103	176	52	331	9	125	17	151	482	1637													
17:00-18:00	48	244	11	303	29	679	177	885	1188	95	228	54	377	3	167	36	206	583	1771													
8.0 HR TOTAL	625	2373	85	3083	224	2674	1314	4212	7295	1322	1164	407	2893	80	869	317	1266	4159	11454													

EQU. 12 HR TOTAL 868 3296 118 4284 311 3716 1826 5853 10137 1837 1617 565 4019 111 1207 440 1758 5777 15914

Note: These values are calculated by multiplying the totals by the appropriate expansion factor.

AVG. 12 HR TOTAL 781 2968 106 3855 279 3344 1643 5266 9121 1653 1455 508 3616 99 1086 396 1581 5197 14318

Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.

AVG. 24 HR TOTAL 1023 3898 138 5049 365 4393 2152 6897 11946 2165 1906 665 4736 129 1422 518 2069 6805 18751

Note: These volumes were calculated by multiplying the Average Daily 12 hr totals by 1.31.

AM TOTAL (0700-0900) 244 896 19 1155 29 243 198 470 1629 533 282 134 949 27 217 85 329 1278 2507

PM TOTAL (1530-1730) 93 498 18 605 86 1140 478 1704 2313 239 327 89 655 21 267 55 343 998 3311



Vehicular Turning Movements (15 Min. Volumes)

MITCH OWENS RD and BANK ST

(ULRS Listing RR- 8 & BANK ST)

Survey Date: Thursday 27 June 2013
Conditions: dry
Start Time: 07:00

Total Observed U-Turns
Northbound: 0 Southbound: 0
Eastbound: 0 Westbound: 0

AAADT Factor
Thursday in June is
0.9

Time Period	BANK ST					RR- 8													
	Northbound		Southbound		SUB TOT	Eastbound		Westbound		SUB TOT	STR TOT	GRAND TOT							
	LT	RT	LT	RT		LT	RT	LT	RT										
07:00-07:15	29	148	3	180	1	14	21	36	216	81	25	2	108	3	25	3	31	139	355
07:15-07:30	41	126	6	173	4	16	33	53	226	73	43	11	127	4	35	18	57	184	410
07:30-07:45	36	140	2	178	3	34	19	56	234	62	30	31	123	3	31	14	48	171	405
07:45-08:00	25	110	1	136	5	41	34	80	216	81	35	17	133	5	30	11	46	179	395
08:00-08:15	29	96	3	128	6	22	16	44	172	54	31	6	91	0	16	11	27	118	290
08:15-08:30	32	110	1	143	3	28	17	48	191	77	60	10	147	4	31	8	43	190	381
08:30-08:45	29	75	1	105	4	42	25	71	176	47	31	40	118	3	23	13	39	157	333
08:45-09:00	23	91	2	116	3	46	33	82	198	58	27	17	102	5	26	7	38	140	338
09:00-09:15	21	68	3	92	5	59	33	97	189	49	40	9	98	8	22	27	57	155	344
09:15-09:30	25	79	4	108	6	39	38	83	191	59	44	17	120	1	30	10	41	161	352
09:30-09:45	14	60	1	75	7	50	37	94	169	36	24	14	74	2	21	18	41	115	284
09:45-10:00	14	64	0	78	0	31	31	62	140	55	47	6	108	0	15	6	21	129	269
11:30-11:45	32	80	4	116	4	57	37	98	214	28	28	17	73	4	12	10	26	99	313
11:45-12:00	18	49	3	70	6	81	38	125	195	26	28	3	57	1	20	14	35	92	287
12:00-12:15	21	68	3	92	10	66	40	116	208	37	29	19	85	0	20	8	28	113	321
12:15-12:30	16	57	6	79	6	80	36	122	201	36	33	13	82	2	32	11	45	127	328
12:30-12:45	24	65	7	96	8	54	28	90	186	30	20	3	53	2	20	7	29	82	268
12:45-13:00	18	43	2	63	7	69	42	118	181	19	17	2	38	0	11	8	19	57	238
13:00-13:15	18	60	2	80	10	85	35	130	210	44	18	14	76	1	16	6	23	99	309
13:15-13:30	10	39	4	53	7	92	41	140	193	21	34	13	68	0	22	8	30	98	291
15:00-15:15	12	77	0	89	5	89	46	140	229	23	23	3	49	5	13	5	23	72	301
15:15-15:30	14	53	1	68	9	86	68	163	231	36	31	11	78	4	27	12	43	121	352
15:30-15:45	14	60	2	76	12	128	57	197	273	52	31	18	101	6	41	14	61	162	435
15:45-16:00	19	74	6	99	21	121	72	214	313	40	31	5	76	5	38	15	58	134	447
16:00-16:15	15	67	1	83	15	147	61	223	306	20	43	6	69	3	37	10	50	119	425
16:15-16:30	8	45	4	57	9	141	74	224	281	44	55	22	121	3	26	4	33	154	435
16:30-16:45	11	80	0	91	10	163	58	231	322	26	34	12	72	0	26	1	27	99	421
16:45-17:00	9	45	2	56	9	114	67	190	246	13	44	12	69	3	36	2	41	110	356
17:00-17:15	12	67	3	82	4	132	49	185	267	17	20	5	42	1	32	3	36	78	345
17:15-17:30	5	60	0	65	6	194	40	240	305	27	69	9	105	0	31	6	37	142	447
17:30-17:45	9	73	1	83	9	171	46	226	309	25	81	21	127	2	43	8	53	180	489
17:45-18:00	22	44	7	73	10	182	42	234	307	26	58	19	103	0	61	19	80	183	490

MITCH OWENS RD and BANK ST

(ULRS Listing RR- 8 & BANK ST)

Count ID : 31980

Survey Date : Thursday 27 June 2013

Conditions : dry

Start Time : 0700

Time Period	CROSSING BANK ST N/B APPROACH	CROSSING BANK ST S/B APPROACH	STREET TOTAL	CROSSING RR- 8 E/B APPROACH	CROSSING RR- 8 W/B APPROACH	STREET TOTAL	GRAND TOTAL
07:00-08:00	1	0	1	0	0	0	1
08:00-09:00	0	1	1	0	0	0	1
09:00-10:00	0	0	0	0	0	0	0
10:00-11:00	1	2	3	0	0	0	3
11:00-12:00	0	0	0	0	0	0	0
12:00-13:00	1	0	1	0	0	0	1
13:00-14:00	0	2	2	0	0	0	2
14:00-15:00	0	0	0	0	0	0	0
15:00-16:00	0	0	0	0	0	0	0
16:00-17:00	0	0	0	0	0	0	0
17:00-18:00	0	0	0	0	0	0	0
8.0 HR TOTAL	5	5	10	0	0	0	10

PEAK PERIOD SUMMARIES

AM PEAK PERIOD (7:00-9:00)									
07:00-07:15	1								1
07:15-07:30		0	0	0	0	0	0	0	0
07:30-07:45		0	0	0	0	0	0	0	0
07:45-08:00		0	0	0	0	0	0	0	0
08:00-08:15		0	0	0	0	0	0	0	0
08:15-08:30		0	1						1
08:30-08:45		0	0	0	0	0	0	0	0
08:45-09:00		0	0	0	0	0	0	0	0
TOTALS	1	1	2	0	0	0	0	0	2

Bicycle Volume Summary Sheet - Hourly Volumes

MITCH OWENS RD and BANK ST

(ULRS Listing RR- 8 & BANK ST)

Survey Date: Thursday 27 June 2013

Start Time: 0700

Conditions: dry

Survey Date: Monday 20 August 2012

Conditions: dry

Start Time: 0700

Total Observed U-Turns

Northbound: 0 Southbound:

Eastbound: 0 Westbound: 0

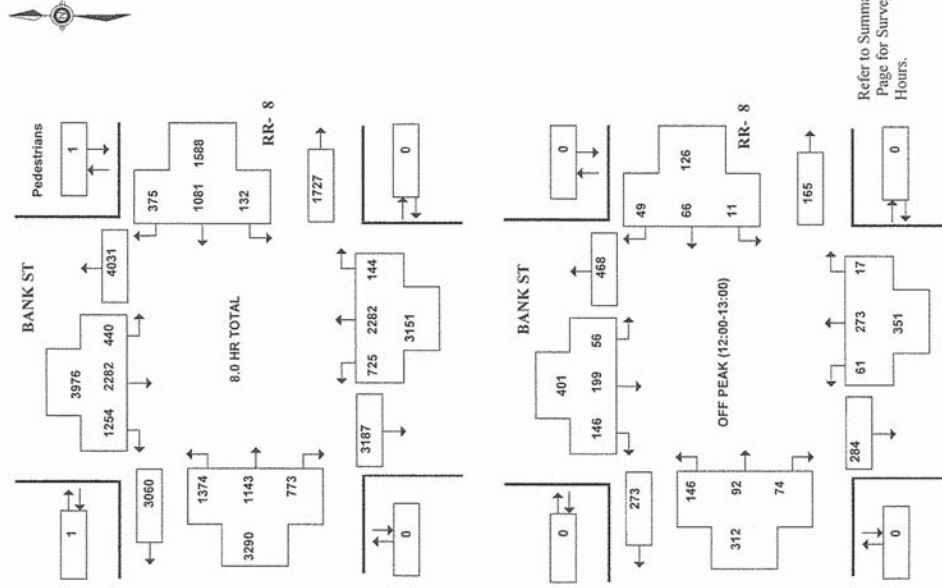
AADT Factor

Monday in August is

1

Time Period	NORTHBOUND APPROACH ON BANK ST	SOUTHBOUND APPROACH ON BANK ST	STREET TOTAL	EASTBOUND APPROACH ON RR- 8	WESTBOUND APPROACH ON RR- 8	STREET TOTAL	GRAND TOTAL
07:00-08:00	0	0	0	0	0	0	0
08:00-09:00	0	0	0	0	0	0	0
09:00-10:00	0	0	0	0	0	0	0
11:30-12:30	2	0	2	0	0	0	2
12:30-13:30	0	0	0	1	0	1	1
15:00-16:00	0	0	0	2	0	2	2
16:00-17:00	0	0	0	0	0	0	0
17:00-18:00	0	0	0	0	0	0	0
8.0 HR TOTAL	2	0	2	3	0	3	5

Note: These volumes consists of bicycles only (no mopeds or motorcycles) and ARE NOT included in the Turning Movement Count Summary.

Refer to Summary
Page for Survey
Hours.

Approved by: AWD

Approved by: DT

Printed on : 13/02/2014

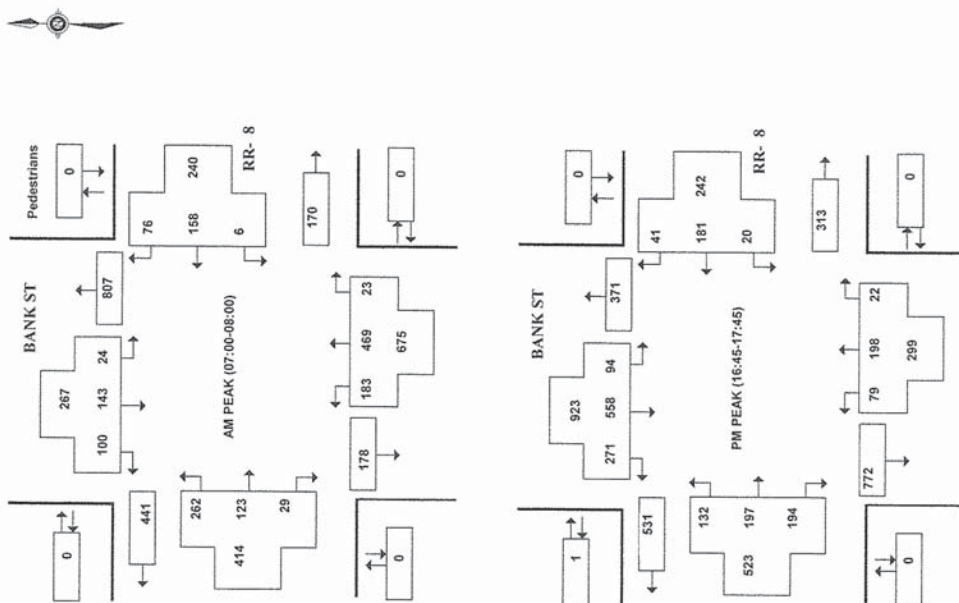
MITCH OWENS RD and BANK ST

(ULRS Listing RR- 8 & BANK ST)

Survey Date: Monday 20 August 2012		Total Observed U-Turns		AADT Factor
Conditions:	dry	Northbound: 0	Southbound: 0	Monday in August is
Start Time:	0700	Eastbound: 0	Westbound: 0	†

AADT Factor

Monday in August is



Approved by: DT

Printed on : 13/02/2014

Public Works and Services Department

Vehicular Turning Movements - Summary

MITCH OWENS RD and BANK ST

(ULRS Listing RR- 8 & BANK ST)

Survey Date: Monday 20 August 2012		Total Observed U-Turns		AADT Factor
Conditions:	dry	Northbound: 0	Southbound: 0	Monday in August is
Start Time:	0700	Eastbound: 0	Westbound: 0	1

AADT Factor

Monday in August is

1

Time Period	BANK ST						RR-8													
	Northbound			Southbound			Eastbound			Westbound										
	LT	ST	RT	SUB	TOT	RT	SUB	TOT	LT	ST	RT	SUB	TOT	LT	ST	RT	SUB	TOT	RT	SUB
07:00-08:00	183	469	23	675	24	143	100	267	942	262	123	29	414	6	158	76	240	654	1596	
08:00-09:00	103	354	26	483	23	153	108	284	767	221	165	68	454	9	122	47	178	632	1399	
09:00-10:00	87	272	8	367	34	198	100	322	699	157	113	65	335	23	96	39	158	483	1192	
11:00-12:30	56	262	12	330	47	213	127	387	717	132	99	57	288	18	67	45	130	418	1135	
12:30-13:30	64	266	17	347	46	170	129	345	692	157	76	69	302	13	99	50	162	484	1156	
15:00-16:00	73	256	17	346	67	368	199	634	880	156	139	136	431	19	134	34	187	618	1598	
16:00-17:00	73	220	14	307	92	531	211	834	1141	162	207	160	529	26	221	45	292	821	1982	
17:00-18:00	86	183	27	296	107	506	280	893	1169	127	221	189	537	18	184	39	241	778	1967	
8.0 HR TOTAL	725	2282	144	3151	440	2232	1254	3976	7127	1374	1143	773	3290	132	1081	375	1586	4878	12005	

EQU. 12 HR TOTAL	1007	3171	200	4378	611	3171	1743	5525	9803	1909	1588	1074	4571	183	1502	521	2206	6777	16680
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Note: These values are calculated by multiplying the totals by the appropriate expansion factor.

AVG. 12 HR TOTAL 1007 3171 200 4378 611 3171 1743 5525 9903 1909 1588 1074 4571 183 1502 521 2206 6777 16680

Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.

AVG. 24 HR TOTAL 1319 4154 262 5735 800 4154 2283 7237 12972 2500 2080 1406 5986 239 1957 682 2888 8874 21846

Note: These volumes were calculated by multiplying the Average Daily 12 hr totals by 1.31.

AM TOTAL (0700-0900)	286	823	49	1156	47	296	208	551	1709	483	288	97	868	15	280	123	418	1286	2995
PM TOTAL (1500-1700)	143	436	36	616	183	1009	460	1652	2267	297	386	334	1017	50	378	82	510	1527	3794



Public Works and Services Department
Vehicular Turning Movements (15 Min. Volumes)

Count ID 31351

MITCH OWENS RD and BANK ST
(ULRS Listing RR- 8 & BANK ST)

Survey Date: Monday 20 August 2012
Conditions: dry
Start Time: 07:00
Total Observed U-Turns
Northbound: 0 Southbound: 0
Eastbound: 0 Westbound: 0
AADT Factor
Monday in August is
1

Time Period	BANK ST					RR- 8					AADT Factor									
	Northbound					Southbound					Eastbound					Westbound				
	LT	ST	RT	TOT	SUB	LT	ST	RT	TOT	SUB	LT	ST	RT	TOT	SUB	LT	ST	RT	TOT	SUB
07:00-07:15	66	111	12	189	2	34	23	59	248	49	31	4	84	0	44	32	76	160	408	
07:15-07:30	38	122	7	167	9	20	24	53	220	66	35	7	108	2	44	11	57	165	385	
07:30-07:45	39	126	1	166	4	47	24	75	241	80	25	15	120	1	40	18	59	179	420	
07:45-08:00	40	110	3	153	9	42	29	80	233	67	32	3	102	3	30	15	48	150	383	
08:00-08:15	28	96	9	133	7	33	25	65	198	68	42	8	118	1	33	11	45	163	361	
08:15-08:30	23	85	7	115	5	34	19	58	173	45	39	10	94	3	26	14	43	137	310	
08:30-08:45	26	104	8	138	10	36	22	68	206	43	48	14	105	3	37	15	55	160	366	
08:45-09:00	26	69	2	97	1	50	42	93	190	65	36	36	137	2	26	7	35	172	362	
09:00-09:15	24	82	3	109	6	49	28	83	192	36	18	15	69	5	27	8	40	109	301	
09:15-09:30	22	50	3	75	11	35	24	70	145	42	41	12	95	4	25	14	43	138	283	
09:30-09:45	23	75	1	99	9	59	26	94	193	37	27	20	84	8	19	7	34	118	311	
09:45-10:00	18	65	1	84	8	55	22	85	169	42	27	18	87	6	25	10	41	128	297	
10:00-10:15	14	46	3	63	10	56	28	94	157	31	29	14	74	4	16	12	32	106	263	
10:15-10:30	10	68	3	81	12	47	28	87	168	34	29	11	74	8	22	7	37	111	279	
10:30-10:45	18	74	3	95	15	55	35	105	200	34	21	20	75	2	10	15	27	102	302	
10:45-11:00	14	74	3	91	10	55	36	101	192	33	20	12	65	4	19	11	34	99	291	
11:00-11:15	14	58	5	77	14	38	38	90	167	39	22	19	80	2	16	9	27	107	274	
11:15-11:30	15	67	6	88	17	51	37	105	193	40	29	23	92	3	21	14	38	130	323	
11:30-11:45	13	63	2	78	5	56	30	91	169	29	11	15	55	2	24	10	36	91	260	
11:45-12:00	22	78	4	104	10	25	24	59	163	49	14	12	75	6	38	17	61	136	299	
12:00-12:15	20	62	6	88	13	73	49	135	223	25	35	23	83	5	33	8	46	129	352	
12:15-12:30	20	71	4	95	20	81	44	145	240	49	29	24	102	2	30	8	40	142	382	
12:30-12:45	16	63	5	84	17	93	55	165	249	31	37	42	110	4	32	9	45	155	404	
12:45-13:00	17	60	2	79	17	121	51	189	268	51	38	47	136	8	39	9	56	192	480	
12:45-13:15	23	59	4	86	32	122	60	214	300	41	60	39	140	3	47	10	60	200	500	
12:45-13:30	16	49	2	67	24	133	46	203	270	43	46	43	132	10	45	8	63	195	485	
12:45-13:45	19	61	5	85	21	114	46	181	266	35	51	35	121	9	77	15	101	222	488	
12:45-14:00	15	51	3	69	15	162	59	236	305	43	50	43	136	4	52	12	68	204	509	
12:45-14:15	21	37	10	68	29	128	77	234	302	25	51	44	120	5	43	11	59	179	481	
12:45-14:30	16	56	5	77	28	136	66	230	307	28	53	41	122	7	43	8	58	180	487	
12:45-14:45	27	54	4	85	22	132	69	223	308	36	43	66	145	4	43	10	57	202	510	
12:45-15:00	22	36	8	66	28	110	68	206	272	38	74	38	150	2	55	10	67	217	489	

Approved by: DT

Printed on : 13/02/2014



Public Works and Services Department

Pedestrian Volume Summary Sheet - Hourly Volumes

Count ID 31351

MITCH OWENS RD and BANK ST
(ULRS Listing RR- 8 & BANK ST)

Survey Date: Monday 20 August 2012
Conditions: dry
Start Time: 0700

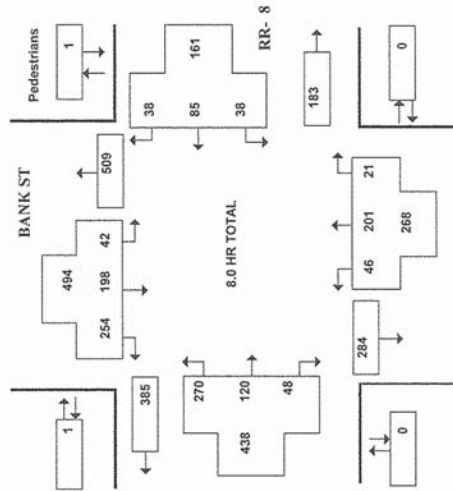
Time Period	CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING		CROSSING	
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MITCH OWENS RD and BANK ST
(ULRS Listing RR- 8 & BANK ST)

Survey Date : Monday 20 August 2012

Conditions : dry

Start Time : 0700



Time Period	Northbound				Southbound				Eastbound				Westbound				RR- 8			
	LT	ST	RT	TOT	LT	ST	RT	TOT	LT	ST	RT	TOT	LT	ST	RT	TOT	LT	ST	RT	TOT
07:00-08:00	7	17	1	25	6	26	35	67	92	35	16	3	54	4	18	6	28	82	174	
08:00-09:00	4	37	5	46	4	30	41	75	121	44	18	5	67	5	20	7	32	99	220	
09:00-10:00	4	30	0	34	5	34	34	73	107	41	11	7	59	11	7	4	22	81	188	
11:30-12:30	5	31	3	39	7	25	21	53	92	19	12	9	40	7	5	4	16	96	148	
12:30-13:30	7	38	5	50	6	22	24	52	102	37	8	5	50	4	7	5	16	66	168	
13:30-14:30	5	13	2	20	4	24	31	59	79	20	13	4	37	2	10	2	14	51	130	
16:00-17:00	6	20	1	27	5	17	36	58	85	40	17	6	63	5	10	6	21	84	169	
17:00-18:00	8	15	4	27	5	20	32	57	84	34	25	9	68	0	8	4	12	80	164	
8.0 HR TOTAL	46	201	21	268	42	198	254	494	762	270	120	48	438	38	85	38	161	599	1361	

Heavy Vehicles are vehicles having one rear axle with four or more wheels, or having two or more rear axles. These vehicles include most O.C. Transpo, school and inter-city buses. Further, they ARE included in the Turning Movement Count Summary.

Approved by: DT

Printed on: 13/02/2014

Bicycle Volume Summary Sheet - Hourly Volumes

MITCH OWENS RD and BANK ST
(ULRS Listing RR- 8 & BANK ST)

Survey Date: Monday 20 August 2012

Conditions: dry

Start Time: 0700

Time Period	NORTHBOUND APPROACH ON BANK ST		SOUTHBOUND APPROACH ON BANK ST		STREET TOTAL		EASTBOUND APPROACH ON RR- 8		WESTBOUND APPROACH ON RR- 8		STREET TOTAL		GRAND TOTAL	
	BANK ST	RR- 8	BANK ST	RR- 8	BANK ST	RR- 8	BANK ST	RR- 8	BANK ST	RR- 8	BANK ST	RR- 8	BANK ST	RR- 8
07:00-08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00-09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00-10:00	0	0	0	1	0	1	0	0	0	0	0	0	0	1
11:30-12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30-13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00-16:00	0	0	0	1	0	1	0	0	0	0	0	0	0	1
16:00-17:00	0	0	0	1	0	1	0	0	0	0	0	0	0	1
17:00-18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.0 HR TOTAL	0	0	0	3	0	3	0	0	0	0	0	0	0	3

Note: These volumes consists of bicycles only (no mopeds or motorcycles) and ARE NOT included in the Turning Movement Count Summary.

Approved by: DT

Printed on: 13/02/2014



MITCH OWENS RD and BANK ST
(Hwy 1 and RR-1 & HWY-31)

AAADT Factor
Monday to May 14

Total Observed U-Turns
Northbound: 0
Southbound: 0
Eastbound: 0
Westbound: 0

Survey Date: Monday 17 May 2010
Conditions: dry
Start Time: 0700

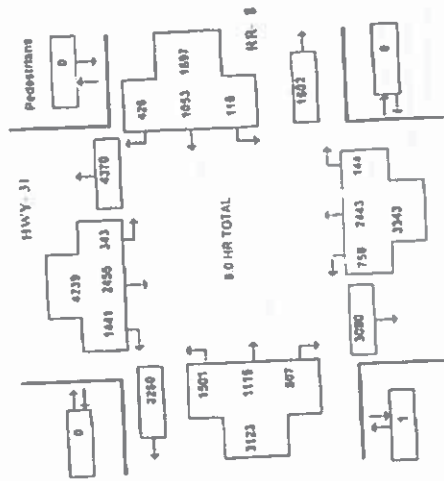


MITCH OWENS RD and BANK ST
(Hwy 1 and RR-1 & HWY-31)

AAADT Factor
Monday to May 14

Total Observed U-Turns
Northbound: 0
Southbound: 0
Eastbound: 0
Westbound: 0

Survey Date: Monday 17 May 2010
Conditions: dry
Start Time: 0700



Refer to Summary
Pages for Survey
Hours.

FEB-02-2012 11:53

TRAFFIC AND PARKING OPS

613 560 6059

P.04



Public Works and Services Department

Vehicular Turning Movements - Summary

MITCH OWENS RD and BANK ST

(101 HS, 1 Lane RR, 4 & HWY, 1)

Survey Date: Monday 17 May 2010
 Conditions: dry
 Start Time: 0700

Total Observed U-Turns
 Northbound: 0 Southbound: 0
 Eastbound: 0 Westbound: 0

AADT Factor
 Monday May 10
 1

Time Period	HWY-31								RR-8								SHR VTR GRAD					
	Passenger and				Scrubboard				Enchanted				Washboard				SHR		VTR		GRAD	
	SB	RT	LT	RT	SB	RT	LT	RT	SB	RT	LT	RT	SB	RT	LT	RT	SB	RT	LT	RT		
07:00-08:00	188	540	22	750	27	143	132	302	1052	328	140	59	527	12	208	123	343	870	1822			
08:00-09:00	154	408	17	577	13	151	130	284	871	277	137	48	482	9	135	57	202	684	1535			
09:00-10:00	72	277	13	362	16	138	141	285	637	165	119	41	338	14	101	53	188	524	1181			
11:00-12:00	65	223	14	302	32	219	115	386	668	135	66	42	238	9	84	44	137	375	1043			
12:00-13:00	60	248	12	320	37	239	117	393	713	152	77	42	288	11	103	38	149	404	1117			
15:00-16:00	79	249	28	356	49	457	241	747	1182	155	153	75	384	11	103	38	149	404	1117			
16:00-17:00	89	269	22	380	73	572	267	912	1272	143	235	102	480	26	150	35	211	601	1863			
17:00-18:00	68	231	16	316	96	538	256	930	1248	121	165	58	407	26	185	38	232	658	1845			
8.0 HR TOTAL	756	2443	144	3343	343	2455	1441	4238	7382	1501	1115	507	3723	118	1033	426	1837	4720	12102			

1.0M 12 HR TOTAL: 1050 3395 200 4845 476 3412 2002 5890 10535 2056 1548 704 4339 164 1463 592 2219 6358 17093

Note: These values are calculated by multiplying the totals by the appropriate expansion factor

AVG 12 HR TOTAL: 1050 3395 200 4845 476 3412 2002 5890 10535 2056 1548 704 4339 164 1463 592 2219 6358 17093

Note: These volumes are calculated by multiplying the Equivalency 12 hr totals by the AADT factor

AVG 24 HR TOTAL: 1375 4447 262 6084 673 4465 2622 7714 13788 2732 2859 822 5883 214 1916 775 2903 8588 22280

Note: These volumes were calculated by multiplying the Average Daily 12 hr totals by 1.31

AM TOTAL (7:00-17:00)	342	946	39	1327	40	284	262	586	1023	655	372	107	989	21	344	160	548	1524	3457
PM TOTAL (15:00-17:00)	156	515	40	711	153	1103	577	1893	2544	288	408	78	854	44	301	73	418	1272	3816

FEB-02-2012 11:53

TRAFFIC AND PARKING OPS

613 560 6059

P.05



Public Works and Services Department

Vehicular Turning Movements (15 Min. Volumes)

MITCH OWENS RD and BANK ST

(101 HS, 1 Lane RR, 4 & HWY, 1)

Survey Date: Monday 17 May 2010
 Conditions: dry
 Start Time: 0700

Total Observed U-Turns
 Northbound: 0 Southbound: 0
 Eastbound: 0 Westbound: 0

AADT Factor
 Monday May 10
 1

Time Period	HWY-31				Eastbound				Westbound				RR-8						
	Northbound		Southbound		NTH	STH	Eastbound		NTH	STH	Westbound		NTH	STH	GRADU				
	L	R	L	R			L	R			L	R			L	R			
07:00-07:15	43	137	8	188	7	25	36	68	256	81	28	12	121	0	59	50	109	230	486
07:15-07:30	49	153	3	185	12	38	31	81	286	85	48	17	156	7	44	29	80	230	496
07:30-07:45	52	137	0	185	2	47	37	88	281	73	30	9	114	2	51	16	71	185	486
07:45-08:00	44	133	5	182	6	33	28	67	249	67	34	31	142	3	54	26	83	225	474
08:00-08:15	63	158	4	185	1	25	43	69	224	76	43	8	128	2	38	13	81	179	413
08:15-08:30	34	104	4	147	3	42	25	70	212	82	34	18	132	2	37	17	58	188	400
08:30-08:45	36	114	3	183	8	42	33	83	238	58	35	14	105	3	27	19	49	154	390
08:45-09:00	31	60	6	117	1	42	29	72	189	83	25	9	97	2	36	6	46	143	332
09:00-09:15	19	76	2	97	4	41	40	85	182	67	36	12	115	4	34	17	55	170	352
09:15-09:30	10	64	4	78	3	44	35	82	160	52	20	9	81	2	25	17	44	123	285
09:30-09:45	17	67	6	90	6	26	35	89	159	38	26	5	89	6	16	10	32	101	260
09:45-10:00	26	70	1	97	3	25	31	89	158	38	37	15	91	2	26	9	37	128	284
11:00-11:15	27	54	4	85	6	44	23	73	158	28	19	12	59	1	26	11	38	97	255
11:15-12:00	10	45	4	59	11	58	21	88	147	38	11	5	52	1	18	5	26	77	224
12:00-12:15	14	73	3	90	9	55	41	105	195	36	14	7	57	5	23	11	39	96	291
12:15-12:30	14	51	3	88	6	64	30	100	188	30	22	18	70	2	16	17	35	106	273
12:30-12:45	14	66	2	87	7	64	35	104	188	48	21	8	75	2	23	11	36	111	299
12:45-13:00	19	58	3	90	10	65	33	108	188	33	17	9	58	3	10	13	26	84	272
13:00-13:15	9	63	5	74	9	56	31	96	170	38	17	11	64	3	27	8	38	102	272
13:15-13:30	18	64	2	84	11	54	18	83	187	38	22	14	72	3	23	9	35	107	274
15:00-15:15	14	52	0	75	7	105	43	85	239	44	33	15	83	4	22	5	31	124	354
15:15-15:30	18	72	5	96	10	102	54	168	281	40	30	16	88	1	22	10	33	119	380
15:30-15:45	30	59	7	98	15	100	67	182	278	45	43	31	118	2	28	6	38	132	430
15:45-16:00	17	66	7	98	17	150	77	244	334	27	53	12	89	4	31	14	49	138	472
16:00-16:15	20	73	9	104	11	142	73	228	330	29	70	18	116	2	34	9	45	183	493
16:15-16:30	20	68	6	94	20	135	57	212	306	37	48	37	122	4	36	9	49	171	477
16:30-16:45	19	57	4	80	22	167	63	252	332	40	61	24	126	3	38	8	59	184	518
16:45-17:00	10	65	7	82	20	128	74	222	304	37	56	22	115	7	42	9	58	173	477
17:00-17:15	20	54	1	75	34	165	64	283	388	36	44	26	108	7	58	11	76	182	550
17:15-17:30	20	87	3	90	14	118	72	202	292	17	39	7	63	5	34	7	46	109	491
17:30-17:45	12	56	7	76	25	120	75	220	295	36	53	29	117	4	43	7	64	171	488
17:45-18:00	17	64	5	76	23	135	57	215	291	33	52	36	121	10	53	13	76	197	488

Approved by: AW

Printed on: 02/02/2012



Public Works and Services Department
Pedestrian Volume Summary Sheet - Hourly Volumes
MITCH OWENS RD and BANK ST
 (Mits Owens Rd. & Hwy-31)

Case ID: 1470

Start Time: 0700

Survey Date: Monday 17 May 2010

Conditions: dry

Time Period	CROSSING HWY-31 NB APPROACH	CROSSING HWY-31 SB APPROACH	CROSSING HWY-31 WB APPROACH	CROSSING HWY-31 EB APPROACH	STREET TOTAL	GRAND TOTAL
07:00-08:00	0	0	0	0	0	0
08:00-09:00	0	0	0	0	0	0
09:00-10:00	0	0	0	0	0	0
10:00-11:00	0	0	0	0	0	0
11:00-12:00	0	0	0	0	0	0
12:00-13:00	0	0	0	0	0	0
13:00-14:00	0	0	0	0	0	0
14:00-15:00	0	0	0	0	0	0
15:00-16:00	0	0	0	0	0	0
16:00-17:00	0	0	0	0	0	0
17:00-18:00	0	0	0	0	0	0
8.0 HR TOTAL	0	0	0	0	0	0

PEAK PERIOD SUMMARIES

AM PEAK PERIOD (7:00-9:00)	OFF PEAK PERIOD (11:30-13:30)	PM PEAK PERIOD (15:30-17:30)
07:00-07:15	0	0
07:15-07:30	0	0
07:30-07:45	0	0
07:45-08:00	0	0
08:00-08:15	0	0
08:15-08:30	0	0
08:30-08:45	0	0
08:45-09:00	0	0
TOTALS	0	0
11:30-11:45	0	0
11:45-12:00	0	0
12:00-12:15	0	0
12:15-12:30	0	0
12:30-12:45	0	0
12:45-13:00	0	0
13:00-13:15	0	0
13:15-13:30	0	0
TOTALS	0	0
15:30-15:45	0	0
15:45-16:00	0	0
16:00-16:15	0	0
16:15-16:30	0	0
16:30-16:45	0	0
16:45-17:00	0	0
17:00-17:15	0	0
17:15-17:30	0	0
TOTALS	0	0

Approved by: AW

Printed on: 02/02/2012



Public Works and Services Department
Pedestrian Volume Summary Sheet - Hourly Volumes
MITCH OWENS RD and BANK ST
 (Mits Owens Rd. & Hwy-31)

Case ID: 2120

Start Time: 0700

Survey Date: Monday 17 May 2010

Conditions: dry



Time Period	HWY-31				Eastbound				Westbound				NB SR GRAND					
	NB		SB		SB		NB		NB		WB		WB		SR GRAND			
	Vol	Acc	Vol	Acc	Vol	Acc	Vol	Acc	Vol	Acc	Vol	Acc	Vol	Acc	Vol	Acc		
07:00-08:00	12	35	2	49	5	25	38	117	34	6	5	46	3	16	12	41	86	203
08:00-09:00	9	32	1	42	6	32	38	118	42	17	6	65	1	26	9	26	91	209
09:00-10:00	8	35	2	48	6	33	40	126	37	16	12	85	5	20	13	38	103	228
10:00-11:00	10	27	2	39	9	23	29	81	100	37	8	51	3	13	4	21	27	78
11:00-12:00	10	27	2	39	6	17	26	49	113	27	5	38	2	14	12	28	67	160
12:00-13:00	10	51	3	64	6	17	26	49	113	27	5	38	2	14	12	28	67	160
13:00-14:00	4	24	2	38	7	25	51	83	113	50	14	5	89	3	11	7	21	90
14:00-15:00	6	36	3	47	4	36	37	77	124	29	28	4	62	5	8	3	17	78
15:00-16:00	4	25	2	31	3	24	29	58	87	18	17	8	42	2	21	3	26	68
16:00-17:00	6	36	3	47	4	36	37	77	124	29	28	4	62	5	8	3	17	78
17:00-18:00	6	36	3	47	4	36	37	77	124	29	28	4	62	5	8	3	17	78
8.0 HR TOTAL	64	267	17	348	46	215	288	549	857	275	113	49	437	24	130	70	224	661

Heavy Vehicle: see vehicles making one rear axle with four or more wheels, or having four or more rear axles. These vehicles include heavy trucks, school buses, and motorhomes. For the HWY-31, included in the Turn of Movement Count summary.

Approved by: AW

Printed on: 02/02/2012

Bank @ Mitch Owens

Saturday February 11/2012

Start Time	BANK Southbound				MITCH OWENS Westbound				BANK Northbound				MITCH OWENS Eastbound			
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
01:30 PM	28	47	15	0	6	15	6	0	1	72	13	0	8	16	22	0
01:45 PM	22	72	9	0	7	19	2	0	2	52	25	0	13	22	27	0
02:00 PM	31	55	10	0	9	19	0	0	0	51	13	0	20	20	22	0
02:15 PM	28	80	14	0	7	11	2	0	1	53	23	0	12	23	24	0
02:30 PM	27	71	13	0	10	20	1	0	3	52	15	0	20	10	24	0
02:45 PM	31	53	13	0	11	14	4	0	2	41	11	0	20	15	20	0
03:00 PM	26	65	13	0	12	10	2	0	5	52	13	0	14	22	19	0
03:15 PM	27	60	7	0	6	22	3	0	2	54	13	0	19	18	17	0
Heavy Vehicles																
01:30 PM	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0
01:45 PM	3	3	0	0	0	1	0	0	0	0	0	0	1	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	2	1	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
02:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0

1049
1066
1029
1032
1002

15
13
8
9
8

Peak Hour

Start Time	BANK Southbound				MITCH OWENS Westbound				BANK Northbound				MITCH OWENS Eastbound			
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
1:45 PM	108	278	46	0	33	69	5	0	6	208	76	0	65	75	97	0
HV %	3%	1%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	2%	3%	2%	0%

1066

Appendix B – Detailed Intersection Analysis Worksheets

Existing Conditions Without Improvements

Lanes, Volumes, Timings
3: Bank Street & Mitch Owens Road

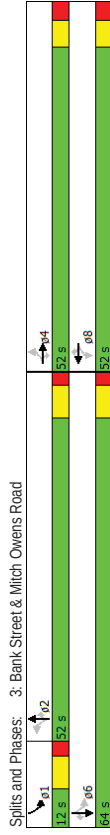
Lanes, Volumes, Timings
3: Bank Street & Mitch Owens Road

Lanes, Volumes, Timings
3: Bank Street & Mitch Owens Road

Lanes, Volumes, Timings
3: Bank Street & Mitch Owens Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	297	133	61	15	121	46	131	524	12	13	105	107
Volume (vph)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Ideal Flow (vphpl)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	0.850	0.850	0.995	0.995	0.995	0.950	0.850	0.850	0.950	0.850	0.850
Ped Bike Factor	0.967	0.1630	0.1334	0	0.1651	0.1419	0.1616	0.1717	0.1238	0.1320	0.1640	0.1218
Flt Protected	0.701	0.919	0.684	0.213	0.919	0.684	0.213	0.919	0.684	0.213	0.919	0.684
Satd. Flow (prot)	0	1178	1334	0	1525	1419	1163	1717	1238	296	1640	1218
Flt Permitted	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Satd. Flow (perm)	60	178.9	10.7	2	10.6	60	117.4	60	95	115.2	60	116
Right Turn on Red	10.7	10.7	10.6	2	10.6	60	117.4	60	95	115.2	60	116
Satd. Flow (RTOR)	60	178.9	10.7	2	10.6	60	117.4	60	95	115.2	60	116
Link Speed (k/h)	10.7	10.7	10.6	2	10.6	60	117.4	60	95	115.2	60	116
Link Distance (m)	10.7	10.7	10.6	2	10.6	60	117.4	60	95	115.2	60	116
Travel Time (s)	10.7	10.7	10.6	2	10.6	60	117.4	60	95	115.2	60	116
Conf. Peds. (#/hr)	2	2	2	2	2	2	2	2	2	2	2	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	8%	8%	16%	7%	10%	9%	7%	6%	25%	31%	11%	27%
Adj. Flow (vph)	323	145	66	16	132	50	142	570	13	14	114	116
Shared Lane Traffic (%)	0	468	66	0	148	50	142	570	13	14	114	116
Lane Group Flow (vph)	No	No	No	No	No	No	No	No	No	No	No	No
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Link Offset(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crosswalk Width(m)	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Two way Left Turn Lane	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Headway Factor	24	14	24	14	24	14	24	14	24	14	24	14
Turning Speed (k/h)	1	2	1	1	2	1	1	2	1	1	2	1
Number of Detectors	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Detector Template	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Leading Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 1 Channel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7
Detector 2 Size(m)	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Detector 2 Type	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 2 Channel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Extend (s)	Perm	NA	Perm	NA	Perm	NA	Perm	pm-pt	NA	Perm	NA	Perm
Turn Type	4	4	4	8	8	8	2	2	2	6	6	6
Permitted Phases	4	4	4	8	8	8	2	2	2	1	6	6
Detector Phase	4	4	4	8	8	8	2	2	2	1	6	6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Initial (s)	29.5	29.5	29.5	29.5	29.5	29.5	24.6	24.6	24.6	10.6	24.6	24.6
Minimum Split (s)	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	12.0	64.0	64.0
Total Split (s)	44.8%	44.8%	44.8%	44.8%	44.8%	44.8%	44.8%	44.8%	44.8%	10.3%	55.2%	55.2%
Total Split (%)	45.5	45.5	45.5	45.5	45.5	45.5	45.4	45.4	45.4	5.4	57.4	57.4
Maximum Green (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
Yellow Time (s)	2.8	2.8	2.8	2.8	2.8	2.8	2.0	2.0	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead-Lag Optimize?	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	None	None	None	None	None	None	Max	Max	Max	None	Max	Max
Recall Mode	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Walk Time (s)	16.0	16.0	16.0	16.0	16.0	16.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Calls (#/hr)	45.5	45.5	45.5	45.5	45.5	45.5	52.6	52.6	52.6	57.4	57.4	57.4
Act Effct Green (s)	0.39	0.39	0.39	0.39	0.39	0.39	0.45	0.45	0.45	0.49	0.49	0.49
Actuated g/C Ratio	1.01	1.01	1.01	1.01	1.01	1.01	0.27	0.27	0.27	0.02	0.14	0.18
v/c Ratio	81.2	2.3	25.2	0.7	23.2	34.3	0.1	15.8	16.5	3.5	3.5	3.5
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	81.2	2.3	25.2	0.7	23.2	34.3	0.1	15.8	16.5	3.5	3.5	3.5
Total Delay	81.2	2.3	25.2	0.7	23.2	34.3	0.1	15.8	16.5	3.5	3.5	3.5
LOS	F	A	C	C	A	C	C	A	B	B	A	A
Approach Delay	71.4	19.0	31.5	C	B	C	C	B	B	C	B	B
Approach LOS	E	B	C	B	C	C	C	B	B	C	B	B
Intersection Summary	Other											
Area Type:	Cycle Length: 116											
Actuated Cycle Length:	116											
Natural Cycle:	90											
Control Type:	Semi Act-Uncoordinated											
Maximum v/c Ratio:	1.01											
Intersection Signal Delay:	39.5											
Intersection Capacity Utilization:	77.8%											
Analysis Period (min):	15											



Queues
3: Bank Street & Mitch Owens Road

HCM Signalized Intersection Capacity Analysis
3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Existing AM

Bank Street @ Mitch Owens
Existing AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	468	66	148	50	148	50	142	570	13	14	114	116
v/c Ratio	1.01	0.11	0.25	0.08	0.27	0.73	0.02	0.73	0.02	0.07	0.14	0.18
Control Delay	81.2	2.3	25.2	0.7	23.2	34.3	0.1	15.8	0.1	15.8	16.5	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.2	2.3	25.2	0.7	23.2	34.3	0.1	15.8	0.1	15.8	16.5	3.5
Queue Length 50th (m)	~108.0	0.0	22.3	0.0	18.0	94.9	0.0	1.6	13.6	0.0	0.0	0.0
Queue Length 95th (m)	#174.1	4.2	37.5	1.1	38.3	#176.9	0.0	4.9	24.0	9.3	0.0	0.0
Internal Link Dist (m)	154.9		152.8			93.4					91.2	
Turn Bay Length (m)												
Base Capacity (vph)	462	581	588	614	527	778	613	194	811	661		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.11	0.25	0.08	0.27	0.73	0.02	0.73	0.02	0.07	0.14	0.18

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	297	133	61	15	121	46	131	524	12	13	105	107
Volume (vph)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Ideal Flow (vphpl)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fibp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fibp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fit Protected	0.97	1.00	0.99	1.00	0.99	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1624	1334	1650	1419	1616	1717	1238	1320	1640	1218		
Fit Permitted	0.70	1.00	0.92	1.00	0.68	1.00	1.00	0.21	1.00	1.00		
Satd. Flow (perm)	1179	1334	1524	1419	1163	1717	1238	295	1640	1218		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	323	145	66	16	132	50	142	570	13	14	114	116
RTOR Reduction (vph)	0	0	41	0	31	0	0	7	0	0	0	57
Lane Group Flow (vph)	0	468	25	0	148	19	142	570	6	14	114	59
Confli. Peds. (#/hr)	2			2								
Heavy Vehicles (%)	8%	8%	16%	7%	10%	9%	7%	6%	25%	31%	11%	27%
Turn Type	Perm	NA	Perm	NA	Perm	Perm	Perm	Perm	pm-pt	NA	Perm	Perm
Protected Phases	4	4		8	8	2	2	1	6			
Permitted Phases	4	4	8	8	8	2	2	6				
Actuated Green, G (s)	45.5	45.5	45.5	45.5	45.5	52.6	52.6	61.4	61.4	61.4	61.4	61.4
Effective Green, g (s)	45.5	45.5	45.5	45.5	45.5	52.6	52.6	61.4	61.4	61.4	61.4	61.4
Actuated g/C Ratio	0.38	0.38	0.38	0.38	0.38	0.44	0.44	0.51	0.51	0.51	0.51	0.51
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	447	505	577	538	509	752	542	169	839	623		
v/s Ratio Prot	c0.40	0.02	0.10	0.01	0.12	c0.33	0.00	c0.07				
v/s Ratio Perm	1.05	0.05	0.26	0.04	0.28	0.76	0.01	0.08	0.14	0.10		
Uniform Delay, d1	37.2	23.6	25.6	23.4	21.6	28.3	19.0	18.6	15.4	15.0		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	55.4	0.0	0.2	0.0	1.4	7.0	0.0	0.2	0.3	0.3		
Delay (s)	92.6	23.6	25.9	23.5	22.9	35.4	19.1	18.8	15.7	15.3		
Level of Service	F	C	C	C	C	D	B	B	B	B		
Approach Delay (s)	84.1		25.3			32.7		15.7				
Approach LOS	F		C			C		B				

Intersection Summary	
HCM 2000 Control Delay	45.5
HCM 2000 Volume to Capacity ratio	0.88
Actuated Cycle Length (s)	120.0
Intersection Capacity Utilization	77.8%
Analysis Period (min)	15
c. Critical Lane Group	

Lanes, Volumes, Timings
3: Bank Street & Mitch Owens Road

Lanes, Volumes, Timings
3: Bank Street & Mitch Owens Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	95	228	54	3	167	36	48	244	11	29	679	177
Volume (vph)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Ideal Flow (vphpl)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850
Flt Protected	0.986	0.986	0.986	0.986	0.986	0.986	0.986	0.986	0.986	0.986	0.986	0.986
Satd. Flow (prot)	0	1617	1459	0	1723	1547	1631	1701	1419	1729	1750	1459
Flt Permitted	0.811	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994
Satd. Flow (perm)	0	1329	1459	0	1724	1547	1631	1701	1419	1729	1750	1459
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Satd. Flow (RTOR)	122	122	122	122	122	122	122	122	122	122	122	122
Link Speed (k/h)	60	178.9	178.9	60	178.9	178.9	178.9	178.9	60	178.9	178.9	178.9
Link Distance (m)	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7
Travel Time (s)	2	2	2	2	2	2	2	2	2	2	2	2
Conf. Peds. (#/hr)	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Peak Hour Factor	23%	6%	6%	0%	5%	0%	6%	7%	9%	0%	4%	6%
Heavy Vehicles (%)	103	248	59	3	182	39	52	265	12	32	738	192
Adj. Flow (vph)	0	351	59	0	185	39	52	265	12	32	738	192
Shared Lane Traffic (%)	No	No	No	No	No	No	No	No	No	No	No	No
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Link Offset(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crosswalk Width(m)	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Two way Left Turn Lane	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Headway Factor	24	14	24	14	24	14	24	14	24	14	24	14
Turning Speed (k/h)	1	2	1	1	2	1	1	2	1	1	2	1
Number of Detectors	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Detector Template	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Leading Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 1 Channel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7
Detector 2 Size(m)	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Detector 2 Type	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 2 Channel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Extend (s)	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	pm-pt	NA	Perm
Turn Type	4	4	4	8	8	4	8	8	2	2	6	6
Protected Phases	4	4	4	8	8	8	8	8	2	2	6	6
Permitted Phases	4	4	4	8	8	8	8	8	2	2	6	6
Detector Phase	4	4	4	8	8	8	8	8	2	2	6	6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Initial (s)	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5
Minimum Split (s)	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0
Total Split (s)	40.7%	40.7%	40.7%	40.7%	40.7%	40.7%	40.7%	40.7%	40.7%	40.7%	40.7%	40.7%
Total Split (%)	30.5	30.5	30.5	30.5	30.5	30.5	30.4	30.4	30.4	30.4	30.4	30.4
Maximum Green (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Yellow Time (s)	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead-Lag Optimize?	Vehicle Extension (s)	Recall Mode	Walk Time (s)	Flash Dont Walk (s)	Pedestrian Calls (#/hr)	Act Effct Green (s)	Actuated g/C Ratio	v/c Ratio	Control Delay	Queue Delay	Total Delay	LOS
Vehicle Extension (s)	None	None	None	None	None	None	None	None	None	None	None	None
Recall Mode	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Walk Time (s)	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Flash Dont Walk (s)	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Calls (#/hr)	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
Act Effct Green (s)	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Actuated g/C Ratio	0.88	0.11	0.36	0.07	0.23	0.34	0.02	0.06	0.77	0.22	0.22	0.22
v/c Ratio	53.3	0.4	25.6	0.2	22.7	19.8	0.0	10.7	23.3	2.4	2.4	2.4
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	53.3	0.4	25.6	0.2	22.7	19.8	0.0	10.7	23.3	2.4	2.4	2.4
Total Delay	45.7	21.2	19.5	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7
LOS	D	A	C	A	C	B	A	B	C	A	B	C
Approach Delay	D	C	B	A	C	B	A	B	C	A	B	C
Approach LOS	D	C	B	A	C	B	A	B	C	A	B	C
Intersection Summary	Area Type: Other	Cycle Length: 91	Actuated Cycle Length: 86.7	Natural Cycle: 70	Control Type: Semi Act/Uncoordinated	Maximum v/c Ratio: 0.88	Intersection Signal Delay: 24.9	Intersection Capacity Utilization 86.1%	ICU Level of Service E	Analysis Period (min) 15		
Splits and Phases:	3: Bank Street & Mitch Owens Road											
	g1	g2	g3	g4	g5	g6	g7	g8	g9	g10	g11	g12
	17 s	37 s	37 s	37 s	37 s	37 s	37 s	37 s	37 s	37 s	37 s	37 s
	54 s	37 s	37 s	37 s	37 s	37 s	37 s	37 s	37 s	37 s	37 s	37 s

Queues

3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Existing PM

	EBT	EBR	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group	EBT	EBR	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	351	59	185	39	52	265	12	32	738
v/c Ratio	0.88	0.11	0.36	0.07	0.23	0.34	0.02	0.06	0.77
Control Delay	53.3	0.4	25.6	0.2	22.7	19.8	0.0	10.7	23.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.3	0.4	25.6	0.2	22.7	19.8	0.0	10.7	23.3
Queue Length 50th (m)	55.0	0.0	23.8	0.0	6.0	32.3	0.0	2.5	96.8
Queue Length 95th (m)	#98.6	0.3	40.6	0.0	16.2	55.2	0.0	6.8	#155.1
Internal Link Dist (m)	154.9		152.8		93.4				91.2

Turn Bay Length (m)	469	594	608	625	227	782	717	587	960
Base Capacity (vph)	0	0	0	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.10	0.30	0.06	0.23	0.34	0.02	0.05	0.77

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

Bank Street @ Mitch Owens
Existing PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	95	228	54	3	167	36	48	244	11	29	679	177
Volume (vph)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Ideal Flow (vphpl)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fit Protected	0.99	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1615	1459	1733	1547	1631	1701	1419	1729	1750	1459	1459	1459
Fit Permitted	0.81	1.00	0.99	1.00	0.29	1.00	0.49	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)	1328	1459	1724	1547	494	1701	1419	884	1750	1459	1459	1459
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	103	248	59	3	182	39	52	285	12	32	738	182
RTOR Reduction (vph)	0	0	42	0	0	28	0	0	7	0	0	84
Lane Group Flow (vph)	0	351	17	0	185	11	52	265	5	32	738	108
Conf. Ped. (#/hr)	2			2								
Heavy Vehicles (%)	23%	6%	6%	0%	5%	0%	6%	7%	9%	0%	4%	6%
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	4	4		8	8		2		1		6	
Permitted Phases		4	8	8	8	2		2		6		6
Actuated Green, G (s)	26.0	26.0	26.0	26.0	26.0	39.8	39.8	39.8	50.3	50.3	50.3	50.3
Effective Green, g (s)	26.0	26.0	26.0	26.0	26.0	39.8	39.8	39.8	50.3	50.3	50.3	50.3
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29	0.45	0.45	0.45	0.56	0.56	0.56	0.56
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	386	424		501	449	219	757	631	534	984	820	
v/s Ratio Prot						0.16				0.00	0.42	
v/s Ratio Perm	0.26	0.01	0.11	0.01	0.11	0.11	0.00	0.03	0.07			
v/c Ratio	0.91	0.04	0.37	0.03	0.24	0.35	0.01	0.06	0.75	0.13		
Uniform Delay, d1	30.6	22.7	25.2	22.6	15.4	16.3	13.8	9.1	14.8	9.2		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	24.5	0.0	0.5	0.0	2.5	1.3	0.0	0.0	5.2	0.3		
Delay (s)	55.1	22.8	25.6	22.7	17.9	17.6	13.8	9.2	20.0	9.6		
Level of Service	E	C	C	C	B	B	B	A	C	A		
Approach Delay (s)	50.4		25.1		17.5		17.6					
Approach LOS	D		C		B		B					

Intersection Summary												
HCM 2000 Control Delay	25.4											
HCM 2000 Volume to Capacity ratio	0.88											
Actuated Cycle Length (s)	89.4											
Intersection Capacity Utilization	86.1%											
Analysis Period (min)	15											
c. Critical Lane Group												

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IV

Synchro 8 Report

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Synchro 8 Report

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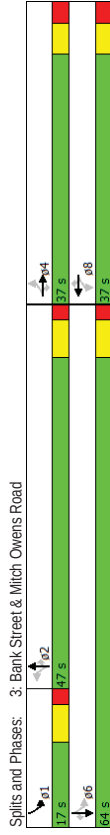
Lanes, Volumes, Timings

3: Bank Street & Mitch Owens Road												Bank Street @ Mitch Owens												Existing SAT													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR				

Lane Configurations	97	75	65	5	69	33	76	208	6	46	278	108
Volume (vph)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Ideal Flow (vphpl)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850
Fit Protected	0.973	0.997	0.997	0.997	0.997	0.997	0.997	0.997	0.997	0.997	0.997	0.997
Satd. Flow (prot)	0	1748	1547	0	1765	1547	1729	1820	1517	1729	1820	1547
Flt Permitted	0.782	0.976	0.976	0.976	0.976	0.976	0.976	0.976	0.976	0.976	0.976	0.976
Satd. Flow (perm)	0	1402	1547	0	1727	1547	1048	1820	1517	996	1820	1547
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Satd. Flow (RTOR)	110	110	110	110	110	110	109	109	109	109	117	117
Link Speed (k/h)	60	60	60	60	60	60	60	60	60	60	60	60
Link Distance (m)	178.9	176.8	176.8	176.8	176.8	176.8	117.4	117.4	117.4	117.4	115.2	115.2
Travel Time (s)	10.7	10.6	10.6	10.6	10.6	10.6	7.0	7.0	7.0	7.0	6.9	6.9
Confl. Peds. (#/hr)	2	2	2	2	2	2	2	2	2	2	2	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	0%	0%	2%	0%	0%	0%
Adj. Flow (vph)	105	82	71	5	75	36	83	226	7	50	302	117
Shared Lane Traffic (%)	0	187	71	0	80	36	83	226	7	50	302	117
Lane Group Flow (vph)	No	No	No	No	No	No	No	No	No	No	No	No
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0	0.0	0.0	0.0	0.0	0.0	3.7	3.7	3.7	3.7	3.7	3.7
Link Offset(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crosswalk Width(m)	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Two way Left Turn Lane	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Headway Factor	24	14	24	14	24	14	24	14	24	14	24	14
Turning Speed (k/h)	1	2	1	1	2	1	1	2	1	1	2	1
Number of Detectors	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Detector Template	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Leading Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Size(m)	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 1 Type	Detector 1 Channel	Detector 1 Extend (s)	Detector 1 Queue (s)	Detector 1 Delay (s)	Detector 2 Position(m)	Detector 2 Size(m)	Detector 2 Type	Detector 2 Channel	Detector 2 Extend (s)	Turn Type	Protected Phases	Permitted Phases
Detector 1 Channel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7
Detector 2 Size(m)	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Detector 2 Type	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 2 Channel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Extend (s)	Perm	NA	Perm	NA	Perm	Perm	Perm	pm-pt	NA	Perm	Perm	Perm
Turn Type	4	4	8	8	8	8	2	2	2	6	6	6
Protected Phases	4	4	4	8	8	8	2	2	2	1	6	6
Permitted Phases	4	4	4	8	8	8	2	2	2	1	6	6
Detector Phase	4	4	4	8	8	8	2	2	2	1	6	6

Lanes, Volumes, Timings												Bank Street @ Mitch Owens												Existing SAT											
3: Bank Street & Mitch Owens Road																																			

Switch Phase	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Initial (s)	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5
Minimum Split (s)	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0
Total Split (s)	36.6%	36.6%	36.6%	36.6%	36.6%	36.6%	36.6%	36.6%	36.6%	36.6%	36.6%	36.6%
Total Split (%)	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5
Maximum Green (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Yellow Time (s)	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	None	None	None	None	None	None	None	None	None	None	None	None
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Act Effct Green (s)	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0
Actuated g/C Ratio	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
v/c Ratio	0.70	0.19	0.24	0.09	0.14	0.22	0.01	0.07	0.25	0.11	0.07	0.11
Control Delay	47.7	3.1	31.2	0.5	13.4	12.8	0.0	6.8	7.6	1.8	0.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.7	3.1	31.2	0.5	13.4	12.8	0.0	6.8	7.6	1.8	0.0	0.0
LOS	D	A	C	A	B	B	A	A	A	A	A	A
Approach Delay	35.4	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6
Approach LOS	D	C	C	C	C	C	C	C	C	C	C	C
Intersection Summary	Other											
Area Type:	Other											
Cycle Length:	101											
Actuated Cycle Length:	89.5											
Natural Cycle:	65											
Control Type:	Semi Act-Uncoord											
Maximum v/c Ratio:	0.70											
Intersection Signal Delay:	15.9											
Intersection Capacity Utilization:	52.8%											
Analysis Period (min):	15											



Queues
3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Existing SAT

	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Group Flow (vph)	187	71	80	36	83	226	7	50	302	117	
v/c Ratio	0.70	0.19	0.24	0.09	0.14	0.22	0.01	0.07	0.25	0.11	
Control Delay	47.7	3.1	31.2	0.5	13.4	12.8	0.0	6.8	7.6	1.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	47.7	3.1	31.2	0.5	13.4	12.8	0.0	6.8	7.6	1.8	
Queue Length 50th (m)	29.4	0.0	11.4	0.0	7.0	20.0	0.0	2.6	18.2	0.0	
Queue Length 95th (m)	50.4	4.2	22.9	0.0	18.2	40.9	0.0	7.9	37.8	6.1	
Internal Link Dist (m)	154.9		152.8		93.4				91.2		
Turn Bay Length (m)											
Base Capacity (vph)	478	600	589	600	600	1043	915	745	1206	1065	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.39	0.12	0.14	0.06	0.14	0.22	0.01	0.07	0.25	0.11	
Intersection Summary											

HCM Signalized Intersection Capacity Analysis
3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Existing SAT

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	97	75	65	5	69	33	76	208	6	46	278	108
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fit Protected	0.97	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1744	1547	1764	1547	1729	1820	1517	1729	1820	1517	1729	1820
Fit Permitted	0.78	1.00	0.98	1.00	0.98	1.00	0.58	1.00	0.58	1.00	0.58	1.00
Satd. Flow (perm)	1401	1547	1727	1547	1727	1820	1517	1727	1820	1517	1727	1820
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	105	82	71	5	75	36	83	226	7	50	302	117
RTOR Reduction (vph)	0	0	58	0	0	29	0	0	0	3	0	0
Lane Group Flow (vph)	0	187	13	0	80	7	83	226	4	50	302	79
Conf. Ped. (#/hr)	2			2								
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	0%	0%	2%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	4	4	4	8	8	8	2	2	1	6	6	6
Permitted Phases	4	4	4	8	8	8	2	2	2	2	2	2
Actuated Green, G (s)	17.0	17.0	17.0	17.0	17.0	17.0	51.3	51.3	51.3	62.0	62.0	62.0
Effective Green, g (s)	17.0	17.0	17.0	17.0	17.0	17.0	51.3	51.3	51.3	62.0	62.0	62.0
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.18	0.18	0.56	0.56	0.56	0.67	0.67	0.67
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	258	285	318	285	318	285	983	1013	844	703	1225	1041
v/s Ratio Prot	c0.13	0.01	0.05	0.00	0.08	0.12	0.00	0.04	0.00	c0.17	0.05	0.05
v/s Ratio Perm	0.72	0.05	0.25	0.02	0.14	0.22	0.00	0.07	0.00	0.25	0.08	0.08
Uniform Delay, d1	35.3	30.9	32.1	30.8	9.8	10.3	9.1	5.3	5.9	5.2	5.2	5.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.7	0.1	0.4	0.0	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.1
Delay (s)	45.0	30.9	32.5	30.8	10.3	10.8	9.1	5.4	6.4	5.3	5.3	5.3
Level of Service	D	C	C	C	B	B	A	A	A	A	A	A
Approach Delay (s)	41.2		32.0		10.7					6.0		
Approach LOS	D		C		B					A		

Intersection Summary											
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service									
HCM 2000 Volume to Capacity ratio	0.38	B									
Actuated Cycle Length (s)	92.1	Sum of lost time (s)									
Intersection Capacity Utilization	52.8%	ICU Level of Service									
Analysis Period (min)	15	A									
c. Critical Lane Group											

Existing Conditions With Improvements

Lanes, Volumes, Timings
3: Bank Street & Mitch Owens Road

Lanes, Volumes, Timings
3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Existing AM - with improvements

Bank Street @ Mitch Owens
Existing AM - with improvements

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	297	133	61	15	121	46	131	524	12	13	105	107
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850
Fit	0.967	0.967	0.967	0.995	0.995	0.995	0.950	0.950	0.950	0.950	0.950	0.950
Satd. Flow (prot)	0	1630	1334	0	1651	1419	1616	1717	1238	1640	1218	1218
Fit Permitted	0.704	0.704	0.704	0.936	0.936	0.936	0.684	0.684	0.684	0.684	0.684	0.684
Satd. Flow (perm)	0	1183	1334	0	1553	1419	1163	1717	1238	1640	1218	1218
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Satd. Flow (RTOR)	66	66	66	50	50	50	33	33	33	33	33	33
Link Speed (k/h)	60	60	60	60	60	60	60	60	60	60	60	60
Link Distance (m)	178.9	178.9	178.9	176.8	176.8	176.8	117.4	117.4	117.4	115.2	115.2	115.2
Travel Time (s)	10.7	10.7	10.7	10.6	10.6	10.6	7.0	7.0	7.0	6.9	6.9	6.9
Confl. Peds. (#/hr)	2	2	2	2	2	2	2	2	2	2	2	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	8%	8%	16%	7%	10%	9%	7%	6%	25%	31%	11%	27%
Adj. Flow (vph)	323	145	66	16	132	50	142	570	13	14	114	116
Shared Lane Traffic (%)	0	468	66	0	148	50	142	570	13	14	114	116
Lane Group Flow (vph)	No	No	No	No	No	No	No	No	No	No	No	No
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0	0.0	0.0	0.0	0.0	0.0	3.7	3.7	3.7	3.7	3.7	3.7
Link Offset(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crosswalk Width(m)	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14	24	14	24	14	24	14	24	14	24	14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7
Detector 2 Size(m)	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Detector 2 Type	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	Perm
Protected Phases	4	4	4	8	8	8	2	2	2	6	6	6
Permitted Phases	4	4	4	8	8	8	2	2	2	6	6	6
Detector Phase	4	4	4	8	8	8	2	2	2	6	6	6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	29.5	29.5	29.5	29.5	29.5	29.5	24.6	24.6	24.6	24.6	24.6	24.6
Total Split (s)	71.0	71.0	71.0	71.0	71.0	71.0	45.0	45.0	45.0	45.0	45.0	45.0
Total Split (%)	61.2%	61.2%	61.2%	61.2%	61.2%	61.2%	38.8%	38.8%	38.8%	38.8%	38.8%	38.8%
Maximum Green (s)	64.5	64.5	64.5	64.5	64.5	64.5	38.4	38.4	38.4	38.4	38.4	38.4
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.8	2.8	2.8	2.8	2.8	2.8	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0	16.0	10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Act Effct Green (s)	41.9	41.9	41.9	41.9	41.9	41.9	39.2	39.2	39.2	39.2	39.2	39.2
Actuated g/C Ratio	0.44	0.44	0.44	0.44	0.44	0.44	0.41	0.41	0.41	0.41	0.41	0.41
v/c Ratio	0.89	0.10	0.21	0.08	0.29	0.80	0.02	0.10	0.17	0.20	0.17	0.20
Control Delay	43.6	3.6	15.7	3.8	24.7	37.6	2.1	26.2	22.4	5.9	5.9	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.6	3.6	15.7	3.8	24.7	37.6	2.1	26.2	22.4	5.9	5.9	5.9
LOS	D	A	B	A	C	D	A	C	C	A	C	A
Approach Delay	38.7	12.7					34.5			14.7		
Approach LOS	D	B					C			B		
Intersection Summary												
Area Type:	Other											
Cycle Length:	116											
Actuated Cycle Length:	94.5											
Natural Cycle:	90											
Control Type:	Semi Act-Uncoordinated											
Maximum v/c Ratio:	0.89											
Intersection Signal Delay:	30.4											
Intersection Capacity Utilization:	77.8%											
Analysis Period (min):	15											
Splits and Phases:	3: Bank Street & Mitch Owens Road											
	92	94	96	98	100	102	104	106	108	110	112	114
	45 s	45 s	45 s	45 s	45 s	45 s	45 s	45 s	45 s	45 s	45 s	45 s
	45 s	45 s	45 s	45 s	45 s	45 s	45 s	45 s	45 s	45 s	45 s	45 s

Queues

3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Existing AM - with improvements

	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	468	66	148	50	142	570	13	14	114
v/c Ratio	0.89	0.10	0.21	0.08	0.29	0.80	0.02	0.10	0.17
Control Delay	43.6	3.6	15.7	3.8	24.7	37.6	2.1	26.2	22.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.6	3.6	15.7	3.8	24.7	37.6	2.1	26.2	22.4
Queue Length 50th (m)	74.5	0.0	15.8	0.0	16.7	88.2	0.0	1.5	12.7
Queue Length 95th (m)	116.7	6.0	26.4	5.4	42.4	#201.5	1.2	7.5	32.7
Internal Link Dist (m)	154.9		152.8		93.4				91.2
Turn Bay Length (m)									
Base Capacity (vph)	823	949	1081	1003	482	711	532	134	680
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.07	0.14	0.05	0.29	0.80	0.02	0.10	0.17
Intersection Summary									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									

HCM Signalized Intersection Capacity Analysis

3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Existing AM - with improvements

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	297	133	61	15	121	46	131	524	12	13	105	107
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fit	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85
Fit Protected	0.97	1.00	0.99	1.00	0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1625	1334	1650	1419	1616	1717	1238	1320	1640	1218	1640	1218
Fit Permitted	0.70	1.00	0.94	1.00	0.68	1.00	1.00	0.23	1.00	1.00	0.23	1.00
Satd. Flow (perm)	1184	1334	1553	1419	1163	1717	1238	323	1640	1218	323	1640
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	323	145	66	16	132	50	142	570	13	14	114	116
RTOR Reduction (vph)	0	0	37	0	0	28	0	0	8	0	0	68
Lane Group Flow (vph)	0	468	29	0	148	22	142	570	5	14	114	48
Conf. Ped. (#/hr)	2		2									
Heavy Vehicles (%)	8%	8%	16%	7%	10%	9%	7%	6%	25%	31%	11%	27%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		8		2			6	6
Permitted Phases	4		4	8		8	2	2	2	2	6	6
Actuated Green, G (s)	42.0	42.0	42.0	42.0	42.0	39.2	39.2	39.2	39.2	39.2	39.2	39.2
Effective Green, g (s)	42.0	42.0	42.0	42.0	42.0	39.2	39.2	39.2	39.2	39.2	39.2	39.2
Actuated g/C Ratio	0.45	0.45	0.45	0.45	0.45	0.42	0.42	0.42	0.42	0.42	0.42	0.42
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	527	594	691	632	483	713	514	134	681	506	681	506
v/s Ratio Prot						c0.33					0.07	
v/s Ratio Perm	c0.40	0.02	0.10	0.02	0.12	0.00	0.04	0.00	0.04	0.04	0.04	0.04
v/c Ratio	0.89	0.05	0.21	0.04	0.29	0.80	0.01	0.10	0.17	0.10	0.17	0.10
Uniform Delay, d1	24.0	14.8	16.0	14.7	18.3	24.1	16.2	16.8	17.3	16.8	17.3	16.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	16.5	0.0	0.2	0.0	1.5	9.1	0.0	1.6	0.5	0.4	0.5	0.4
Delay (s)	40.5	14.9	16.2	14.8	19.9	33.2	16.2	18.4	17.8	17.1	17.8	17.1
Level of Service	D	B	B	B	B	C	B	B	B	B	B	B
Approach Delay (s)	37.3		15.8		30.3			17.5				
Approach LOS	D		B		C			B				B

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IV

Synchro 8 Report

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IV

Synchro 8 Report

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2015 Future Background Conditions

Lanes, Volumes, Timings
3: Bank Street & Mitch Owens Road

Lanes, Volumes, Timings
3: Bank Street & Mitch Owens Road

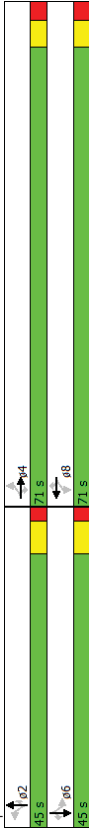
Bank Street @ Mitch Owens
Future Background 2015 AM

Bank Street @ Mitch Owens
Future Background 2015 AM

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	297	133	97	23	121	46	149	577	14	13
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.850	1.00	0.850	0.850	0.850	0.850	0.850	0.850	0.850
Fit	0.967	0.967	0.992	0.992	0.950	0.950	0.950	0.950	0.950	0.950
Flt Protected	0	1630	1334	0	1648	1419	1616	1717	1238	1640
Satd. Flow (prot)	0.706	0.706	0.903	0.903	0.638	0.638	0.638	0.638	0.638	0.638
Flt Permitted	0	1186	1334	0	1500	1419	1085	1717	1238	1640
Satd. Flow (perm)	0	1186	1334	0	1500	1419	1085	1717	1238	1640
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Satd. Flow (RTOR)	97	97	97	97	46	46	46	33	33	107
Link Speed (k/h)	60	60	60	60	60	60	60	60	60	60
Link Distance (m)	178.9	178.9	176.8	176.8	117.4	117.4	117.4	115.2	115.2	115.2
Travel Time (s)	10.7	10.7	10.6	10.6	7.0	7.0	7.0	6.9	6.9	6.9
Confl. Peds. (#/hr)	2	2	2	2	2	2	2	2	2	2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	8%	8%	16%	7%	10%	9%	7%	6%	25%	31%
Adj. Flow (vph)	297	133	97	23	121	46	149	577	14	13
Shared Lane Traffic (%)	0	430	97	0	144	46	149	577	14	13
Lane Group Flow (vph)	No	No	No	No	No	No	No	No	No	No
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Left	Left	Left	Left	Left
Median Width(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Link Offset(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crosswalk Width(m)	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Two way Left Turn Lane										
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14	24	14	24	14	24	14	24	14
Number of Detectors	1	2	1	1	2	1	2	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left
Leading Detector (m)	6.1	30.5	6.1	30.5	6.1	30.5	6.1	30.5	6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	1.8	6.1	1.8	6.1	1.8	6.1	1.8
Detector 1 Type	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 1 Channel										
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7
Detector 2 Size(m)	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Detector 2 Type	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 2 Channel										
Detector 2 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	4	4	8	8	2	2	2	2	6	6
Permitted Phases	4	4	8	8	2	2	2	2	6	6
Detector Phase	4	4	8	8	2	2	2	2	6	6

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	29.5	29.5	29.5	29.5	24.6	24.6	24.6	24.6	24.6	24.6
Total Split (s)	71.0	71.0	71.0	71.0	71.0	45.0	45.0	45.0	45.0	45.0
Total Split (%)	61.2%	61.2%	61.2%	61.2%	38.8%	38.8%	38.8%	38.8%	38.8%	38.8%
Maximum Green (s)	64.5	64.5	64.5	64.5	38.4	38.4	38.4	38.4	38.4	38.4
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.8	2.8	2.8	2.8	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag										
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	None	None
Flash Dont Walk (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0
Act Effct Green (s)	37.5	37.5	37.5	37.5	39.1	39.1	39.1	39.1	39.1	39.1
Actuated g/C Ratio	0.42	0.42	0.42	0.42	0.43	0.43	0.43	0.43	0.43	0.43
v/c Ratio	0.87	0.16	0.23	0.07	0.32	0.77	0.03	0.09	0.27	0.18
Control Delay	45.7	3.5	16.6	4.2	22.9	33.9	2.4	23.1	20.9	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.7	3.5	16.6	4.2	22.9	33.9	2.4	23.1	20.9	5.5
LOS	D	A	B	A	C	C	A	C	C	A
Approach Delay										
Approach LOS	D	D	B	B	C	C	B	B	B	B
Intersection Summary										
Area Type:	Other									
Cycle Length:	116									
Actuated Cycle Length:	90									
Natural Cycle:	80									
Control Type:	Semi Act-Uncoordinated									
Maximum v/c Ratio:	0.87									
Intersection Signal Delay:	28.5									
Intersection Capacity Utilization:	90.0%									
Analysis Period (min):	60									

Splits and Phases: 3: Bank Street & Mitch Owens Road



Queues

Queues
3: Bank Street & Mitch Owens Road
Bank Street @ Mitch Owens
Future Background 2015 AM

HCM Signalized Intersection Capacity Analysis 3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Future Background 2015 AM

[illegible]

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	297	133	97	23	121	46	149	577	14	13	190	107
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		6.5	6.5		6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	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	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97	1.00		0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1625	1334		1648	1419	1616	1717	1238	1320	1640	1218
Flt Permitted		0.71	1.00		0.90	1.00	0.64	1.00	1.00	0.25	1.00	1.00
Satd. Flow (perm)		1188	1334		1500	1419	1085	1717	1238	346	1640	1218
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
Adj. Flow (vph)	297	133	97	23	121	46	149	577	14	13	190	107
RTOR Reduction (vph)	0	0	56	0	0	27	0	0	8	0	0	60
Lane Group Flow (vph)		4	430	41	0	144	19	149	577	6	13	190
Conf. Peds. (#/hr)	2			2							47	
Heavy Vehicles (%)	8%	8%	16%	7%	10%	9%	7%	6%	25%	31%	11%	27%
Turn Type	Perm	NA	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	NA	Perm
Protected Phases		4		8	8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)		37.6	37.6		37.6	37.6	39.1	39.1	39.1	39.1	39.1	39.1
Effective Green, g (s)		37.6	37.6		37.6	37.6	39.1	39.1	39.1	39.1	39.1	39.1
Actuated g/C Ratio		0.42	0.42		0.42	0.42	0.44	0.44	0.44	0.44	0.44	0.44
Clearance Time (s)		6.5	6.5		6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		497	558		628	594	472	747	539	150	714	530
v/s Ratio Prot		c0.36	0.03		0.10	0.01	0.14	c0.34		0.04	0.12	
v/s Ratio Perm		0.87	0.07		0.23	0.03	0.32	0.77		0.01	0.09	
v/s Ratio		23.8	15.6		16.8	15.4	16.6	21.6	14.4	14.9	16.2	14.9
Uniform Delay, d1		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		16.9	0.1		0.2	0.0	1.8	8.0	0.0	1.1	0.9	0.3
Delay (s)		40.7	15.7		17.0	15.4	18.3	29.6	14.4	16.0	17.1	15.2
Level of Service	D	D	B		B	B	B	C	B	B	B	B
Approach Delay (s)		36.1			16.6			27.0			16.4	
Approach LOS	D				B			C			B	

Intersection Summary			
HCN 2000 Control Delay	26.7	HCN 2000 Level of Service	C
HCN 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	89.8	Sum of lost time (s)	13.1
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	60		
c Critical Lane Group			

Lanes, Volumes, Timings
3: Bank Street & Mitch Owens Road

Lanes, Volumes, Timings
3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens

Bank Street @ Mitch Owens

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	95	228	87	12	167	36	106	447	26	29	857	177
Volume (vph)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Ideal Flow (vphpl)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	0.850	0.850	0.997	0.997	0.950	0.950	0.850	0.850	0.950	0.850	0.850
Ped Bike Factor	0	1617	1459	0	1734	1547	1631	1701	1419	1729	1750	1459
Fit Protected	0.815	0.965	0.965	0.163	0.163	0.449	0.449					
Fit Permitted	0	1335	1459	0	1678	1547	280	1701	1419	817	1750	1459
Satd. Flow (perm)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Right Turn on Red	87	43	60	60	60	42	42	60	60	60	60	177
Satd. Flow (RTOR)												
Link Speed (k/h)	178.9	10.7	10.6	117.4	117.4	7.0	6.9					
Link Distance (m)	2	2	2	2	2	2	2	2	2	2	2	2
Travel Time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Confl. Peds. (#/hr)	23%	6%	6%	0%	5%	0%	6%	7%	9%	0%	4%	6%
Heavy Vehicles (%)	95	228	87	12	167	36	106	447	26	29	857	177
Adj. Flow (vph)	0	323	87	0	179	36	106	447	26	29	857	177
Shared Lane Traffic (%)	No	No	No	No	No	No	No	No	No	No	No	No
Lane Group Flow (vph)	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Enter Blocked Intersection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Link Offset(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crosswalk Width(m)	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14	24	14	24	14	24	14	24	14	24	14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7
Detector 2 Size(m)	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Detector 2 Type	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	4	4	4	8	8	2	2	2	2	6	6	6
Permitted Phases	4	4	4	8	8	8	8	2	2	6	6	6
Detector Phase	4	4	4	8	8	8	8	2	2	6	6	6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Initial (s)	29.5	29.5	29.5	29.5	29.5	29.5	24.6	24.6	24.6	24.6	24.6	24.6
Minimum Split (s)	33.0	33.0	33.0	33.0	33.0	33.0	58.0	58.0	58.0	58.0	58.0	58.0
Total Split (s)	36.3%	36.3%	36.3%	36.3%	36.3%	36.3%	63.7%	63.7%	63.7%	63.7%	63.7%	63.7%
Total Split (%)	26.5	26.5	26.5	26.5	26.5	26.5	51.4	51.4	51.4	51.4	51.4	51.4
Maximum Green (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
Yellow Time (s)	2.8	2.8	2.8	2.8	2.8	2.8	2.0	2.0	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Total Lost Time (s)												
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0	16.0	10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Act Effct Green (s)	24.1	24.1	24.1	24.1	24.1	24.1	51.5	51.5	51.5	51.5	51.5	51.5
Actuated g/C Ratio	0.27	0.27	0.27	0.27	0.27	0.27	0.58	0.58	0.58	0.58	0.58	0.58
v/c Ratio	0.89	0.19	0.39	0.08	0.65	0.45	0.03	0.06	0.84	0.19	0.19	0.19
Control Delay	66.9	6.8	29.0	6.9	38.8	13.0	1.7	9.4	26.7	2.1	2.1	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.9	6.8	29.0	6.9	38.8	13.0	1.7	9.4	26.7	2.1	2.1	2.1
LOS	E	A	C	A	D	B	A	A	C	A	C	A
Approach Delay	54.2	25.3	C				17.2			22.1		
Approach LOS	D	C					B			C		
Intersection Summary												
Area Type:	Other											
Cycle Length: 91												
Actuated Cycle Length: 88.7												
Natural Cycle: 90												
Control Type: Semi Act/Uncoord												
Maximum v/c Ratio: 0.89												
Intersection Signal Delay: 26.9												
Intersection Capacity Utilization 103.8%												
Analysis Period (min) 60												
Splits and Phases:	3: Bank Street & Mitch Owens Road											
	g2	g4	g6	g8	g10	g12	g14	g16	g18	g20	g22	g24
	58 s	58 s	58 s	58 s	58 s	58 s	58 s	58 s	58 s	58 s	58 s	58 s
	58 s	58 s	58 s	58 s	58 s	58 s	58 s	58 s	58 s	58 s	58 s	58 s

	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Group Flow (vph)	323	87	179	36	106	447	26	29	857	177	
v/c Ratio	0.89	0.19	0.39	0.08	0.65	0.45	0.03	0.06	0.84	0.19	
Control Delay	66.9	6.8	29.0	6.9	38.8	13.0	1.7	9.4	26.7	2.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	66.9	6.8	29.0	6.9	38.8	13.0	1.7	9.4	26.7	2.1	
Queue Length 50th (m)	52.6	0.0	24.8	0.0	12.1	43.1	0.0	2.1	119.3	0.0	
Queue Length 95th (m)	#115.6	12.9	48.3	7.1	#49.2	77.7	2.7	6.7	#244.7	10.8	
Internal Link Dist (m)	154.9		152.8			93.4				91.2	
Turn Bay Length (m)											
Base Capacity (vph)	399	497	501	492	162	986	840	474	1015	921	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.81	0.18	0.36	0.07	0.65	0.45	0.03	0.06	0.84	0.19	
Intersection Summary											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	95	228	87	12	167	36	106	447	26	29	857	177
Volume (vph)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Ideal Flow (vphpl)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fibp, ped/bikes	1.00	1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00	0.85	1.00	0.85
Fit	1.00	0.99	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95
Fit Protected	1614	1459	1733	1547	1631	1701	1419	1729	1750	1459	1459	1459
Satd. Flow (prot)	0.82	1.00	0.96	1.00	0.16	1.00	1.00	0.45	1.00	1.00	1.00	0.45
Fit Permitted	1335	1459	1678	1547	279	1701	1419	816	1750	1459	1459	1459
Satd. Flow (perm)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Peak-hour factor, PHF	95	228	87	12	167	36	106	447	26	29	857	177
Adj. Flow (vph)	0	63	0	0	26	0	11	0	0	74	0	0
RTOR Reduction (vph)	0	323	24	0	179	10	106	447	15	29	857	103
Lane Group Flow (vph)	2			2								
Conf. Ped. (#/hr)	23%	6%	6%	0%	5%	0%	6%	7%	9%	0%	4%	6%
Heavy Vehicles (%)	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Turn Type	4	4	4	8	8	8	2	2	2	6	6	6
Protected Phases	4											
Permitted Phases	4											
Actuated Green, G (s)	24.1	24.1	24.1	24.1	24.1	24.1	51.5	51.5	51.5	51.5	51.5	51.5
Effective Green, g (s)	24.1	24.1	24.1	24.1	24.1	24.1	51.5	51.5	51.5	51.5	51.5	51.5
Actuated g/C Ratio	0.27	0.27	0.27	0.27	0.27	0.27	0.58	0.58	0.58	0.58	0.58	0.58
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	362	396	455	420	161	987	823	473	1016	847	847	847
v/s Ratio Prot	c0.24	0.02	0.11	0.01	0.38	0.26	0.01	0.04	c0.49	0.07	0.07	0.07
v/s Ratio Perm	0.89	0.06	0.39	0.02	0.66	0.45	0.02	0.06	0.84	0.12	0.12	0.12
w/c Ratio	31.1	23.9	26.3	23.7	12.6	10.6	7.9	8.1	15.3	8.4	8.4	8.4
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	29.5	0.1	0.6	0.0	20.8	15	0.0	0.2	9.2	0.3	0.3	0.3
Incremental Delay, d2	60.5	24.0	26.9	23.7	33.5	12.1	7.9	8.3	24.5	8.7	8.7	8.7
Delay (s)	E	C	C	C	C	C	B	A	A	C	A	A
Level of Service	52.8		26.4				15.8		21.5			
Approach Delay (s)	D		C				B		C			
Approach LOS												

Lanes, Volumes, Timings
3: Bank Street & Mitch Owens Road

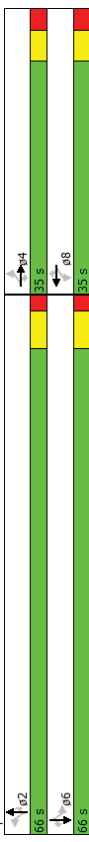
Lanes, Volumes, Timings
3: Bank Street & Mitch Owens Road

Lanes, Volumes, Timings
3: Bank Street & Mitch Owens Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	97	75	135	10	69	33	160	439	13	46	578	108
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00			1.00								
Fit		0.973	0.850		0.994		0.950		0.850		0.950	0.850
Flt Protected												
Satd. Flow (prot)	0	1748	1547	0	1763	1547	1729	1820	1517	1729	1820	1547
Flt Permitted		0.781			0.946		0.393		0.484			
Satd. Flow (perm)	0	1400	1547	0	1677	1547	715	1820	1517	881	1820	1547
Right Turn on Red		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Satd. Flow (RTOR)		135			39			60	38		60	108
Link Speed (k/h)		60			60			117.4			115.2	
Link Distance (m)		178.9			176.8			117.4			115.2	
Travel Time (s)		10.7			10.6			7.0			6.9	
Confl. Peds. (#/hr)		2		2								
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	0%	0%	2%	0%	0%	0%
Adj. Flow (vph)	97	75	135	10	69	33	160	439	13	46	578	108
Shared Lane Traffic (%)		0	172	135	0	79	33	160	439	13	46	578
Lane Group Flow (vph)	No	No	No	No	No	No	No	No	No	No	No	No
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.0	0.0	0.0	3.7	0.0
Link Offset(m)	0.0						0.0	0.0			0.0	
Crosswalk Width(m)	4.9			4.9			4.9				4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14	24	14	24	14	24	14	24	14	24	14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7			28.7				28.7	
Detector 2 Size(m)	1.8			1.8			1.8				1.8	
Detector 2 Type	Ch+Ex			Ch+Ex			Ch+Ex				Ch+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0			0.0			0.0				0.0	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	4			8			2				6	
Permitted Phases	4	4	4	8	8	8	2	2	2	2	6	6
Detector Phase	4	4	4	8	8	8	2	2	2	2	6	6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	29.5	29.5	29.5	29.5	29.5	29.5	24.6	24.6	24.6	24.6	24.6	24.6
Total Split (s)	35.0	35.0	35.0	35.0	35.0	35.0	66.0	66.0	66.0	66.0	66.0	66.0
Total Split (%)	34.7%	34.7%	34.7%	34.7%	34.7%	34.7%	65.3%	65.3%	65.3%	65.3%	65.3%	65.3%
Maximum Green (s)	28.5	28.5	28.5	28.5	28.5	28.5	59.4	59.4	59.4	59.4	59.4	59.4
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.8	2.8	2.8	2.8	2.8	2.8	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0	16.0	10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Act Effct Green (s)	16.1	16.1	16.1	16.1	16.1	16.1	60.4	60.4	60.4	60.4	60.4	60.4
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.18	0.18	0.67	0.67	0.67	0.67	0.67	0.67
v/c Ratio	0.69	0.35	0.26	0.11	0.33	0.36	0.01	0.08	0.47	0.10	0.17	0.17
Control Delay	49.2	8.1	32.8	9.1	9.6	8.1	0.3	6.7	9.4	1.7	1.7	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.2	8.1	32.8	9.1	9.6	8.1	0.3	6.7	9.4	1.7	1.7	1.7
LOS	D	A	C	A	A	A	A	A	A	A	A	A
Approach Delay	31.1		25.8				8.3				8.1	
Approach LOS	C		C				A				A	
Intersection Summary												
Area Type:	Other											
Cycle Length:	101											
Actuated Cycle Length:	89.7											
Natural Cycle:	60											
Control Type:	Semi Act-Uncoordinated											
Maximum v/c Ratio:	0.69											
Intersection Signal Delay:	13.3											
Intersection Capacity Utilization:	74.4%											
Analysis Period (min):	60											

Splits and Phases: 3: Bank Street & Mitch Owens Road



Queues
3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Future Background 2015 SAT

	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBR	
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBR	
Lane Group Flow (vph)	172	135	79	33	160	439	13	46	578	108
v/c Ratio	0.69	0.35	0.26	0.11	0.33	0.36	0.01	0.08	0.47	0.10
Control Delay	49.2	8.1	32.8	9.1	9.6	8.1	0.3	6.7	9.4	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.2	8.1	32.8	9.1	9.6	8.1	0.3	6.7	9.4	1.7
Queue Length 50th (m)	27.5	0.0	11.6	0.0	10.1	28.2	0.0	2.4	41.4	0.0
Queue Length 95th (m)	54.6	17.8	26.4	7.6	31.0	65.4	0.7	8.5	96.5	7.3
Internal Link Dist (m)	154.9		152.8		93.4				91.2	
Turn Bay Length (m)										
Base Capacity (vph)	445	584	533	519	481	1226	1034	593	1226	1077
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.23	0.15	0.06	0.33	0.36	0.01	0.08	0.47	0.10
Intersection Summary										

HCM Signalized Intersection Capacity Analysis
3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Future Background 2015 SAT

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR	
Lane Configurations												
Volume (vph)	97	75	135	10	69	33	160	439	13	46	578	108
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fit Protected	0.97	1.00	0.99	1.00	0.99	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1744	1547	1762	1547	1729	1820	1517	1729	1820	1517	1729	1820
Fit Permitted	0.78	1.00	0.95	1.00	0.99	1.00	0.39	1.00	0.48	1.00	0.48	1.00
Satd. Flow (perm)	1401	1547	1678	1547	1716	1820	1517	1716	1820	1517	1716	1820
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)	97	75	135	10	69	33	160	439	13	46	578	108
RTOR Reduction (vph)	0	0	111	0	0	27	0	0	4	0	0	35
Lane Group Flow (vph)	0	172	24	0	79	6	160	439	9	46	578	73
Conf. Ped. (#/hr)	2			2								
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	0%	0%	2%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	4	4		8	8		2	2		6	6	
Permitted Phases	4		4	8	8	2		2		6	6	
Actuated Green, G (s)	16.1	16.1	16.1	16.1	16.1	60.4	60.4	60.4	60.4	60.4	60.4	60.4
Effective Green, g (s)	16.1	16.1	16.1	16.1	16.1	60.4	60.4	60.4	60.4	60.4	60.4	60.4
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.18	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	251	277	301	277	482	1022	593	1022	593	1022	593	1022
v/s Ratio Prot						0.24						
v/s Ratio Perm	c0.12	0.02	0.05	0.00	0.22		0.01	0.05		0.01	0.05	
v/c Ratio	0.69	0.09	0.26	0.02	0.33	0.36	0.01	0.08	0.47	0.07	0.07	
Uniform Delay, d1	34.4	30.6	31.6	30.3	6.1	6.3	4.8	5.0	7.0	5.0	7.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.8	0.1	0.5	0.0	1.9	0.8	0.0	0.3	1.3	0.1	1.3	
Delay (s)	42.2	30.8	32.1	30.3	8.0	7.1	4.8	5.3	8.3	5.1	8.3	
Level of Service	D	C	C	C	A	A	A	A	A	A	A	
Approach Delay (s)	37.2		31.6		7.3		7.6		7.6		7.6	
Approach LOS	D		C		A		A		A		A	

Intersection Summary										
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service								
HCM 2000 Volume to Capacity ratio	0.52	B								
Actuated Cycle Length (s)	89.6	Sum of lost time (s)								
Intersection Capacity Utilization	74.4%	ICU Level of Service								
Analysis Period (min)	60	D								
c. Critical Lane Group										

2015 Total Future Conditions Without Improvements

Lanes, Volumes, Timings
3: Bank Street & Mitch Owens Road

Lanes, Volumes, Timings
3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Total Future 2015 AM

Bank Street @ Mitch Owens
Total Future 2015 AM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	323	135	97	26	128	46	185	562	14	13	196	110
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850
Fit Protected		0.966	0.966	0.992	0.992	0.950	0.950	0.950	0.950	0.950	0.950	0.950
Satd. Flow (prot)	0	1628	1334	0	1649	1419	1616	1717	1238	1320	1640	1218
Fit Permitted		0.696	0.696	0.891	0.891	0.633	0.633	0.633	0.633	0.633	0.633	0.633
Satd. Flow (perm)	0	1170	1334	0	1481	1419	1077	1717	1238	338	1640	1218
Right Turn on Red		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Satd. Flow (RTOR)		97	97	46	46	33	33	33	33	33	33	33
Link Speed (k/h)		60	60	60	60	60	60	60	60	60	60	60
Link Distance (m)		178.9	178.9	176.8	176.8	117.4	117.4	117.4	117.4	115.2	115.2	115.2
Travel Time (s)		10.7	10.7	10.6	10.6	7.0	7.0	7.0	7.0	6.9	6.9	6.9
Confl. Peds. (#/hr)		2	2	2	2	2	2	2	2	2	2	2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	8%	8%	16%	7%	10%	9%	7%	6%	25%	31%	11%	27%
Adj. Flow (vph)	323	135	97	26	128	46	185	562	14	13	196	110
Shared Lane Traffic (%)		0	458	97	0	154	46	185	562	14	13	196
Lane Group Flow (vph)	No	No	No	No	No	No	No	No	No	No	No	No
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Left	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Link Offset(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crosswalk Width(m)		4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14	24	14	24	14	24	14	24	14	24	14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7
Detector 2 Size(m)	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Detector 2 Type	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	Perm
Protected Phases		4		8	8	2	2	2	2	6	6	6
Permitted Phases	4	4	4	8	8	8	8	2	2	6	6	6
Detector Phase	4	4	4	8	8	8	8	2	2	6	6	6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	29.5	29.5	29.5	29.5	29.5	29.5	24.6	24.6	24.6	24.6	24.6	24.6
Total Split (s)	71.0	71.0	71.0	71.0	71.0	71.0	45.0	45.0	45.0	45.0	45.0	45.0
Total Split (%)	61.2%	61.2%	61.2%	61.2%	61.2%	61.2%	38.8%	38.8%	38.8%	38.8%	38.8%	38.8%
Maximum Green (s)	64.5	64.5	64.5	64.5	64.5	64.5	38.4	38.4	38.4	38.4	38.4	38.4
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.8	2.8	2.8	2.8	2.8	2.8	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0	16.0	10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Act Effct Green (s)	41.5	41.5	41.5	41.5	41.5	39.2	39.2	39.2	39.2	39.2	39.2	39.2
Actuated g/C Ratio	0.44	0.44	0.44	0.44	0.44	0.42	0.42	0.42	0.42	0.42	0.42	0.42
v/c Ratio	0.89	0.15	0.24	0.07	0.41	0.79	0.03	0.09	0.29	0.19	0.19	0.19
Control Delay	48.3	3.2	16.1	3.9	27.0	37.0	2.6	25.7	23.3	6.0	6.0	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.3	3.2	16.1	3.9	27.0	37.0	2.6	25.7	23.3	6.0	6.0	6.0
LOS	D	A	A	B	A	C	D	A	C	C	A	A
Approach Delay												
Approach LOS	D	D	D	B	B	B	C	C	C	B	B	B
Intersection Summary												
Area Type:	Other											
Cycle Length:	116											
Actuated Cycle Length:	94.1											
Natural Cycle:	90											
Control Type:	Semi Act-Uncoordinated											
Maximum v/c Ratio:	0.89											
Intersection Signal Delay:	30.8											
Intersection Capacity Utilization:	91.4%											
Analysis Period (min):	60											
Splits and Phases:	3: Bank Street & Mitch Owens Road											
	←	←	←	←	←	←	←	←	←	←	←	←
	45 s	45 s	45 s	45 s	45 s	45 s	45 s	45 s	45 s	45 s	45 s	45 s
	45 s	45 s	45 s	45 s	45 s	45 s	45 s	45 s	45 s	45 s	45 s	45 s

Queues

3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Total Future 2015 AM

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Group Flow (vph)	458	97	154	46	185	562	14	13	196	110	
v/c Ratio	0.89	0.15	0.24	0.07	0.41	0.79	0.03	0.09	0.29	0.19	
Control Delay	48.3	3.2	16.1	3.9	27.0	37.0	2.6	25.7	23.3	6.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	48.3	3.2	16.1	3.9	27.0	37.0	2.6	25.7	23.3	6.0	
Queue Length 50th (m)	72.4	0.0	16.5	0.0	22.8	85.3	0.0	1.4	22.7	0.0	
Queue Length 95th (m)	#144.3	9.3	31.4	6.3	65.8	#234.1	2.3	8.1	61.1	15.8	
Internal Link Dist (m)	154.9		152.8		93.4				91.2		
Turn Bay Length (m)											
Base Capacity (vph)	819	962	1036	1007	449	715	535	140	683	571	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.56	0.10	0.15	0.05	0.41	0.79	0.03	0.09	0.29	0.19	
Intersection Summary											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											

HCM Signalized Intersection Capacity Analysis

3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Total Future 2015 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	323	135	97	26	128	46	185	562	14	13	196	110
Volume (vph)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Ideal Flow (vphpl)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fit	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85
Fit Protected	0.97	1.00	0.99	1.00	0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1624	1334	1648	1419	1616	1717	1238	1320	1640	1218	1640	1218
Fit Permitted	0.70	1.00	0.89	1.00	0.63	1.00	1.00	0.24	1.00	1.00	0.24	1.00
Satd. Flow (perm)	1170	1334	1480	1419	1077	1717	1238	338	1640	1218	1640	1218
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)	323	135	97	26	128	46	185	562	14	13	196	110
RTOR Reduction (vph)	0	0	54	0	0	26	0	0	8	0	0	64
Lane Group Flow (vph)	0	458	43	0	154	20	185	562	6	13	196	46
Conf. Peds. (#/hr)	2		2									
Heavy Vehicles (%)	8%	8%	16%	7%	10%	9%	7%	6%	25%	31%	11%	27%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	4	4		8	8		2		2	6	6	6
Permitted Phases	4	4	8	8	8	2	2	2	2	6	6	6
Actuated Green, G (s)	41.5	41.5	41.5	41.5	41.5	39.2	39.2	39.2	39.2	39.2	39.2	39.2
Effective Green, g (s)	41.5	41.5	41.5	41.5	41.5	39.2	39.2	39.2	39.2	39.2	39.2	39.2
Actuated g/C Ratio	0.44	0.44	0.44	0.44	0.44	0.42	0.42	0.42	0.42	0.42	0.42	0.42
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	517	590	654	627	450	717	517	141	685	509	685	509
v/s Ratio Prot							c0.33				0.12	
v/s Ratio Perm	c0.39	0.03	0.10	0.01	0.17		0.00	0.04		0.04		0.04
v/c Ratio	0.89	0.07	0.24	0.03	0.41	0.78	0.01	0.09	0.29	0.09	0.29	0.09
Uniform Delay, d1	24.0	15.1	16.3	14.8	19.2	23.6	16.0	16.5	18.0	16.5	18.0	16.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	19.9	0.1	0.2	0.0	2.8	8.9	0.0	1.3	1.1	0.4	1.1	0.4
Delay (s)	43.9	15.1	16.5	14.8	22.0	32.5	16.0	17.8	19.1	16.9	19.1	16.9
Level of Service	D	B	B	B	C	C	B	B	B	B	B	B
Approach Delay (s)		38.9		16.1		29.7		18.3				
Approach LOS		D		B		C		B				B

3/4/2014

Synchro 8 Report

IV

Page 4

Page 3

Lanes, Volumes, Timings
3: Bank Street & Mitch Owens Road

Lanes, Volumes, Timings
3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Total Future 2015 PM

Bank Street @ Mitch Owens
Total Future 2015 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	156	256	87	20	178	36	156	422	26	29	904	205
Volume (vph)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Ideal Flow (vphpl)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850
Fit Protected	0.981	0.981	0.981	0.981	0.981	0.981	0.981	0.981	0.981	0.981	0.981	0.981
Satd. Flow (prot)	0	1588	1459	0	1733	1547	1631	1701	1419	1729	1750	1459
Fit Permitted	0.714	0.714	0.714	0.714	0.714	0.714	0.714	0.714	0.714	0.714	0.714	0.714
Satd. Flow (perm)	0	1154	1459	0	1407	1547	108	1701	1419	939	1750	1459
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Satd. Flow (RTOR)	93	93	93	93	93	93	93	93	93	93	93	93
Link Speed (k/h)	60	60	60	60	60	60	60	60	60	60	60	60
Link Distance (m)	178.9	178.9	178.9	178.9	178.9	178.9	178.9	178.9	178.9	178.9	178.9	178.9
Travel Time (s)	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7
Confl. Peds. (#/hr)	2	2	2	2	2	2	2	2	2	2	2	2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	23%	6%	6%	0%	5%	0%	6%	7%	9%	0%	4%	6%
Adj. Flow (vph)	156	256	87	20	178	36	156	422	26	29	904	205
Shared Lane Traffic (%)	0	412	87	0	198	36	156	422	26	29	904	205
Lane Group Flow (vph)	No	No	No	No	No	No	No	No	No	No	No	No
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Link Offset(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crosswalk Width(m)	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14	24	14	24	14	24	14	24	14	24	14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7
Detector 2 Size(m)	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Detector 2 Type	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	4	4	4	8	8	4	8	8	4	8	8	4
Permitted Phases	4	4	4	8	8	8	8	8	4	8	8	8
Detector Phase	4	4	4	8	8	8	8	8	4	8	8	8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Initial (s)	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5
Minimum Split (s)	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
Total Split (s)	36.7%	36.7%	36.7%	36.7%	36.7%	36.7%	36.7%	36.7%	36.7%	36.7%	36.7%	36.7%
Total Split (%)	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5
Maximum Green (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Yellow Time (s)	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead-Lag Optimize?	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	None	None	None	None	None	None	None	None	None	None	None	None
Recall Mode	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Act Effct Green (s)	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5
Actuated g/C Ratio	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
v/c Ratio	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Control Delay	333.2	6.1	37.1	0.2	285.3	15.9	3.1	18.0	232.5	7.3	7.3	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	333.2	6.1	37.1	0.2	285.3	15.9	3.1	18.0	232.5	7.3	7.3	7.3
LOS	F	A	D	A	F	B	A	F	B	A	F	A
Approach Delay	276.2	31.4	C									
Approach LOS	F	F	C									
Intersection Summary												
Area Type:	Other											
Cycle Length: 120												
Actuated Cycle Length: 120												
Natural Cycle: 120												
Control Type: Semi Act-Uncoord												
Maximum v/c Ratio: 1.14												
Intersection Signal Delay: 165.1												
Intersection Capacity Utilization 115.6%												
Analysis Period (min) 60												
Splits and Phases:	3: Bank Street & Mitch Owens Road											
	62	63 s	64 s	65	66	67	68	69	70	71	72	73
	13 s	63 s	64 s	65	66	67	68	69	70	71	72	73

Queues
3: Bank Street & Mitch Owens Road

HCM Signalized Intersection Capacity Analysis
3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Total Future 2015 PM

Bank Street @ Mitch Owens
Total Future 2015 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	412	87	198	36	156	422	26	29	904	205		
v/c Ratio	1.14	0.17	0.45	0.07	1.09	0.43	0.03	0.07	1.10	0.27		
Control Delay	333.2	6.1	37.1	0.2	285.3	15.9	3.1	18.0	232.5	7.3		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	333.2	6.1	37.1	0.2	285.3	15.9	3.1	18.0	232.5	7.3		
Queue Length 50th (m)	~113.5	0.0	37.2	0.0	~27.0	52.8	0.0	3.7	~241.4	8.1		
Queue Length 95th (m)	#203.2	13.3	68.3	0.0	#83.3	88.9	3.9	10.4	#374.2	28.1		
Internal Link Dist (m)	154.9		152.8			93.4				91.2		
Turn Bay Length (m)												
Base Capacity (vph)	360	519	439	547	143	983	834	441	822	760		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	1.14	0.17	0.45	0.07	1.09	0.43	0.03	0.07	1.10	0.27		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	156	256	87	20	178	36	156	422	26	29	904	205
Volume (vph)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Ideal Flow (vphpl)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fibp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fibp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fit Protected	0.98	1.00	0.99	1.00	0.99	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1586	1459	1733	1547	1631	1701	1419	1729	1750	1459		
Fit Permitted	0.71	1.00	0.81	1.00	0.81	1.00	0.06	1.00	0.06	1.00	1.00	1.00
Satd. Flow (perm)	1154	1459	1407	1547	109	1701	1419	939	1750	1459		
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)	156	256	87	20	178	36	156	422	26	29	904	205
RTOR Reduction (vph)	0	0	60	0	25	0	0	11	0	0	0	75
Lane Group Flow (vph)	0	412	27	0	198	11	156	422	15	29	904	130
Confli. Peds. (#/hr)	2		2									
Heavy Vehicles (%)	23%	6%	6%	0%	5%	0%	6%	7%	9%	0%	4%	6%
Turn Type	Permitted	NA	Permitted	NA	Permitted	NA	Permitted	NA	Permitted	NA	Permitted	NA
Protected Phases	4	4	4	8	8	8	5	2	2	6	6	6
Permitted Phases	4	4	4	8	8	8	2	2	2	6	6	6
Actuated Green, G (s)	37.5	37.5	37.5	37.5	37.5	37.5	69.4	69.4	69.4	56.4	56.4	56.4
Effective Green, g (s)	37.5	37.5	37.5	37.5	37.5	37.5	69.4	69.4	69.4	56.4	56.4	56.4
Actuated g/C Ratio	0.31	0.31	0.31	0.31	0.31	0.31	0.58	0.58	0.58	0.47	0.47	0.47
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	360	455	439	483	144	983	820	441	822	685		
v/s Ratio Prot							c0.06	0.25				
v/s Ratio Perm	c0.36	0.02	0.14	0.01	c0.57		0.01	0.03				
v/c Ratio	1.14	0.06	0.45	0.02	1.08	0.43	0.02	0.07	1.10	0.19		
Uniform Delay, d1	41.2	28.9	33.0	28.6	34.6	14.2	10.8	17.4	31.8	18.5		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	294.9	0.1	0.7	0.0	248.2	1.4	0.0	0.3	201.1	0.6		
Delay (s)	336.2	29.0	33.8	28.6	282.8	15.6	10.8	17.7	232.9	19.1		
Level of Service	F	C	C	C	F	B	B	B	F	B		
Approach Delay (s)	282.6		33.0			84.4			188.9			
Approach LOS	F		C			F			F			

Intersection Summary				
HCM 2000 Control Delay	167.6	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.13			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.7	
Intersection Capacity Utilization	115.6%	ICU Level of Service	H	
Analysis Period (min)	60			
c Critical Lane Group				

Lanes, Volumes, Timings

3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens

Total Future 2015 SAT

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	224	109	135	16	84	33	275	358	13	46	643	132
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00			1.00								
Fit	0.967	0.850		0.992	0.850		0.950	0.850		0.950		0.850
Flt Protected	0	1743	1547	0	1761	1547	1729	1820	1517	1729	1820	1547
Satd. Flow (prot)	0.737			0.917			0.297			0.512		
Flt Permitted	0	1325	1547	0	1627	1547	541	1820	1517	932	1820	1547
Satd. Flow (perm)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Right Turn on Red		135		39					38			132
Satd. Flow (RTOR)		60		60				60			60	
Link Speed (k/h)		178.9		176.8			117.4			115.2		
Link Distance (m)		10.7		10.6			7.0			6.9		
Travel Time (s)		2		2								
Confl. Peds. (#/hr)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Peak Hour Factor	0%	3%	0%	0%	3%	0%	0%	0%	2%	0%	0%	0%
Heavy Vehicles (%)	224	109	135	16	84	33	275	358	13	46	643	132
Adj. Flow (vph)	0	333	135	0	100	33	275	358	13	46	643	132
Shared Lane Traffic (%)	No	No	No	No	No	No	No	No	No	No	No	No
Lane Group Flow (vph)	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Enter Blocked Intersection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Link Offset(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crosswalk Width(m)	4.9			4.9			4.9			4.9		
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14	24	14	24	14	24	14	24	14	24	14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7			28.7			28.7		
Detector 2 Size(m)	1.8			1.8			1.8			1.8		
Detector 2 Type	Ch+Ex			Ch+Ex			Ch+Ex			Ch+Ex		
Detector 2 Channel												
Detector 2 Extend (s)	0.0			0.0			0.0			0.0		
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	4			8			2			6		
Permitted Phases	4	4	4	8	8	8	2	2	2	6	6	6
Detector Phase	4	4	4	8	8	8	2	2	2	6	6	6

Lanes, Volumes, Timings

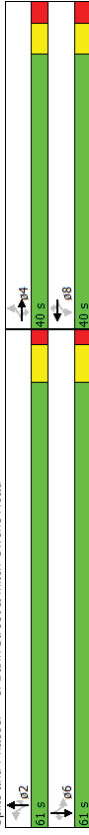
3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens

Total Future 2015 SAT

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	29.5	29.5	29.5	29.5	29.5	29.5	24.6	24.6	24.6	24.6	24.6	24.6
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	61.0	61.0	61.0	61.0	61.0	61.0
Total Split (%)	39.6%	39.6%	39.6%	39.6%	39.6%	39.6%	60.4%	60.4%	60.4%	60.4%	60.4%	60.4%
Maximum Green (s)	33.5	33.5	33.5	33.5	33.5	33.5	54.4	54.4	54.4	54.4	54.4	54.4
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.8	2.8	2.8	2.8	2.8	2.8	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0	16.0	10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Act Effct Green (s)	27.6	27.6	27.6	27.6	27.6	27.6	54.6	54.6	54.6	54.6	54.6	54.6
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29	0.29	0.57	0.57	0.57	0.57	0.57	0.57
v/c Ratio	0.87	0.25	0.21	0.07	0.89	0.34	0.01	0.09	0.02	0.14	0.09	0.02
Control Delay	60.4	5.6	26.2	6.9	62.3	13.0	0.5	11.4	17.9	2.5	0.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.4	5.6	26.2	6.9	62.3	13.0	0.5	11.4	17.9	2.5	0.0	0.0
LOS	E	A	C	A	E	B	A	B	A	B	B	A
Approach Delay	44.5		21.4				33.7			15.1		
Approach LOS	D		C				C			B		
Intersection Summary												
Area Type:	Other											
Cycle Length:	101											
Actuated Cycle Length:	95.4											
Natural Cycle:	90											
Control Type:	Semi Act-Uncoord											
Maximum v/c Ratio:	0.89											
Intersection Signal Delay:	28.0											
Intersection Capacity Utilization	94.0%											
Analysis Period (min)	60											

Splits and Phases: 3: Bank Street & Mitch Owens Road



Queues

3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Total Future 2015 SAT

Lane Group	EBT	EBR	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	333	135	100	33	275	358	13	46	643
v/c Ratio	0.87	0.25	0.21	0.07	0.89	0.34	0.01	0.09	0.62
Control Delay	60.4	5.6	26.2	6.9	62.3	13.0	0.5	11.4	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.4	5.6	26.2	6.9	62.3	13.0	0.5	11.4	17.9
Queue Length 50th (m)	57.8	0.0	13.8	0.0	43.6	34.7	0.0	3.8	77.6
Queue Length 95th (m)	#119.8	16.0	29.3	6.7	#119.8	66.6	0.9	11.0	150.0
Internal Link Dist (m)	154.9		152.8		93.4				91.2
Turn Bay Length (m)									
Base Capacity (vph)	467	632	573	570	309	1041	884	533	1041
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.21	0.17	0.06	0.89	0.34	0.01	0.09	0.62
Intersection Summary									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									

HCM Signalized Intersection Capacity Analysis

3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Total Future 2015 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	224	109	135	16	84	33	275	358	13	46	643	132
Volume (vph)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Ideal Flow (vphpl)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frb. ped/bikes	1.00	1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected	0.97	1.00	0.99	1.00	0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1739	1547	1761	1547	1729	1820	1517	1729	1820	1517	1729	1820
Flt Permitted	0.74	1.00	0.92	1.00	0.92	1.00	0.30	1.00	1.00	0.51	1.00	1.00
Satd. Flow (perm)	1326	1547	1628	1547	540	1820	1517	931	1820	1517	931	1820
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)	224	109	135	16	84	33	275	358	13	46	643	132
RTOR Reduction (vph)	0	0	96	0	0	23	0	0	6	0	0	56
Lane Group Flow (vph)	0	333	39	0	100	10	275	358	7	46	643	76
Conf. Peds. (#/hr)	2		2									
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	0%	0%	2%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	4	4		8	8		2		2	6	6	6
Permitted Phases	4		4	8		8	2		2			
Actuated Green, G (s)	27.7	27.7	27.7	27.7	27.7	27.7	54.6	54.6	54.6	54.6	54.6	54.6
Effective Green, g (s)	27.7	27.7	27.7	27.7	27.7	27.7	54.6	54.6	54.6	54.6	54.6	54.6
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29	0.29	0.57	0.57	0.57	0.57	0.57	0.57
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	385	449	472	449	309	1041	868	532	1041	868	532	885
v/s Ratio Prot							0.20				0.35	
v/s Ratio Perm	c0.25	0.03	0.06	0.01	c0.51	0.02	0.00	0.05	0.00	0.05	0.05	0.09
v/c Ratio	0.86	0.09	0.21	0.02	0.89	0.34	0.01	0.09	0.01	0.09	0.62	0.09
Uniform Delay, d1	32.1	24.6	25.6	24.2	17.8	10.9	8.8	9.2	8.8	9.2	13.5	9.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	21.4	0.1	0.2	0.0	39.3	0.9	0.0	0.3	0.0	0.3	2.8	0.2
Delay (s)	53.4	24.7	25.8	24.2	57.1	11.8	8.8	9.5	8.8	9.5	16.3	9.4
Level of Service	D	C	C	C	E	B	A	A	A	A	B	A
Approach Delay (s)	45.2		25.4		31.0			14.8				
Approach LOS	D		C		C			B				B

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IV

Synchro 8 Report

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IV

Synchro 8 Report

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2015 Total Future Conditions With Improvements

Lanes, Volumes, Timings

3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Total Future 2015 AM with improvements

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	323	135	97	26	128	46	185	562	14	13	196	110
Volume (vph)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Ideal Flow (vphpl)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
Fit Protected	1601	1685	1334	1616	1655	1419	1616	1717	1238	1320	1640	1218
Satd. Flow (prot)	0.675	0.671	0.634	0.634	0.634	0.634	0.634	0.634	0.634	0.634	0.634	0.634
Fit Permitted	1133	1685	1334	1137	1655	1419	1078	1717	1238	463	1640	1218
Satd. Flow (perm)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Right Turn on Red	97	60	60	60	60	46	33	60	33	60	60	110
Satd. Flow (RTOR)	178.9	10.7	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6
Link Distance (m)	2	2	2	2	2	2	2	2	2	2	2	2
Travel Time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Confl. Peds. (#/hr)	8%	8%	16%	7%	10%	9%	7%	6%	25%	31%	11%	27%
Heavy Vehicles (%)	323	135	97	26	128	46	185	562	14	13	196	110
Adj. Flow (vph)	323	135	97	26	128	46	185	562	14	13	196	110
Shared Lane Traffic (%)	No	No	No	No	No	No	No	No	No	No	No	No
Lane Group Flow (vph)	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right
Enter Blocked Intersection	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Lane Alignment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Median Width(m)	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Crosswalk Width(m)	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Headway Factor	24	14	24	14	24	14	24	14	24	14	24	14
Turning Speed (k/h)	1	2	1	1	2	1	1	2	1	1	2	1
Number of Detectors	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Detector Template	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Leading Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Size(m)	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 1 Type	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Channel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7
Detector 2 Size(m)	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 2 Type	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Channel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	Perm
Protected Phases	4	4	8	8	8	8	2	2	2	6	6	6
Permitted Phases	4	4	4	8	8	8	2	2	2	6	6	6
Detector Phase	4	4	4	8	8	8	2	2	2	6	6	6

Lanes, Volumes, Timings

3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Total Future 2015 AM with improvements

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Initial (s)	29.5	29.5	29.5	29.5	29.5	29.5	24.6	24.6	24.6	24.6	24.6	24.6
Minimum Split (s)	55.0	55.0	55.0	55.0	55.0	55.0	61.0	61.0	61.0	61.0	61.0	61.0
Total Split (s)	47.4%	47.4%	47.4%	47.4%	47.4%	47.4%	52.6%	52.6%	52.6%	52.6%	52.6%	52.6%
Total Split (%)	48.5	48.5	48.5	48.5	48.5	48.5	54.4	54.4	54.4	54.4	54.4	54.4
Maximum Green (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
Yellow Time (s)	2.8	2.8	2.8	2.8	2.8	2.8	2.0	2.0	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Total Lost Time (s)	Lead/Lag											
Lead/Lag Optimize?	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	None	None	None	None	None	None	Max	Max	Max	Max	Max	Max
Recall Mode	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0	16.0	10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Act Effct Green (s)	33.6	33.6	33.6	33.6	33.6	33.6	54.9	54.9	54.9	54.9	54.9	54.9
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.33	0.33	0.54	0.54	0.54	0.54	0.54	0.54
v/c Ratio	0.86	0.24	0.19	0.07	0.23	0.09	0.32	0.61	0.02	0.05	0.22	0.16
Control Delay	59.2	24.8	5.3	22.0	24.7	6.5	17.4	21.9	1.6	15.9	15.2	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.2	24.8	5.3	22.0	24.7	6.5	17.4	21.9	1.6	15.9	15.2	3.7
LOS	E	C	A	C	C	A	B	C	A	B	B	A
Approach Delay	41.4	20.1	20.1	20.1	20.1	20.1	20.4	20.4	20.4	20.4	20.4	20.4
Approach LOS	D	C	C	C	C	C	C	C	C	C	C	C
Intersection Summary	Other											
Area Type:	Cycle Length: 116											
Actuated Cycle Length: 101.8												
Natural Cycle: 60												
Control Type: Semi Act-Uncoordinated												
Maximum v/c Ratio: 0.86												
Intersection Signal Delay: 25.1												
Intersection Capacity Utilization 82.4%												
Analysis Period (min) 60												
Splits and Phases:	3: Bank Street & Mitch Owens Road											
g2	g3	g4	g5	g6	g7	g8	g9	g10	g11	g12	g13	g14
6.1 s	3.7 s	3.7 s	3.7 s	3.7 s	3.7 s	3.7 s	3.7 s	3.7 s	3.7 s	3.7 s	3.7 s	3.7 s
6.1 s	3.7 s	3.7 s	3.7 s	3.7 s	3.7 s	3.7 s	3.7 s	3.7 s	3.7 s	3.7 s	3.7 s	3.7 s

Queues
3: Bank Street & Mitch Owens Road

HCM Signalized Intersection Capacity Analysis
3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Total Future 2015 AM with Improvements

Bank Street @ Mitch Owens
Total Future 2015 AM with Improvements

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	323	135	97	26	128	46	185	562	14	13	196	110
v/c Ratio	0.86	0.24	0.19	0.07	0.23	0.09	0.32	0.61	0.02	0.05	0.22	0.16
Control Delay	59.2	24.8	5.3	22.0	24.7	6.5	17.4	21.9	1.6	15.9	15.2	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.2	24.8	5.3	22.0	24.7	6.5	17.4	21.9	1.6	15.9	15.2	3.7
Queue Length 50th (m)	58.7	19.1	0.0	3.5	18.0	0.0	19.6	73.3	0.0	1.2	19.5	0.0
Queue Length 95th (m)	#1188	36.5	12.5	10.1	35.0	8.4	51.1	167.5	1.8	6.0	47.4	12.2
Internal Link Dist (m)	154.9											
Turn Bay Length (m)	152.8											
Base Capacity (vph)	545	810	682	547	796	706	581	926	683	249	885	707
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.17	0.14	0.05	0.16	0.07	0.32	0.61	0.02	0.05	0.22	0.16
Intersection Summary												
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Volume (vph)	323	135	97	26	128	46	185	562	14	13	196	110
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fit	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1595	1685	1334	1610	1655	1419	1616	1717	1238	1320	1640	1218
Fit Permitted	0.67	1.00	1.00	0.67	1.00	1.00	0.63	1.00	1.00	0.33	1.00	1.00
Satd. Flow (perm)	1133	1685	1334	1137	1655	1419	1079	1717	1238	462	1640	1218
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)	323	135	97	26	128	46	185	562	14	13	196	110
RTOR Reduction (vph)	0	0	65	0	0	31	0	0	6	0	0	51
Lane Group Flow (vph)	323	135	32	26	128	15	185	562	8	13	196	59
Conf. Peds. (#/hr)	2											
Heavy Vehicles (%)	8%											
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	4											
Permitted Phases	4											
Actuated Green, G (s)	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6
Effective Green, g (s)	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.33	0.33	0.34	0.54	0.54	0.54	0.54	0.54
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	374	557	441	376	547	469	583	927	668	249	886	688
v/s Ratio Prot	0.08											
v/s Ratio Perm	0.02											
v/c Ratio	0.86	0.24	0.07	0.07	0.23	0.03	0.32	0.61	0.01	0.03	0.12	0.05
Uniform Delay, d1	31.9	24.7	23.3	23.3	24.7	23.0	13.0	16.0	10.8	11.0	12.2	11.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	21.7	0.2	0.1	0.1	0.2	0.0	1.4	3.0	0.0	0.4	0.6	0.3
Delay (s)	53.6	25.0	23.4	23.4	24.9	23.0	14.4	18.9	10.8	11.4	12.8	11.6
Level of Service	D	C	C	C	C	C	B	B	B	B	B	B
Approach Delay (s)	41.3											
Approach LOS	D											

Lanes, Volumes, Timings

3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Total Future 2015 PM - with improvements

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	156	256	87	20	178	36	156	422	26	29	904	205
Volume (vph)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Ideal Flow (vphpl)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850
Ped Bike Factor	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
Fit Protected	1406	1717	1459	1729	1733	1547	1631	1701	1419	1729	1750	1459
Satd. Flow (prot)	0.558	0.397	0.134	0.397	0.134	0.482	0.397	0.134	0.397	0.134	0.482	0.397
Fit Permitted	823	1717	1459	720	1733	1547	333	1701	1419	877	1750	1459
Satd. Flow (perm)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Right Turn on Red	87	87	87	36	36	36	36	36	36	36	36	36
Satd. Flow (RTOR)	Link Speed (k/h)	60	60	60	60	60	60	60	60	60	60	60
Link Distance (m)	178.9	178.9	178.9	176.8	176.8	176.8	117.4	117.4	117.4	117.4	115.2	115.2
Travel Time (s)	10.7	10.7	10.7	10.6	10.6	10.6	7.0	7.0	7.0	7.0	6.9	6.9
Confl. Peds. (#/hr)	2	2	2	2	2	2	2	2	2	2	2	2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	23%	6%	6%	0%	5%	0%	6%	7%	9%	0%	4%	6%
Adj. Flow (vph)	156	256	87	20	178	36	156	422	26	29	904	205
Shared Lane Traffic (%)	156	256	87	20	178	36	156	422	26	29	904	205
Lane Group Flow (vph)	156	256	87	20	178	36	156	422	26	29	904	205
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Link Offset(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crosswalk Width(m)	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Two way Left Turn Lane	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Headway Factor	24	14	24	14	24	14	24	14	24	14	24	14
Turning Speed (k/h)	1	2	1	1	2	1	1	2	1	1	2	1
Number of Detectors	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Detector Template	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Leading Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Size(m)	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 1 Type	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Channel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	28.7	1.8	28.7	28.7	1.8	28.7	28.7	1.8	28.7	28.7	1.8	28.7
Detector 2 Size(m)	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 2 Type	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Channel	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Detector 2 Extend (s)	4	4	4	4	4	4	4	4	4	4	4	4
Protected Phases	4	4	4	4	4	4	4	4	4	4	4	4
Permitted Phases	4	4	4	4	4	4	4	4	4	4	4	4
Detector Phase	4	4	4	4	4	4	4	4	4	4	4	4

Lanes, Volumes, Timings

3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Total Future 2015 PM - with improvements

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Initial (s)	29.5	29.5	29.5	29.5	29.5	29.5	24.6	24.6	24.6	24.6	24.6	24.6
Minimum Split (s)	37.0	37.0	37.0	37.0	37.0	37.0	83.0	83.0	83.0	83.0	83.0	83.0
Total Split (s)	30.8%	30.8%	30.8%	30.8%	30.8%	30.8%	69.2%	69.2%	69.2%	69.2%	69.2%	69.2%
Total Split (%)	30.5	30.5	30.5	30.5	30.5	30.5	76.4	76.4	76.4	76.4	76.4	76.4
Maximum Green (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
Yellow Time (s)	2.8	2.8	2.8	2.8	2.8	2.8	2.0	2.0	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Total Lost Time (s)	Lead/Lag											
Lead/Lag Optimize?	Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max	Max
Flash Dont Walk (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Pedestrian Calls (#/hr)	16.0	16.0	16.0	16.0	16.0	16.0	10.0	10.0	10.0	10.0	10.0	10.0
Act Effct Green (s)	0	0	0	0	0	0	0	0	0	0	0	0
Actuated g/C Ratio	24.7	24.7	24.7	24.7	24.7	24.7	76.7	76.7	76.7	76.7	76.7	76.7
v/c Ratio	0.22	0.22	0.22	0.22	0.22	0.22	0.67	0.67	0.67	0.67	0.67	0.67
Control Delay	0.88	0.69	0.23	0.13	0.48	0.10	0.70	0.37	0.03	0.05	0.77	0.20
Queue Delay	102.7	51.9	8.8	37.2	43.3	11.4	35.8	10.3	2.3	8.2	20.2	1.6
Total Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LOS	102.7	51.9	8.8	37.2	43.3	11.4	35.8	10.3	2.3	8.2	20.2	1.6
Approach Delay	F	D	A	D	D	B	D	B	A	A	C	A
Approach LOS	60.3	60.3	37.9	D	D	D	B	B	B	B	B	B
Intersection Summary	Area Type:	Other										
Cycle Length: 120	Actuated Cycle Length: 114.5	Natural Cycle: 90	Control Type: Semi Act/Uncoordinated	Maximum v/c Ratio: 0.88	Intersection Signal Delay: 27.4	Intersection LOS: C	ICU Level of Service G	Analysis Period (min) 60				
Splits and Phases:	3: Bank Street & Mitch Owens Road											
82	83 s	83 s	83 s	83 s	83 s	83 s	83 s	83 s	83 s	83 s	83 s	83 s
86	83 s	83 s	83 s	83 s	83 s	83 s	83 s	83 s	83 s	83 s	83 s	83 s

Queues

3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Total Future 2015 PM - with improvements

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	156	256	87	20	178	36	156	422	26	29	904	205
v/c Ratio	0.88	0.69	0.23	0.13	0.48	0.10	0.70	0.37	0.03	0.05	0.77	0.20
Control Delay	102.7	51.9	8.8	37.2	43.3	11.4	35.8	10.3	2.3	8.2	20.2	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.7	51.9	8.8	37.2	43.3	11.4	35.8	10.3	2.3	8.2	20.2	1.6
Queue Length 50th (m)	34.0	53.1	0.0	3.6	35.0	0.0	21.4	40.9	0.0	2.2	136.4	0.0
Queue Length 95th (m)	#80.6	91.9	15.7	11.6	63.4	9.9	#79.9	74.9	3.3	6.8	#302.8	11.3
Internal Link Dist (m)	154.9			152.8				93.4				91.2
Turn Bay Length (m)												
Base Capacity (vph)	220	458	453	192	463	440	223	1138	960	587	1171	1044
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.56	0.19	0.10	0.38	0.08	0.70	0.37	0.03	0.05	0.77	0.20
Intersection Summary												
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.												

HCM Signalized Intersection Capacity Analysis

3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Total Future 2015 PM - with improvements

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Volume (vph)	156	256	87	20	178	36	156	422	26	29	904	205
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fit Protected	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fit Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1401	1717	1459	1724	1733	1547	1631	1701	1419	1729	1750	1459
Satd. Flow (perm)	0.56	1.00	1.00	0.40	1.00	1.00	0.19	1.00	1.00	0.48	1.00	1.00
Peak-hour factor, PHF	822	1717	1459	721	1733	1547	333	1701	1419	878	1750	1459
Adj. Flow (vph)	156	256	87	20	178	36	156	422	26	29	904	205
RTOR Reduction (vph)	0	0	68	0	0	28	0	0	9	0	0	68
Lane Group Flow (vph)	156	256	19	20	178	8	156	422	17	29	904	137
Conf. Peds. (#/hr)	2			2								
Heavy Vehicles (%)	23%	6%	6%	0%	5%	0%	6%	7%	9%	0%	4%	6%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	4	4		8	8		2		2		6	
Permitted Phases	4	4	4	8	8	8	2	2	2	6	6	6
Actuated Green, G (s)	24.7	24.7	24.7	24.7	24.7	24.7	76.6	76.6	76.6	76.6	76.6	76.6
Effective Green, g (s)	24.7	24.7	24.7	24.7	24.7	24.7	76.6	76.6	76.6	76.6	76.6	76.6
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22	0.22	0.67	0.67	0.67	0.67	0.67	0.67
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	177	370	315	155	374	334	222	1138	950	587	1171	976
v/s Ratio Prot	0.15			0.10			0.25				0.52	
v/s Ratio Perm	0.19	0.01	0.03	0.03	0.48	0.01	0.47	0.01	0.03	0.03	0.09	0.14
v/c Ratio	0.88	0.69	0.06	0.13	0.48	0.02	0.70	0.37	0.02	0.05	0.77	0.14
Uniform Factor, d1	43.4	41.3	35.6	36.2	39.2	35.3	11.8	8.3	6.3	6.5	12.9	6.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	49.5	5.7	0.1	0.4	1.0	0.0	18.5	0.9	0.0	0.2	5.1	0.3
Delay (s)	93.0	47.0	35.7	36.6	40.2	35.4	30.3	9.2	6.4	6.6	18.1	7.2
Level of Service	F	D	D	D	D	D	C	A	A	A	B	A
Approach Delay (s)	59.4			39.1			14.6				15.8	
Approach LOS	E			D			B				B	
Intersection Summary												
HCM 2000 Control Delay	26.5 HCM 2000 Level of Service C											
HCM 2000 Volume to Capacity ratio	0.80											
Actuated Cycle Length (s)	114.4 Sum of lost time (s) 13.1											
Intersection Capacity Utilization	100.2% ICU Level of Service G											
Analysis Period (min)	60											
Critical Lane Group												

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Lanes, Volumes, Timings

3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Total Future 2015 SAT with improvements

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	224	109	135	16	84	33	275	358	13	46	643	132
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00			1.00								
Fit	0.950		0.850		0.950		0.850		0.850		0.850	0.850
Flt Protected	1729	1767	1547	1729	1767	1547	1729	1820	1517	1729	1820	1547
Satd. Flow (prot)	0.702		0.687		0.342		0.342		0.532		0.532	
Flt Permitted	1273	1767	1547	1246	1767	1547	622	1820	1517	988	1820	1547
Satd. Flow (perm)		Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes
Right Turn on Red		135			39			38			60	132
Satd. Flow (RTOR)		60			60			60			60	
Link Speed (k/h)		178.9			176.8			117.4			115.2	
Link Distance (m)		10.7			10.6			7.0			6.9	
Travel Time (s)		2			2							
Confl. Peds. (#/hr)		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Peak Hour Factor		0%	3%	0%	3%	0%	0%	0%	2%	0%	0%	0%
Heavy Vehicles (%)		224	109	135	16	84	33	275	358	13	46	643
Adj. Flow (vph)		224	109	135	16	84	33	275	358	13	46	643
Shared Lane Traffic (%)		No	No	No	No	No	No	No	No	No	No	No
Lane Group Flow (vph)		No	No	No	No	No	No	No	No	No	No	No
Enter Blocked Intersection		No	No	No	No	No	No	No	No	No	No	No
Lane Alignment		Left	Left	Right	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7		3.7		3.7		3.7		3.7		3.7
Link Offset(m)		0.0		0.0		0.0		0.0		0.0		0.0
Crosswalk Width(m)		4.9		4.9		4.9		4.9		4.9		4.9
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14	24	14	24	14	24	14	24	14	24	14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7			28.7				28.7	
Detector 2 Size(m)	1.8			1.8			1.8				1.8	
Detector 2 Type	Ch+Ex			Ch+Ex			Ch+Ex				Ch+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0			0.0			0.0				0.0	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		8	2		2		6	
Permitted Phases	4	4	4	8	8	8	2	2	2	6	6	6
Detector Phase	4	4	4	8	8	8	2	2	2	6	6	6

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Synchro 8 Report

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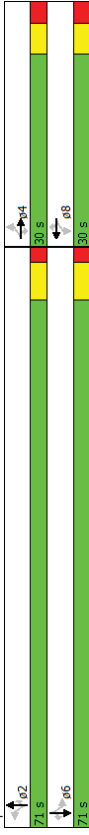
Lanes, Volumes, Timings

3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Total Future 2015 SAT with improvements

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	29.5	29.5	29.5	29.5	29.5	29.5	24.6	24.6	24.6	24.6	24.6	24.6
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	71.0	71.0	71.0	71.0	71.0	71.0
Total Split (%)	29.7%	29.7%	29.7%	29.7%	29.7%	29.7%	70.3%	70.3%	70.3%	70.3%	70.3%	70.3%
Maximum Green (s)	23.5	23.5	23.5	23.5	23.5	23.5	64.4	64.4	64.4	64.4	64.4	64.4
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.8	2.8	2.8	2.8	2.8	2.8	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0	16.0	10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Act Effct Green (s)	20.6	20.6	20.6	20.6	20.6	20.6	64.5	64.5	64.5	64.5	64.5	64.5
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.21	0.21	0.66	0.66	0.66	0.66	0.66	0.66
v/c Ratio	0.84	0.29	0.31	0.06	0.23	0.09	0.67	0.30	0.01	0.07	0.54	0.12
Control Delay	69.7	34.6	7.8	31.1	33.4	9.2	22.2	8.5	0.3	7.3	11.6	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.7	34.6	7.8	31.1	33.4	9.2	22.2	8.5	0.3	7.3	11.6	1.6
LOS	E	C	A	C	C	A	C	A	A	A	B	A
Approach Delay												
Approach LOS												
Intersection Summary												
Area Type:	Other											
Cycle Length: 101												
Actuated Cycle Length: 98.3												
Natural Cycle: 80												
Control Type: Semi Act-Uncoord												
Maximum v/c Ratio: 0.84												
Intersection Signal Delay: 19.9												
Intersection Capacity Utilization 88.0%												
Analysis Period (min) 60												

Splits and Phases: 3: Bank Street & Mitch Owens Road



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Synchro 8 Report

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Queues

3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Total Future 2015 SAT with improvements

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	224	109	135	16	84	33	275	358	13	46	643	132
v/c Ratio	0.84	0.29	0.31	0.06	0.23	0.09	0.67	0.30	0.01	0.07	0.54	0.12
Control Delay	69.7	34.6	7.8	31.1	33.4	9.2	22.2	8.5	0.3	7.3	11.6	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.7	34.6	7.8	31.1	33.4	9.2	22.2	8.5	0.3	7.3	11.6	1.6
Queue Length 50th (m)	41.0	17.5	0.0	2.5	13.3	0.0	31.9	28.8	0.0	3.1	64.3	0.0
Queue Length 95th (m)	#91.3	36.4	18.6	8.7	29.2	7.8	#98.2	50.3	0.7	8.3	113.1	7.9
Internal Link Dist (m)	154.9											
Turn Bay Length (m)	152.8											
Base Capacity (vph)	305	423	473	298	423	399	408	1194	1009	635	1194	1061
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.26	0.29	0.05	0.20	0.08	0.67	0.30	0.01	0.07	0.54	0.12
Intersection Summary												
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.												

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Synchro 8 Report

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HCM Signalized Intersection Capacity Analysis

3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
Total Future 2015 SAT with improvements

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	→	↗	↖	→	↗	↖	→	↗	↖	→	↗
Volume (vph)	224	109	135	16	84	33	275	358	13	46	643	132
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1722	1767	1547	1723	1767	1547	1729	1820	1517	1729	1820	1547
Flt Permitted	0.70	1.00	1.00	0.69	1.00	1.00	0.34	1.00	1.00	0.53	1.00	1.00
Satd. Flow (perm)	1274	1767	1547	1245	1767	1547	622	1820	1517	969	1820	1547
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)	224	109	135	16	84	33	275	358	13	46	643	132
RTOR Reduction (vph)	0	0	107	0	0	26	0	0	0	0	0	45
Lane Group Flow (vph)	224	109	28	16	84	7	275	358	9	46	643	87
Conf. Peds. (#/hr)	2											
Heavy Vehicles (%)	0%	3%	0%	0%	0%	3%	0%	0%	2%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm
Protected Phases	4											
Permitted Phases	4	8	4	8	8	8	2	2	2	6	6	6
Actuated Green, G (s)	20.6	20.6	20.6	20.6	20.6	20.6	64.5	64.5	64.5	64.5	64.5	64.5
Effective Green, g (s)	20.6	20.6	20.6	20.6	20.6	20.6	64.5	64.5	64.5	64.5	64.5	64.5
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.21	0.21	0.66	0.66	0.66	0.66	0.66	0.66
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	267	370	324	261	370	324	408	1195	996	636	1195	1016
v/s Ratio Prot	0.06											
v/s Ratio Perm	c0.18	0.02	0.02	0.01	0.02	0.00	c0.44	0.02	0.01	0.05	0.06	0.06
v/c Ratio	0.84	0.29	0.09	0.06	0.23	0.02	0.67	0.30	0.01	0.07	0.54	0.09
Uniform Delay, d1	37.2	32.7	31.2	31.1	32.2	30.8	10.4	7.2	5.8	6.1	8.9	6.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	23.6	0.4	0.1	0.1	0.3	0.0	9.0	0.6	0.0	0.2	1.8	0.2
Delay (s)	60.8	33.1	31.4	31.2	32.5	30.8	19.4	7.8	5.8	6.3	10.7	6.3
Level of Service	E	C	C	C	C	C	B	A	A	A	B	A
Approach Delay (s)	45.9											
Approach LOS	D											

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Synchro 8 Report

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2020 Ultimate Future Conditions

Lanes, Volumes, Timings

3: Bank Street & Mitch Owens Road

Lanes, Volumes, Timings

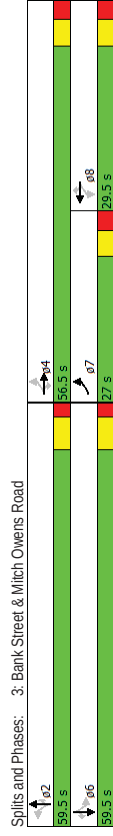
3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens

2020 Total Future AM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Volume (vph)	326	136	97	25	128	47	186	562	15	13	196	110
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00			1.00								
Fit	0.950	0.850	0.850	0.950	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850
Flt Protected												
Satd. Flow (prot)	1601	1685	1334	1616	1655	1419	1616	1717	1238	1320	1640	1218
Flt Permitted	0.435			0.670			0.634			0.305		
Satd. Flow (perm)	730	1685	1334	1135	1655	1419	1078	1717	1238	424	1640	1218
Right Turn on Red				Yes			Yes		Yes			Yes
Satd. Flow (RTOR)				97		95		60	94		60	110
Link Speed (k/h)		60			60			117.4			115.2	
Link Distance (m)		178.9			176.8			117.4			115.2	
Travel Time (s)		10.7			10.6			7.0			6.9	
Confl. Peds. (#/hr)	2			2								
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	8%	8%	16%	7%	10%	9%	7%	6%	25%	31%	11%	27%
Adj. Flow (vph)	326	136	97	25	128	47	186	562	15	13	196	110
Shared Lane Traffic (%)	326	136	97	25	128	47	186	562	15	13	196	110
Lane Group Flow (vph)												
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Link Offset(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crosswalk Width(m)	4.9			4.9			4.9				4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14	24	14	24	14	24	14	24	14	24	14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex	Ch+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7			28.7			28.7		
Detector 2 Size(m)	1.8			1.8			1.8			1.8		
Detector 2 Type	Ch+Ex			Ch+Ex			Ch+Ex			Ch+Ex		
Detector 2 Channel												
Detector 2 Extend (s)	0.0			0.0			0.0			0.0		
Turn Type	pm-pt	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	7	4		8		8	2	2	6		6	
Permitted Phases	4		4	8		8	2	2	6		6	
Detector Phase	7	4	4	8	8	8	2	2	6	6	6	6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Initial (s)	10.5	29.5	29.5	29.5	29.5	29.5	24.6	24.6	24.6	24.6	24.6	24.6
Minimum Split (s)	27.0	56.5	56.5	29.5	29.5	29.5	59.5	59.5	59.5	59.5	59.5	59.5
Total Split (s)	23.3%	48.7%	48.7%	25.4%	25.4%	25.4%	51.3%	51.3%	51.3%	51.3%	51.3%	51.3%
Total Split (%)	20.5	50.0	50.0	23.0	23.0	23.0	52.9	52.9	52.9	52.9	52.9	52.9
Maximum Green (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
Yellow Time (s)	2.8	2.8	2.8	2.8	2.8	2.8	2.0	2.0	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Total Lost Time (s)												
Lead/Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0	16.0	10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Act Effct Green (s)	39.7	39.7	39.7	13.4	13.4	13.4	53.0	53.0	53.0	53.0	53.0	53.0
Actuated g/C Ratio	0.37	0.37	0.37	0.13	0.13	0.13	0.50	0.50	0.50	0.50	0.50	0.50
v/c Ratio	0.75	0.22	0.17	0.17	0.17	0.18	0.35	0.65	0.02	0.06	0.24	0.17
Control Delay	38.3	23.1	5.0	43.7	57.2	1.8	19.3	25.2	0.1	16.5	16.9	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.3	23.1	5.0	43.7	57.2	1.8	19.3	25.2	0.1	16.5	16.9	3.8
LOS	D	C	A	D	E	A	B	C	A	B	B	A
Approach Delay		28.8			42.5			23.3			12.4	
Approach LOS		C			D			C			B	
Queue Length 50th (m)	51.9	18.7	0.0	4.7	25.5	0.0	22.6	83.9	0.0	1.4	22.4	0.0
Queue Length 95th (m)	#101.2	36.3	12.5	14.1	49.8	3.0	49.8	162.4	0.0	6.0	45.9	12.0
Internal Link Dist (m)		154.9			152.8			93.4			91.2	
Turn Bay Length (m)												
Base Capacity (vph)	442	797	682	247	360	383	539	859	666	212	821	664
Saturation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.17	0.14	0.10	0.36	0.12	0.35	0.65	0.02	0.06	0.24	0.17
Intersection Summary												
Area Type: Other												
Cycle Length: 116												
Actuated Cycle Length: 105.9												
Natural Cycle: 80												
Control Type: Semi-Ad-Uncoordinated												
Maximum v/c Ratio: 0.75												
Intersection Signal Delay: 25.1												
Intersection Capacity Utilization 82.6%												
Analysis Period (min) 60												
# 95th percentile volume exceeds capacity, queue may be longer.												
Queue shown is maximum after two cycles.												

[illegible]

HCM Signalized Intersection Capacity Analysis
3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens

2020 Total Future AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	326	136	97	25	128	47	186	562	15	13	196	110
Volume (vph)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Ideal Flow (vphpl)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1599	1685	1334	1610	1655	1419	1616	1717	1238	1320	1640	1218
Flt Permitted	0.44	1.00	1.00	0.67	1.00	1.00	0.63	1.00	1.00	0.30	1.00	1.00
Satd. Flow (perm)	732	1685	1334	1135	1655	1419	1079	1717	1238	424	1640	1218
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)	326	136	97	25	128	47	186	562	15	13	196	110
RTOR Reduction (vph)	0	0	61	0	0	41	0	0	0	7	0	55
Lane Group Flow (vph)	326	136	36	25	128	6	186	562	8	13	196	55
Conf. Peds. (#/hr)	2			2								
Heavy Vehicles (%)	8%	8%	16%	7%	10%	9%	7%	6%	25%	31%	11%	27%
Turn Type	pm-pt	7	4									
Protected Phases												
Permitted Phases	4			8			8	2	2	6		6
Actuated Green, G (s)	39.7	39.7	39.7	13.4	13.4	13.4	53.0	53.0	53.0	53.0	53.0	53.0
Effective Green, g (s)	39.7	39.7	39.7	13.4	13.4	13.4	53.0	53.0	53.0	53.0	53.0	53.0
Actuated g/C Ratio	0.38	0.38	0.38	0.13	0.13	0.13	0.50	0.50	0.50	0.50	0.50	0.50
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	436	632	500	143	209	179	540	860	620	212	821	610
v/s Ratio Prot	c0.14	0.08			0.08		c0.33				0.12	
v/s Ratio Perm	c0.14	0.03	0.02	0.02	0.00	0.17	0.00	0.17	0.01	0.03	0.05	
v/c Ratio	0.75	0.22	0.07	0.17	0.61	0.03	0.34	0.65	0.01	0.06	0.24	0.09
Uniform Delay, d1	26.3	22.5	21.2	41.3	43.7	40.5	15.9	19.6	13.3	13.6	15.0	13.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.2	0.2	0.1	0.6	5.3	0.1	1.7	3.9	0.0	0.6	0.7	0.3
Delay (s)	33.4	22.6	21.3	41.8	49.1	40.6	17.7	23.5	13.3	14.1	15.7	14.1
Level of Service	C	C	C	D	D	D	B	C	B	B	B	B
Approach Delay (s)		28.7			46.2			21.9			15.1	
Approach LOS		C			D			C			B	

Intersection Summary		
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.73	C
Actuated Cycle Length (s)	106.8	
Intersection Capacity Utilization	82.6%	E
Analysis Period (min)	60	
c. Critical Lane Group		

Lanes, Volumes, Timings
3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens

2020 Total Future PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	156	257	87	20	180	36	157	422	26	29	904	209
Volume (vph)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Ideal Flow (vphpl)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00			1.00								
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1601	1685	1334	1616	1655	1419	1616	1717	1238	1320	1640	1218
Flt Permitted	0.537			0.366			0.207			0.487		
Satd. Flow (perm)	902	1685	1334	621	1655	1419	352	1717	1238	677	1640	1218
Right Turn on Red		Yes		Yes			Yes			Yes		
Satd. Flow (RTOR)		87		36			32			209		
Link Speed (k/h)		60		60			60			115.2		
Link Distance (m)		178.9		176.8			117.4			6.9		
Travel Time (s)		10.7		10.6			7.0					
Conf. Peds. (#/hr)	2			2								
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	8%	8%	16%	7%	10%	9%	7%	6%	25%	31%	11%	27%
Adj. Flow (vph)	156	257	87	20	180	36	157	422	26	29	904	209
Shared Lane Traffic (%)												
Lane Group Flow (vph)	156	257	87	20	180	36	157	422	26	29	904	209
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	Right
Median Width(m)	3.7			3.7			3.7			3.7		
Link Offset(m)	0.0			0.0			0.0			0.0		
Crosswalk Width(m)	4.9			4.9			4.9			4.9		
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14	24	14	24	14	24	14	24	24	14	14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	ChEx	ChEx	ChEx	ChEx	ChEx	ChEx	ChEx	ChEx	ChEx	ChEx	ChEx	ChEx
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7			28.7			28.7		
Detector 2 Size(m)	1.8			1.8			1.8			1.8		
Detector 2 Type	ChEx			ChEx			ChEx			ChEx		
Detector 2 Channel												
Detector 2 Extend (s)	0.0			0.0			0.0			0.0		
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8			8			2		6
Permitted Phases	4		4	8		8	8		2	2	6	6
Detector Phase	4		4	8		8	8		2	2	6	6

Lanes, Volumes, Timings

3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens

2020 Total Future PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	29.5	29.5	29.5	29.5	29.5	29.5	24.6	24.6	24.6	24.6	24.6	24.6
Total Split (s)	34.0	34.0	34.0	34.0	34.0	34.0	86.0	86.0	86.0	86.0	86.0	86.0
Total Split (%)	28.3%	28.3%	28.3%	28.3%	28.3%	28.3%	71.7%	71.7%	71.7%	71.7%	71.7%	71.7%
Maximum Green (s)	27.5	27.5	27.5	27.5	27.5	27.5	79.4	79.4	79.4	79.4	79.4	79.4
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.8	2.8	2.8	2.8	2.8	2.8	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0	16.0	10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Act Effct Green (s)	22.9	22.9	22.9	22.9	22.9	22.9	79.5	79.5	79.5	79.5	79.5	79.5
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.20	0.20	0.69	0.69	0.69	0.69	0.69	0.69
v/c Ratio	0.88	0.77	0.26	0.16	0.55	0.12	0.36	0.03	0.03	0.06	0.80	0.23
Control Delay	101.8	61.2	9.9	41.0	48.2	12.4	28.1	9.1	2.0	7.4	21.0	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	101.8	61.2	9.9	41.0	48.2	12.4	28.1	9.1	2.0	7.4	21.0	1.6
LOS	F	E	A	D	D	B	C	A	A	A	C	A
Approach Delay		64.9			42.2			13.7			17.1	
Approach LOS		E			D			B			B	
Intersection Summary												
Area Type:	Other											
Cycle Length:	120											
Actuated Cycle Length:	115.6											
Natural Cycle:	90											
Control Type:	Semi Act-Uncoord											
Maximum v/c Ratio:	0.88											
Intersection Signal Delay:	28.3											
Intersection Capacity Utilization:	100.4%											
Analysis Period (min):	60											

Splits and Phases: 3: Bank Street & Mitch Owens Road



Queues

3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens

2020 Total Future PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	156	257	87	20	180	36	157	422	26	29	904	209
v/c Ratio	0.88	0.77	0.26	0.16	0.55	0.12	0.65	0.36	0.03	0.06	0.80	0.23
Control Delay	101.8	61.2	9.9	41.0	48.2	12.4	28.1	9.1	2.0	7.4	21.0	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	101.8	61.2	9.9	41.0	48.2	12.4	28.1	9.1	2.0	7.4	21.0	1.6
Queue Length 50th (m)	34.5	55.4	0.0	3.8	36.9	0.0	19.7	38.8	0.0	2.1	139.6	0.0
Queue Length 95th (m)	#81.2	#101.9	16.4	12.1	67.2	10.3	#75.2	68.6	3.0	6.4	#309.9	10.6
Internal Link Dist (m)		154.9			152.8			93.4				91.2
Turn Bay Length (m)												
Base Capacity (vph)	214	401	384	147	394	365	242	1181	861	485	1128	903
Saturation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.64	0.23	0.14	0.46	0.10	0.65	0.36	0.03	0.06	0.80	0.23
Intersection Summary												
# 95th percentile volume exceeds capacity, queue may be longer.												
Queue shown is maximum after two cycles.												

HCM Signalized Intersection Capacity Analysis

3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens

2020 Total Future PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	156	257	87	20	180	36	157	422	26	29	904	209
Volume (vph)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Ideal Flow (vphpl)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1595	1685	1334	1611	1655	1419	1616	1717	1238	1320	1640	1218
Flt Permitted	0.54	1.00	1.00	0.37	1.00	1.00	0.21	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)	902	1685	1334	621	1655	1419	351	1717	1238	677	1640	1218
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)	156	257	87	20	180	36	157	422	26	29	904	209
RTOR Reduction (vph)	0	0	70	0	0	29	0	0	8	0	0	65
Lane Group Flow (vph)	156	257	17	20	180	7	157	422	18	29	904	144
Conf. Peds. (#/hr)	2	2	2	2	2	2	2	2	2	2	2	2
Heavy Vehicles (%)	8%	8%	16%	7%	10%	9%	7%	6%	25%	31%	11%	27%
Turn Type	Perm	NA	Perm	NA	Perm	Perm	Perm	Perm	Perm	Perm	NA	Perm
Protected Phases	4	4	4	8	8	8	8	2	2	2	6	6
Permitted Phases	4	4	4	8	8	8	8	2	2	2	6	6
Actuated Green, G (s)	22.9	22.9	22.9	22.9	22.9	22.9	22.9	79.6	79.6	79.6	79.6	79.6
Effective Green, g (s)	22.9	22.9	22.9	22.9	22.9	22.9	22.9	79.6	79.6	79.6	79.6	79.6
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.69	0.69	0.69	0.69	0.69
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	178	333	264	123	327	281	241	1182	852	466	1129	838
v/s Ratio Prot	0.15	0.15	0.11	0.11	0.11	0.11	0.25	0.25	0.25	0.25	0.25	0.25
v/s Ratio Perm	0.17	0.17	0.13	0.13	0.13	0.13	0.45	0.45	0.45	0.45	0.45	0.45
v/c Ratio	0.88	0.77	0.07	0.16	0.55	0.03	0.65	0.36	0.02	0.06	0.80	0.17
Uniform Delay, d1	45.0	43.9	37.7	38.4	41.7	37.4	10.2	7.4	5.7	5.9	12.5	6.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	46.9	11.3	0.1	0.6	2.0	0.0	13.7	0.8	0.0	0.3	6.3	0.4
Delay (s)	91.9	55.2	37.8	39.0	43.7	37.4	23.8	8.3	5.7	6.1	18.8	6.8
Level of Service	F	E	D	D	D	D	C	A	A	A	B	A
Approach Delay (s)	63.6	63.6	42.4	42.4	42.4	42.4	12.2	12.2	12.2	12.2	16.3	16.3
Approach LOS	E	E	D	D	D	D	B	B	B	B	B	B

Intersection Summary

HCM 2000 Control Delay

HCM 2000 Volume to Capacity ratio

Actuated Cycle Length (s)

Intersection Capacity Utilization

Analysis Period (min)

c. Critical Lane Group

3/4/2014

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Synchro 8 Report

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Lanes, Volumes, Timings

3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens

2020 Total Future Sat

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	232	116	140	16	92	32	282	357	13	46	643	148
Volume (vph)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Ideal Flow (vphpl)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.950	1.000	1.000	0.950	1.000	1.000	0.950	1.000	1.000	1.000	1.000	1.000
Satd. Flow (prot)	1601	1685	1334	1616	1655	1419	1616	1717	1238	1320	1640	1218
Flt Permitted	0.697	1.000	1.000	0.682	1.000	1.000	0.682	1.000	1.000	1.000	1.000	1.000
Satd. Flow (perm)	1171	1685	1334	1156	1655	1419	1156	1717	1238	738	1640	1218
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Satd. Flow (RTOR)	60	60	60	60	60	60	60	60	60	60	60	60
Link Speed (k/h)	178.9	178.9	178.9	178.9	178.9	178.9	178.9	178.9	178.9	178.9	178.9	178.9
Link Distance (m)	10.7	10.7	10.7	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6
Travel Time (s)	2	2	2	2	2	2	2	2	2	2	2	2
Conf. Peds. (#/hr)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Peak Hour Factor	8%	8%	16%	7%	10%	9%	7%	6%	25%	31%	11%	27%
Heavy Vehicles (%)	232	116	140	16	92	32	282	357	13	46	643	148
Adj. Flow (vph)	232	116	140	16	92	32	282	357	13	46	643	148
Shared Lane Traffic (%)	232	116	140	16	92	32	282	357	13	46	643	148
Lane Group Flow (vph)	No	No	No	No	No	No	No	No	No	No	No	No
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Link Offset(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crosswalk Width(m)	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Two way Left Turn Lane	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Headway Factor	24	14	24	14	24	14	24	14	24	14	24	14
Turning Speed (k/h)	1	2	1	1	2	1	1	2	1	1	2	1
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	ChEx	ChEx	ChEx	ChEx	ChEx	ChEx	ChEx	ChEx	ChEx	ChEx	ChEx	ChEx
Detector 1 Channel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7
Detector 2 Size(m)	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Detector 2 Type	ChEx	ChEx	ChEx	ChEx	ChEx	ChEx	ChEx	ChEx	ChEx	ChEx	ChEx	ChEx
Detector 2 Channel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Perm	NA	Perm	Perm	Perm	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	4	4	4	8	8	8	8	2	2	2	6	6
Permitted Phases	4	4	4	8	8	8	8	2	2	2	6	6
Detector Phase	4	4	4	8	8	8	8	2	2	2	6	6

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Synchro 8 Report

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Lanes, Volumes, Timings

3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens

2020 Total Future Sat

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	29.5	29.5	29.5	29.5	29.5	29.5	24.6	24.6	24.6	24.6	24.6	24.6
Total Split (s)	29.5	29.5	29.5	29.5	29.5	29.5	60.5	60.5	60.5	60.5	60.5	60.5
Total Split (%)	32.8%	32.8%	32.8%	32.8%	32.8%	32.8%	67.2%	67.2%	67.2%	67.2%	67.2%	67.2%
Maximum Green (s)	23.0	23.0	23.0	23.0	23.0	23.0	53.9	53.9	53.9	53.9	53.9	53.9
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.8	2.8	2.8	2.8	2.8	2.8	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0	16.0	10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Act Effct Green (s)	20.3	20.3	20.3	20.3	20.3	20.3	54.0	54.0	54.0	54.0	54.0	54.0
Actuated g/C Ratio	0.23	0.23	0.23	0.23	0.23	0.23	0.62	0.62	0.62	0.62	0.62	0.62
v/c Ratio	0.85	0.30	0.34	0.06	0.24	0.09	0.82	0.34	0.02	0.10	0.63	0.18
Control Delay	67.8	29.6	7.4	26.2	28.6	6.5	40.5	9.7	0.1	8.4	14.8	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.8	29.6	7.4	26.2	28.6	6.5	40.5	9.7	0.1	8.4	14.8	2.0
LOS	E	C	A	C	C	A	D	A	A	A	B	A
Approach Delay		41.4			23.3			22.8			12.2	
Approach LOS		D			C			C			B	
Intersection Summary												
Area Type:	Other											
Cycle Length: 90												
Actuated Cycle Length: 87.4												
Natural Cycle: 90												
Control Type: Semi Act-Uncoord												
Maximum v/c Ratio: 0.85												
Intersection Signal Delay: 22.9	Intersection LOS: C											
Intersection Capacity Utilization 88.9%	ICU Level of Service E											
Analysis Period (min) 60												

Splits and Phases: 3: Bank Street & Mitch Owens Road



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IV

Synchro 8 Report

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Queues

3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens

2020 Total Future Sat

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	232	116	140	16	92	32	282	357	13	46	643	148
v/c Ratio	0.85	0.30	0.34	0.06	0.24	0.09	0.82	0.34	0.02	0.10	0.63	0.18
Control Delay	67.8	29.6	7.4	26.2	28.6	6.5	40.5	9.7	0.1	8.4	14.8	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.8	29.6	7.4	26.2	28.6	6.5	40.5	9.7	0.1	8.4	14.8	2.0
Queue Length 50th (m)	37.3	16.1	0.0	2.1	12.6	0.0	36.4	28.7	0.0	3.1	67.3	0.0
Queue Length 95th (m)	#87.4	34.0	17.5	7.9	28.0	6.3	#105.6	52.0	0.6	8.9	129.2	9.0
Internal Link Dist (m)		154.9		152.8				93.4			91.2	
Turn Bay Length (m)												
Base Capacity (vph)	308	443	454	304	435	406	342	1060	780	455	1013	808
Saturation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.26	0.31	0.05	0.21	0.08	0.82	0.34	0.02	0.10	0.63	0.18
Intersection Summary												
# 95th percentile volume exceeds capacity, queue may be longer.												
Queue shown is maximum after two cycles.												

3/4/2014

IV

Synchro 8 Report

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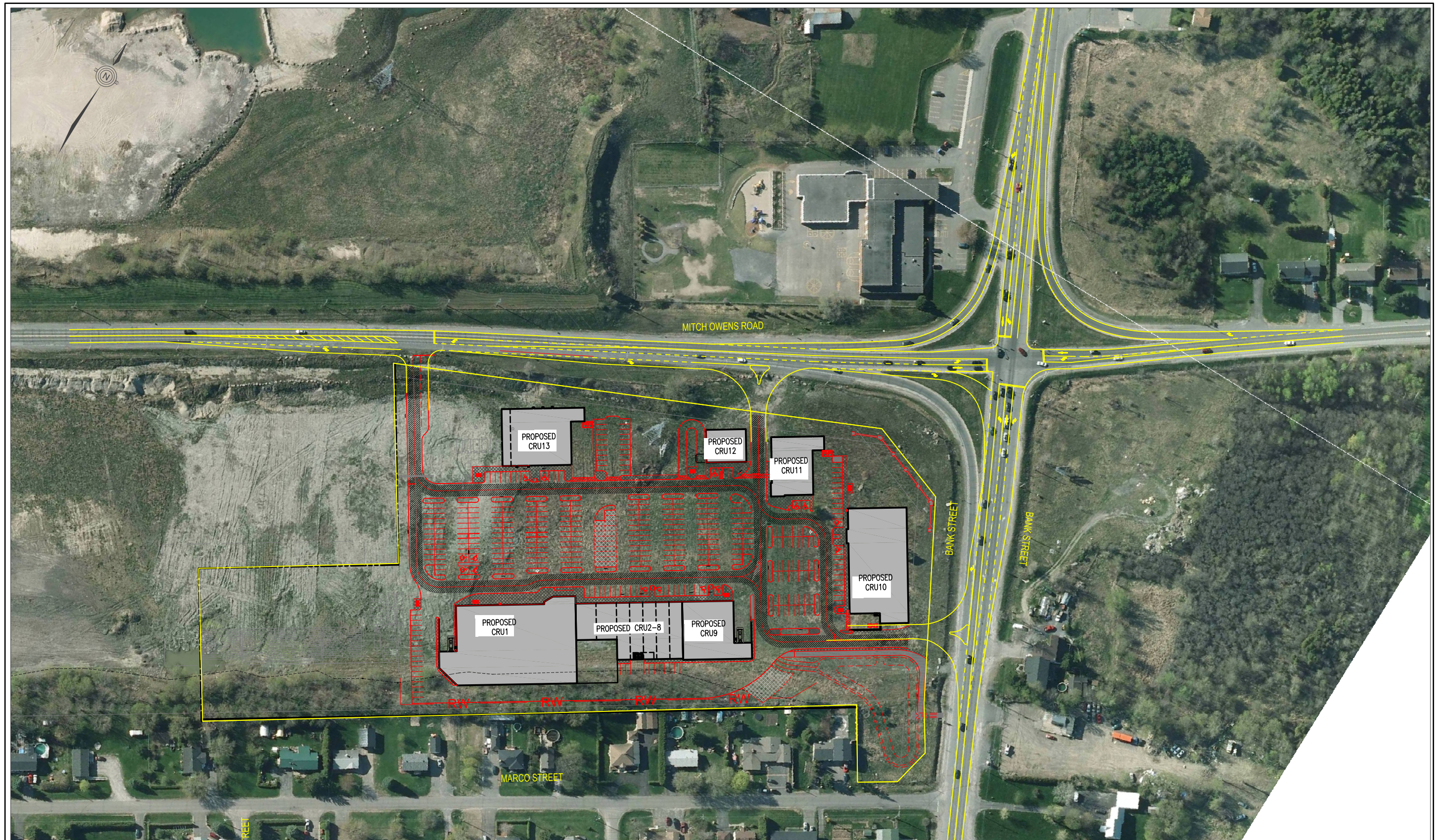
HCM Signalized Intersection Capacity Analysis
3: Bank Street & Mitch Owens Road

Bank Street @ Mitch Owens
2020 Total Future Sat

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	232	116	140	16	92	32	282	357	13	46	643
Volume (vph)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Ideal Flow (vphpl)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp. ped/bikes	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85
Frt	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1596	1685	1334	1611	1655	1419	1616	1717	1238	1320	1640
Flt Permitted	0.70	1.00	1.00	0.68	1.00	1.00	0.33	1.00	1.00	0.53	1.00
Satd. Flow (perm)	1171	1685	1334	1157	1655	1419	557	1717	1238	737	1640
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
Adj. Flow (vph)	232	116	140	16	92	32	282	357	13	46	643
RTOR Reduction (vph)	0	0	107	0	0	25	0	0	5	0	57
Lane Group Flow (vph)	232	116	33	16	92	7	282	357	8	46	643
Conf. Peds. (#/hr)	2			2							
Heavy Vehicles (%)	8%	8%	16%	7%	10%	9%	7%	6%	25%	31%	11%
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	4			8			2			6	
Permitted Phases	4			8			2			6	
Actuated Green, G (s)	20.3	20.3	20.3	20.3	20.3	20.3	54.0	54.0	54.0	54.0	54.0
Effective Green, g (s)	20.3	20.3	20.3	20.3	20.3	20.3	54.0	54.0	54.0	54.0	54.0
Actuated g/C Ratio	0.23	0.23	0.23	0.23	0.23	0.23	0.62	0.62	0.62	0.62	0.62
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	271	391	309	268	384	329	344	1060	764	455	1013
v/s Ratio Prot	0.07			0.06			0.21			0.39	
v/s Ratio Perm	0.20	0.02	0.01	0.06	0.24	0.02	0.82	0.34	0.01	0.10	0.63
v/c Ratio	0.86	0.30	0.11	0.06	0.24	0.02	0.82	0.34	0.01	0.10	0.63
Uniform Delay, d1	32.2	27.7	26.4	26.1	27.3	25.9	12.9	8.1	6.4	6.8	10.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	27.2	0.4	0.2	0.1	0.3	0.0	22.3	0.9	0.0	0.4	3.1
Delay (s)	59.3	28.1	26.6	26.2	27.6	25.9	35.2	8.9	6.4	7.3	13.6
Level of Service	E	C	C	C	C	C	D	A	A	B	A
Approach Delay (s)		42.5		27.1			20.2			12.1	
Approach LOS		D		C			C			B	
Intersection Summary											
HCM 2000 Control Delay	22.6 HCM 2000 Level of Service										
HCM 2000 Volume to Capacity ratio	0.83										
Actuated Cycle Length (s)	87.4 Sum of lost time (s)										
Intersection Capacity Utilization	88.9% ICU Level of Service										
Analysis Period (min)	60										
c. Critical Lane Group											

Figure 1 – Bank Street at Mitch Owens Road – Conceptual (without weave on Bank Street)

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Notes

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Figure No.

Figure 1

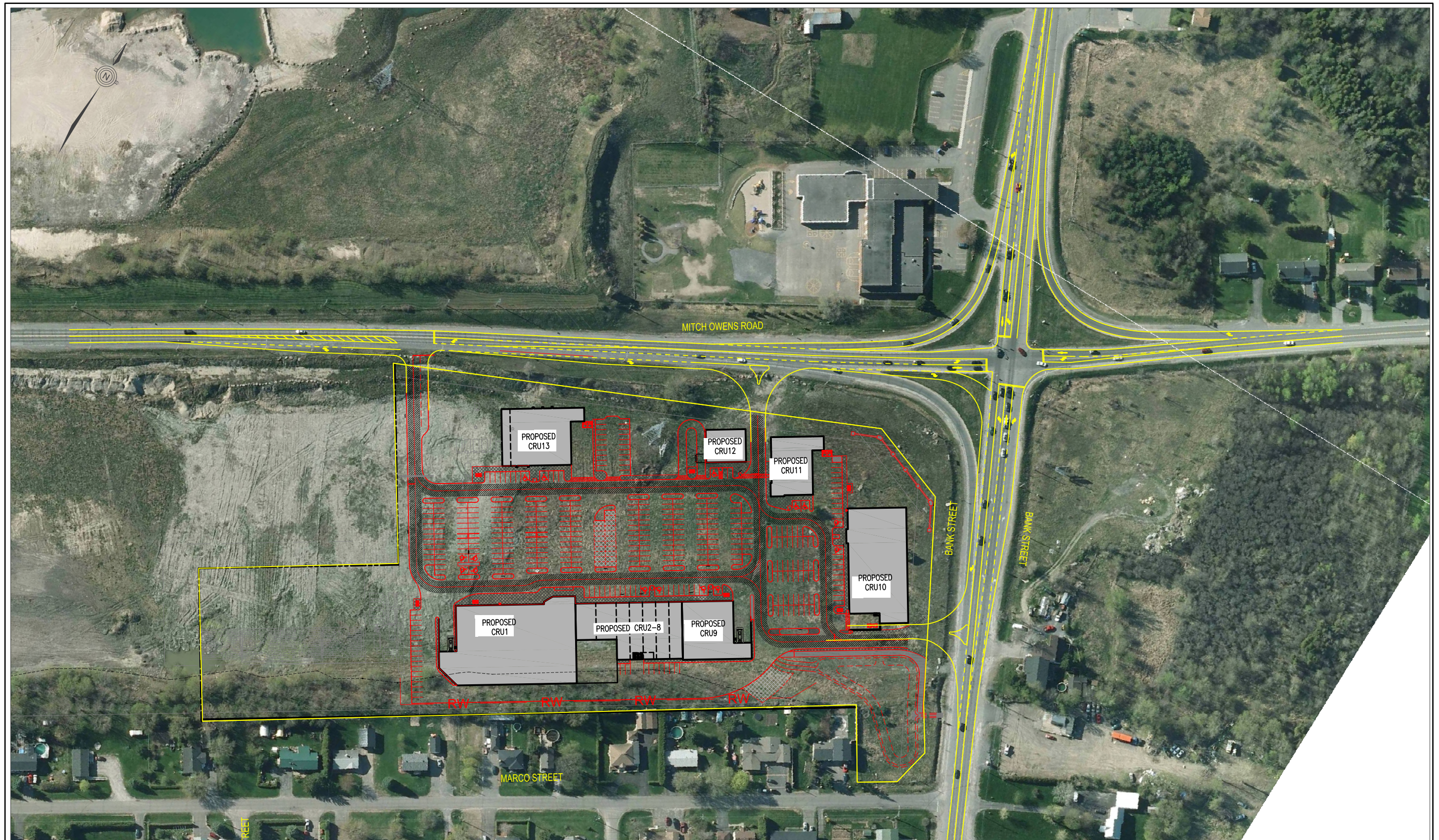
Title

Bank Street at Mitch Owens Road - Conceptual
(without weave on Bank Street)

HORIZONTAL
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**Figure 2 – Bank Street at Mitch Owens
Road – Conceptual (with weave on Bank
Street)**

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2014/02/11 9:56 AM By: MacMurray, Kevin



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Figure No.

Figure 2

Title

Bank Street at Mitch Owens Road - Conceptual
(with weave on Bank Street)

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